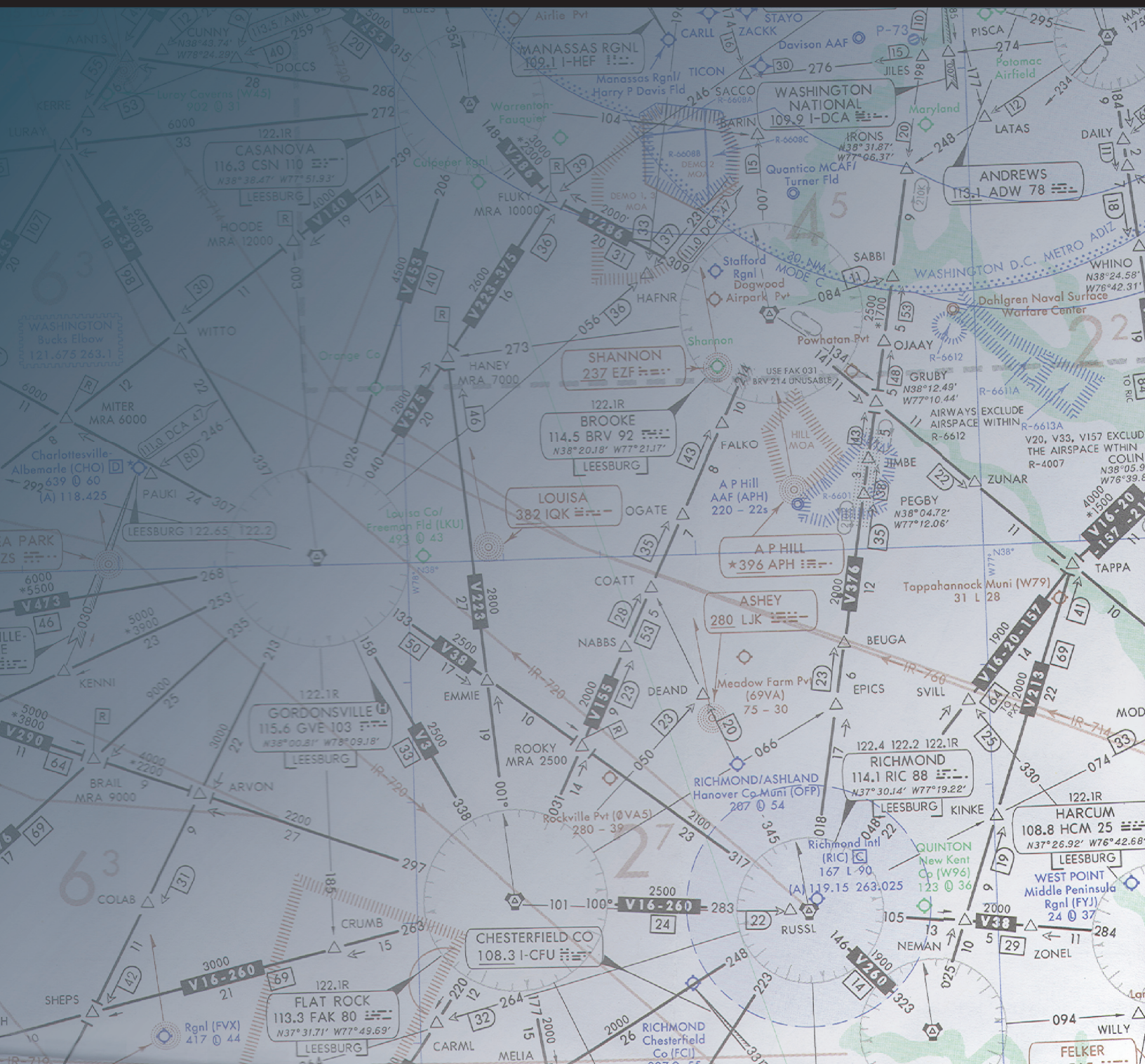
Facilities and Equipment (NAVAID) Study

prepared for

The Commonwealth of Virginia
Virginia Department of Aviation



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Study finalized July 2010

TABLE OF CONTENTS

The Table of Contents has been repeated in the front of each volume.

Chapter 1 - Introduction 1-1

Study Team 1-1

Scope of Work 1-2

Chapter 2 - Overview of the Virginia Air Transportation System 2-1

National Plan of Integrated Airport System (NPIAS) 2-1

Virginia Air Transportation System Plan (VATSP) 2-2

VATSP Airport Classification Roles 2-2

Airport Operational Data 2-6

Chapter 3 - Overview of Virginia's Instrument Approach Procedures 3-1

Ground-Based Navigation 3-1

Satellite-Based Navigation 3-3

General Categories of Instrument Approach Procedures 3-4

Understanding Landing Minimums 3-5

Commonwealth's Accessibility – All Approaches 3-6

Commonwealth's Accessibility – By Approach Type 3-11

Commonwealth's Accessibility – By Landing Minima 3-16

Chapter 4 - Equipment Inventory 4-1

NDB Systems 4-1

VOR/VORTAC Systems 4-2

Localizer and Glide Slope Systems 4-6

Approach Lighting Systems 4-7

Communication Systems 4-9

Weather Systems 4-12

Surveillance Systems 4-15

Equipment Condition Assessments 4-16

Chapter 5 - Recommendations for System-Wide Improvements..... 5-1

System Considerations 5-1

Ground-Based Navigation 5-1

Satellite-Based Approaches 5-3

Weather Reporting Systems 5-3

Surveillance Systems..... 5-4

Communication Systems 5-4

Airspace 5-4

Future Technologies 5-5

Service Level Based Recommendations 5-6

System Benchmarks..... 5-8

Impact of Improvements 5-13

Chapter 6 - Recommendations for Individual Airport Improvements..... 6-1

Review of Current Conditions 6-1

Comparison to System Benchmarks 6-2

Recommendations..... 6-2

Important Considerations..... 6-2

Proposed New Instrument Approach Procedures..... 6-5

Individual Airport Improvements..... 6-8

Accomack County Airport 6-10

Blackstone Municipal Airport 6-22

Blue Ridge Airport 6-34

Bridgewater Air Park 6-45

Brookneal-Campbell County Airport..... 6-52

Charlottesville-Albemarle Airport..... 6-61

Chase City Municipal Airport 6-77

Chesapeake Regional Airport 6-85

Chesterfield County Airport 6-96

Crewe Municipal Airport..... 6-109

Culpeper Regional Airport 6-112

Danville Regional Airport..... 6-125

Dinwiddie County Airport 6-140

Emporia-Greensville Regional Airport 6-152

Falwell Airport 6-161

Farmville Regional Airport *6-166*
Franklin Municipal Airport *6-176*
Front Royal-Warren County Airport *6-187*
Gordonsville Municipal Airport *6-195*
Grundy Municipal Airport *6-198*
Hampton Roads Executive Airport *6-204*
Hanover County Municipal *6-218*
Hummel Field *6-229*
Ingalls Field *6-235*
Lake Anna Airport *6-247*
Lawrenceville-Brunswick Airport *6-250*
Lee County Airport *6-257*
Leesburg Executive Airport *6-266*
Lonesome Pine Airport *6-279*
Louisa County Airport *6-293*
Lunenburg County Airport *6-302*
Luray Caverns Airport *6-305*
Lynchburg Regional Airport *6-317*
Manassas Regional Airport *6-332*
Marks Municipal Airport *6-350*
Mecklenburg-Brunswick Regional Airport *6-359*
Middle Peninsula Regional Airport *6-368*
Mountain Empire Airport *6-377*
New Kent County Airport *6-387*
New London Airport *6-397*
New Market Airport *6-400*
New River Valley Airport *6-403*
Newport News-Williamsburg International *6-418*
Norfolk International Airport *6-445*
Orange County Airport *6-473*
Richmond International Airport *6-483*
Roanoke Regional Airport *6-522*
Shannon Airport *6-544*
Shenandoah Valley Regional Airport *6-554*
Smith Mountain Lake Airport *6-567*

Stafford Regional Airport *6-574*
Suffolk Executive Airport *6-589*
Tangier Island Airport *6-602*
Tappahannock-Essex County Airport *6-611*
Tazewell County Airport *6-619*
Twin County Airport *6-627*
Virginia Highlands Airport *6-637*
Virginia Tech Airport *6-646*
Wakefield Municipal Airport *6-659*
Warrenton-Fauquier Airport *6-669*
Waynesboro Airport *6-679*
William M. Tuck Airport *6-682*
Williamsburg-Jamestown Airport *6-692*
Winchester Regional Airport *6-700*

Chapter 7 - Future Aeronautical Developments 7-1

The Next Generation Air Transportation System *7-1*
Surveillance Roadmap *7-2*
Navigation Roadmap *7-12*
Automation and Communications Roadmap *7-17*
Weather RoadMap *7-20*
References *7-25*

Chapter 8 – Funding Program and Priority System 8-1

Overview of Existing Funding Program *8-1*
Considerations for Funding Improvements *8-2*
Facilities and Equipment Priority System *8-2*

Chapter 9 – Implementation Plan 9-1

Categorization of Recommendations *9-1*
Currently Underway *9-1*
Near-Term Improvements (6 year plan) *9-2*
Mid-Term Improvements (10 year plan) *9-19*
Long-Term Improvements (20 year plan) *9-20*
Additional Improvements (Beyond 20 Year Planning Horizon) *9-21*
Contingent Recommendations *9-32*

Technology-Dependent Recommendations *9-35*

Recommendations Appropriate for Other Funding Programs *9-38*

Appendix A - Technical Committee **A-1**

Appendix B - Advisory Committee **B-1**

Appendix C - Inventory **C-1**

Appendix D - Weather Data **D-1**

Appendix E - Detailed Estimates **E-1**

CHAPTER 1 - INTRODUCTION

As part of continuing Virginia system planning efforts, the Virginia Department of Aviation (DOAV) Facility and Equipment (NAVAID) Study was undertaken to ensure that the Virginia system airports have appropriate approaches and the lowest practical ceiling and visibility minima.

Effective with the July 5, 2007 U.S. Terminal Procedures publication, there were 200 standard instrument approach procedures to 58 of the Commonwealth of Virginia's airports. A review found the existing system of airports to be well served with a network of federal and Commonwealth maintained NAVAID, visual guidance, communications, and weather facilities. In addition, the existing instrument approach procedures, as prepared by the Federal Aviation Administration (FAA), are well written and accurately presented.

The recommendations presented herein are intended to serve as an independent study prepared for the DOAV's review and consideration. These recommendations are not intended to take the place of individual airport master plans, environmental or capital improvement planning processes. The contents of this Study do not reflect the official views of the FAA or DOAV, nor are the FAA and DOAV endorsing the Study's recommended improvements and timelines for programming and funding.

All new navigational and lighting aids should be evaluated in accordance with FAA Order 7031.2C "Airway Planning Standard Number 1 – Terminal Air Navigation Facilities and Air Traffic Control Services, "FAA Publication FAA-APO-8310 "Establishment and Discontinuance Criteria for Precision Landing Systems" and FAA Order 5100.38C "Airport Improvement Program Handbook" regarding FAA funding eligibility.

If an airport Sponsor would like to pursue improvements contained in this Study, they should work with their representatives at the FAA Airports District Office and the DOAV to develop a mutually acceptable development program. All improvements will be required to meet FAA Airport Improvement Program (AIP) eligibility requirements if Federal AIP funding is desired.

STUDY TEAM

CONSULTANT TEAM

The Consultant Team for the Study consisted of Delta Airport Consultants, Inc. (prime consultant) and Virginia Tech.

TECHNICAL COMMITTEE

The Technical Committee for the Study was responsible for project scoping, steering and review. The Technical Committee consisted of the Consultant Team as well as representatives from the DOAV and the FAA. FAA representation included personnel from the Airports Organization, Washington Airports District Office; the Air Traffic Organization, Flight Procedures Group; and the Air Traffic Organization, Eastern Service Area, Planning and Requirements Group.

Individual members of the Technical Committee are listed in Appendix A.

ADVISORY COMMITTEE

As part of the Study, an Advisory Committee was formed as a forum for user input and participation. The Advisory Committee included representatives from many trade organizations, including: Virginia Airport Operators Council, Virginia Aviation Business Association, National Business Aircraft Association, the FAA Potomac TRACON and the DOAV Flight Operations and Safety Division.

Individual members of the Advisory Committee are listed in Appendix B.

SCOPE OF WORK

The Study was funded by the FAA's Airport Improvement Program as well as DOAV funds. As such, the Scope of Work was developed in coordination with the DOAV, the FAA and the Consultant Team. The Scope of Work consisted of six primary tasks, described as follows.

INVENTORY

An inventory of the Commonwealth and FAA-owned navigation, visual guidance, communication, and weather equipment at each of Virginia's system airports was compiled as part of the Study. Age and condition information was included, where available.

Operational data was summarized from the current Virginia Air Transportation System Plan (VATSP) and the 2007 Virginia based aircraft survey. The inventory effort also included a review of planned improvements at system airports throughout the Commonwealth.

As part of the Study, a basic Geographic Information System (GIS) database was developed to assist the Commonwealth with management of facilities.

AIRPORT MINIMA

The purpose of this task was to develop guidance for further improvement of the Commonwealth's air transportation system as it relates to navigational aid coverage, weather reporting availability, and accessibility during low minima situations. A secondary objective of this task was to develop facilities and equipment guidelines for each service-level category in the VATSP.

To complete this task, the Consultant Team reviewed existing instrument approach procedures and minima to each of the system airports in the Commonwealth and developed recommendations for both system-wide coverage as well as service-level guidelines.

RECOMMENDATIONS FOR ACHIEVING DESIRED INSTRUMENT MINIMA AND IMPROVING AIRPORT SAFETY

The purpose of this task was for the Consultant Team to review the instrument approach procedures to each of the system airports to develop recommendations to improve procedure clarity, landing minima, communications, or otherwise enhance the accessibility of the airports. Using published approaches dated July 6, 2007, the Consultant Team reviewed 194 existing procedures as part of this effort. Note that procedures for Washington Dulles International Airport and Ronald Reagan National Airport were excluded from the work scope.

A secondary purpose of this task was for the Consultant Team to recommend any new instrument approach procedures which should be considered in the Commonwealth's system. As part of the Study, the Consultant Team completed a preliminary evaluation of 22 new procedures.

AIRPORT IQ INTEGRATION

This task served to provide for the integration of information from the Study into the Commonwealth's existing Airport IQ System. The Consultant Team utilized information obtained during the Study to populate the appropriate standard and custom fields for the Commonwealth.

IDENTIFY FUTURE DEVELOPMENTS

The purpose of this portion of the Study was to develop an aviation communication, navigation and surveillance system roadmap to help ensure that future aviation users receive an adequate level of service and, at the same time, the Commonwealth invests wisely in future systems.

The scope included a review of the five critical FAA roadmaps that could affect development and deployment decisions at the Commonwealth level. The reviewed roadmaps included: Automation, Communications, Navigation, Surveillance and Weather. The Team then developed strategies to synchronize the FAA roadmap with the best interests of the Commonwealth, considering commissioning and decommissioning of facilities and equipment, policy changes and funding streams.

IMPLEMENTATION PLAN

There were two primary objectives of the Implementation Plan portion of the scope. The first was to develop a system which could be used to prioritize the recommendations generated throughout the Study. The second was a comprehensive implementation plan – considering both schedule and budget – that could be used to guide the Commonwealth in future planning and programming efforts.

The priority system sought to ensure that the DOAV is able to quantitatively evaluate the relative importance of recommended improvements to communication, navigation and surveillance systems across the Commonwealth. Both benefits and costs were factored into the system.

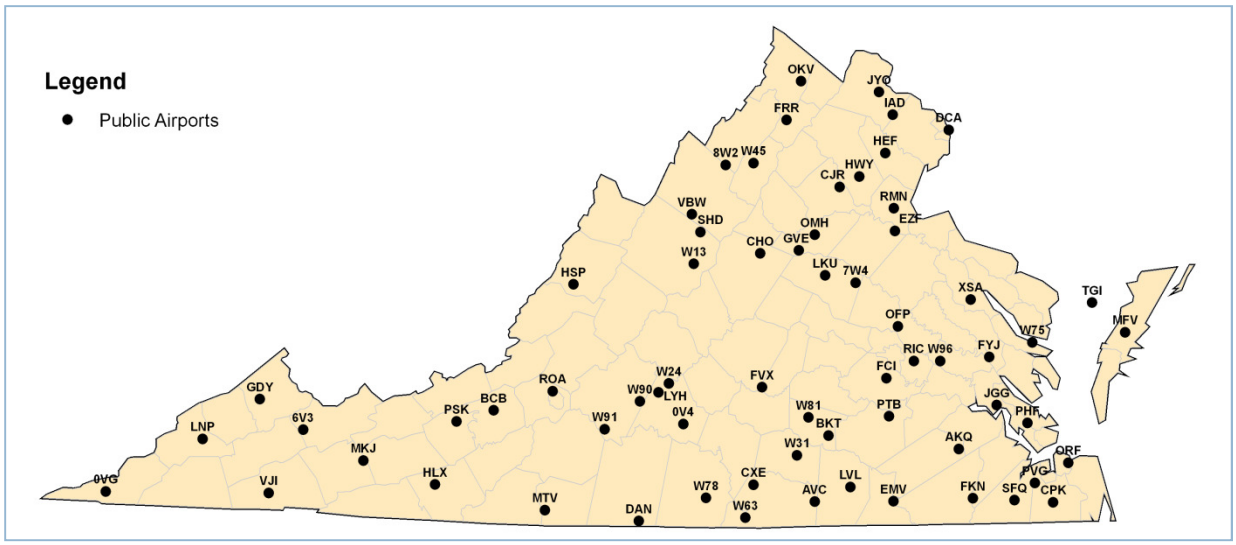
The comprehensive implementation plan was mapped out using near-term (until 2014), mid-term (until 2018) and long term (until 2028) planning horizons.

CHAPTER 2 - OVERVIEW OF THE VIRGINIA AIR TRANSPORTATION SYSTEM

This Study, the Virginia Facility and Equipment (NAVAID) Study, is designed to complement and be used in conjunction with the existing *National Plan of Integrated Airport Systems* (NPIAS) published by the Federal Aviation Administration (FAA) as well as the *Virginia Air Transportation System Plan* (VATSP) published by the Commonwealth of Virginia's Department of Aviation (DOAV).

There are 66 public use airports in the Commonwealth of Virginia, as depicted on the following figure.

Figure 2-1 – Public Use Airports



source: Figure developed by consultant for Study

NATIONAL PLAN OF INTEGRATED AIRPORT SYSTEM (NPIAS)

The *National Plan of Integrated Airport Systems* is the FAA's plan for the development of public-use airports in the United States. The national system is structured to provide most communities with access to a safe and adequate airport.

Forty eight of the public-use airports in the Commonwealth of Virginia are included in the FAA NPIAS. The Virginia airports in the Plan have been categorized into the following classifications:

Airports with Scheduled Passenger Service

Commercial Service (CS): airports receiving scheduled passenger service and having 2,500 or more annual enplanements

Primary (PR): commercial service airports having 10,000 or more enplanements

General Aviation System

General Aviation (GA): airports with no scheduled passenger service or those receiving scheduled service but having less than 2,500 annual enplanements

Reliever (RL): high capacity general aviation airports in major metropolitan areas

Of Virginia's nine airports with scheduled passenger service, eight are classified as NPIAS Primary Airports. In addition, eight of the general aviation airports are designated as NPIAS Reliever facilities.

VIRGINIA AIR TRANSPORTATION SYSTEM PLAN (VATSP)

The latest *Virginia Air Transportation System Plan* (2003) reviewed the Commonwealth's system of airports and provided an assessment of the System's strengths and weaknesses as well as recommendations for the future. Specifically, the report grouped each of the Commonwealth's public use airports into an Airport Classification Role and also developed operational forecasts for 2020. The two data elements are used throughout this NAVAID Study and are presented in this chapter.

VATSP AIRPORT CLASSIFICATION ROLES

The 2003 VATSP identified five distinct Airport Classification Roles and defined them as follows:

Commercial Service (CS): These airports provide scheduled commuter and/or air carrier service to surrounding communities.

Reliever (RL): These airports provide alternative general aviation facilities to reduce congestion at commercial service airports. These airports typically have 50 or more based aircraft and 25,000+ annual operations, including jet operations.

GA – Regional (GR): These airports provide a full range of aviation facilities and services to business and recreational users in a broad market area. Service areas are often multijurisdictional due to geographic isolation or the relative scarcity of other airport services and facilities. These airports typically have 25 or more based aircraft and 10,000+ annual operations, including jet operations.

GA – Community (GC): These airports provide general aviation facilities and services to business and recreational users. Community airports typically serve a limited market area. These airports typically have 10 or more based aircraft and 5,000+ annual operations, including limited jet operations.

Local Service (LO): These airports provide limited facilities to their respective communities. These airports typically have low activity levels and the System Plan notes that "substantial expansion is typically precluded by development constraints such as airspace conflicts, environmental concerns, topography, competing services, surrounding land use patterns and ownership status."

Table 2-1 – VATSP Classifications, by Airport Name

Airport Name	Identifier	VATSP Classification
Accomack County	MFV	GA - Regional
Blackstone Municipal	BKT	GA - Community
Blue Ridge	MTV	GA - Regional
Bridgewater Air Park	VBW	Local Service
Brookneal-Campbell County	0V4	GA - Community
Charlottesville-Albemarle	CHO	Commercial Service
Chase City Municipal	CXE	Local Service
Chesapeake Regional	CPK	Reliever
Chesterfield County	FCI	Reliever
Crewe Municipal	W81	Local Service
Culpeper Regional	CJR	GA - Regional
Danville Regional	DAN	GA - Regional
Dinwiddie County	PTB	GA - Regional
Emporia-Greensville Regional	EMV	GA - Regional
Falwell	W24	Local Service
Farmville Regional	FVX	GA - Regional
Franklin Municipal	FKN	GA - Community
Front Royal-Warren County	FRR	GA - Community
Gordonsville Municipal	GVE	Local Service
Grundy Municipal	GDY	Local Service
Hampton Roads Executive	PVG	Reliever
Hanover County Municipal	OFP	Reliever
Hummel Field	W75	Local Service
Ingalls Field	HSP	GA - Regional
Lake Anna	7W4	Local Service
Lawrenceville-Brunswick	LVL	Local Service
Lee County	0VG	GA - Community
Leesburg Executive	JYO	Reliever
Lonesome Pine	LNP	GA - Regional
Louisa County	LKU	GA - Community
Lunenburg County	W31	Local Service
Luray Caverns	W45	GA - Community
Lynchburg Regional	LYH	Commercial Service
Manassas Regional	HEF	Reliever
Marks Municipal	W63	GA - Community
Mecklenburg-Brunswick Regional	AVC	GA - Regional
Middle Peninsula Regional	FYJ	GA - Regional
Mountain Empire	MKJ	GA - Regional
New Kent County	W96	GA - Community
New London	W90	Local Service
New Market	8W2	Local Service
New River Valley	PSK	GA - Regional
Newport News-Williamsburg Int'l	PHF	Commercial Service
Norfolk International	ORF	Commercial Service
Orange County	OMH	GA - Community

Airport Name	Identifier	VATSP Classification
Richmond International	RIC	Commercial Service
Roanoke Regional	ROA	Commercial Service
Ronald Reagan Washington National	DCA	Commercial Service
Shannon	EZF	GA - Community
Shenandoah Valley Regional	SHD	Commercial Service
Smith Mountain Lake	W91	Local Service
Stafford Regional	RMN	Reliever
Suffolk Executive	SFQ	GA - Regional
Tangier Island	TGI	GA - Community
Tappahannock-Essex County	XSA	GA - Regional
Tazewell County	6V3	GA - Regional
Twin County	HLX	GA - Community
Virginia Highlands	VJI	GA - Regional
Virginia Tech	BCB	GA – Community
Wakefield Municipal	AKQ	GA - Community
Warrenton-Fauquier	HWY	Reliever
Washington Dulles International	IAD	Commercial Service
Waynesboro	W13	Local Service
William M. Tuck	W78	GA - Regional
Williamsburg-Jamestown	JGG	GA - Community
Winchester Regional	OKV	GA - Regional

source: 2003 VATSP

Table 2-2 – VATSP Airports, by Classification

Airport Name	Identifier	VATSP Classification
Charlottesville-Albemarle	CHO	Commercial Service
Lynchburg Regional	LYH	Commercial Service
Newport News-Williamsburg Int'l	PHF	Commercial Service
Norfolk International	ORF	Commercial Service
Richmond International	RIC	Commercial Service
Roanoke Regional	ROA	Commercial Service
Ronald Reagan Washington National	DCA	Commercial Service
Shenandoah Valley Regional	SHD	Commercial Service
Washington Dulles International	IAD	Commercial Service
Chesapeake Regional	CPK	Reliever
Chesterfield County	FCI	Reliever
Hampton Roads Executive	PVG	Reliever
Hanover County Municipal	OFP	Reliever
Leesburg Executive	JYO	Reliever
Manassas Regional	HEF	Reliever
Stafford Regional	RMN	Reliever
Warrenton-Fauquier	HWY	Reliever
Accomack County	MFV	GA - Regional
Blue Ridge	MTV	GA - Regional

Airport Name	Identifier	VATSP Classification
Culpeper Regional	CJR	GA - Regional
Danville Regional	DAN	GA - Regional
Dinwiddie County	PTB	GA - Regional
Emporia-Greensville Regional	EMV	GA - Regional
Farmville Regional	FVX	GA - Regional
Ingalls Field	HSP	GA - Regional
Lonesome Pine	LNP	GA - Regional
Mecklenburg-Brunswick Regional	AVC	GA - Regional
Middle Peninsula Regional	FYJ	GA - Regional
New River Valley	PSK	GA - Regional
Mountain Empire	MKJ	GA - Regional
Suffolk Executive	SFQ	GA - Regional
Tappahannock-Essex County	XSA	GA - Regional
Tazewell County	6V3	GA - Regional
Virginia Highlands	VJI	GA - Regional
William M. Tuck	W78	GA - Regional
Winchester Regional	OKV	GA - Regional
Blackstone Municipal	BKT	GA - Community
Brookneal-Campbell County	0V4	GA - Community
Franklin Municipal	FKN	GA - Community
Front Royal-Warren County	FRR	GA - Community
Lee County	0VG	GA - Community
Louisa County	LKU	GA - Community
Luray Caverns	W45	GA - Community
Marks Municipal	W63	GA - Community
New Kent County	W96	GA - Community
Orange County	OMH	GA - Community
Shannon	EZF	GA - Community
Tangier Island	TGI	GA - Community
Twin County	HLX	GA - Community
Virginia Tech	BCB	GA - Community
Wakefield Municipal	AKQ	GA - Community
Williamsburg-Jamestown	JGG	GA - Community
Bridgewater Air Park	VBW	Local Service
Chase City Municipal	CXE	Local Service
Crewe Municipal	W81	Local Service
Falwell	W24	Local Service
Gordonsville Municipal	GVE	Local Service
Grundy Municipal	GDY	Local Service
Hummel Field	W75	Local Service
Lake Anna	7W4	Local Service
Lawrenceville-Brunswick	LVL	Local Service
Lunenburg County	W31	Local Service

Airport Name	Identifier	VATSP Classification
New London	W90	Local Service
New Market	8W2	Local Service
Smith Mountain Lake	W91	Local Service
Waynesboro	W13	Local Service

source: 2003 VATSP

AIRPORT OPERATIONAL DATA

When evaluating the role of an airport in the air transportation system, it is important to have an understanding of the level of activity at a given facility. Two types of aircraft data are traditionally used in airport planning to gain this understanding. These include the number of aircraft based at the facility as well as an estimate of annual aircraft operations.

The 2003 VATSP identified operational forecasts for the year 2020. These are shown here, in conjunction with the latest based aircraft counts on record with the DOAV (submitted January, 2007).

Table 2-3 – Airport Operational Data

Airport Name	Identifier	Based Aircraft (2007)	Forecast Operations (2020)
Accomack County	MFV	24	20,194
Blackstone Municipal	BKT	11	4,531
Blue Ridge	MTV	60	25,392
Bridgewater Air Park	VBW	42	12,877
Brookneal-Campbell County	0V4	0	834
Charlottesville-Albemarle	CHO	94	128,468
Chase City Municipal	CXE	5	3,337
Chesapeake Regional	CPK	122	39,963
Chesterfield County	FCI	138	66,689
Crewe Municipal	W81	14	4,999
Culpeper Regional	CJR	129	83,479
Danville Regional	DAN	44	23,083
Dinwiddie County	PTB	71	54,694
Emporia-Greensville Regional	EMV	6	1,246
Falwell	W24	27	10,273
Farmville Regional	FVX	34	14,232
Franklin Municipal	FKN	25	6,237
Front Royal-Warren County	FRR	54	18,710
Gordonsville Municipal	GVE	12	13,337
Grundy Municipal	GDY	11*	4,993
Hampton Roads Executive	PVG	221	72,399
Hanover County Municipal	OFP	117	41,116

Airport Name	Identifier	Based Aircraft (2007)	Forecast Operations (2020)
Hummel Field	W75	64	23,861
Ingalls Field	HSP	4	8,827
Lake Anna	7W4	2	417
Lawrenceville-Brunswick	LVL	3	3,754
Lee County	0VG	11	8,091
Leesburg Executive	JYO	267	133,359
Lonesome Pine	LNP	27	10,636
Louisa County	LKU	55	33,892
Lunenburg County	W31	1	417
Luray Caverns	W45	15	3,754
Lynchburg Regional	LYH	88	86,993
Manassas Regional	HEF	431	168,298
Marks Municipal	W63	4	1,668
Mecklenburg-Brunswick Regional	AVC	19	13,076
Middle Peninsula Regional	FYJ	24	25,077
Mountain Empire	MKJ	28	11,159
New Kent County	W96	41	16,489
New London	W90	74	41,955
New Market	8W2	34	18,724
New River Valley	PSK	33	9,995
Newport News-Williamsburg Int'l	PHF	118	278,056
Norfolk International	ORF	99	178,257
Orange County	OMH	40	9,171
Richmond International	RIC	75	214,391
Roanoke Regional	ROA	113	146,473
Ronald Reagan Washington National	DCA	0	333,342
Shannon	EZF	109*	62,367
Shenandoah Valley Regional	SHD	77	31,244
Smith Mountain Lake	W91	10*	5,402
Stafford Regional	RMN	19	30,798
Suffolk Executive	SFQ	85	51,720
Tangier Island	TGI	0	1,000
Tappahannock-Essex County	XSA	13**	14,359
Tazewell County	6V3	9	5,515
Twin County	HLX	12	12,084
Virginia Highlands	VJI	68	26,061
Virginia Tech	BCB	40	20,779
Wakefield Municipal	AKQ	26	23,993
Warrenton-Fauquier	HWY	119	51,488
Washington Dulles International	IAD	59	804,356
Waynesboro	W13	54*	13,542
William M. Tuck	W78	22	7,925
Williamsburg-Jamestown	JGG	62	35,074

	Identifier	Based Aircraft (2007)	Forecast Operations (2020)
Winchester Regional	OKV	122	50,429

source: 2003 VATSP and information provided by the Virginia Department of Aviation
**2007 data unavailable; 2008 data used for table*
*** Data for Tappahannock-Essex County Airport applies to former airport.*

For airports with scheduled commercial air service, another indicator of aviation activity is the number of annual passenger enplanements at a given facility. An enplanement is defined as an embarking of an air-carrier passenger.

The 2003 VATSP identified enplanement forecasts for the year 2020. This enplanement information is shown below.

Table 2-4 – Enplanement Data

Airport Name	Identifier	Forecast Enplanements (2020)
Charlottesville-Albemarle	CHO	274,910
Lynchburg Regional	LYH	119,094
Newport News-Williamsburg Int'l	PHF	384,880
Norfolk International	ORF	3,823,698
Richmond International	RIC	3,062,572
Roanoke Regional	ROA	555,414
Ronald Reagan Washington National	DCA	7,875,373
Shenandoah Valley Regional	SHD	38,398
Washington Dulles International	IAD	27,745,900

source: VATSP page 66, Table 3

CHAPTER 3 - OVERVIEW OF VIRGINIA'S INSTRUMENT APPROACH PROCEDURES

An instrument approach procedure (IAP) is a flight procedure that provides a transition from the en-route flight environment to a point from which a safe, normal landing can be accomplished. U.S. Civil Standard Instrument Approach Procedures are designed and approved for public use by the Federal Aviation Administration (FAA) and are unique to each airport, each runway end and each procedure.

While these procedures can be flown during good weather conditions, the instrument approach procedures are especially important during instrument meteorological conditions (IMC). When the cloud ceilings are low or visibility is minimal, all flights must follow instrument flight rules (IFR) and, therefore, must utilize published instrument approach procedures when transitioning to the landing environment. The FAA has established ceiling and visibility minimums for each individual approach procedure.

It is desirable to have an instrument approach procedure with the lowest possible ceiling and visibility minimums while still maintaining safety. The lower the landing minimums, the more accessible and useful the airport is during adverse weather conditions.

Standard instrument approach procedures are constructed using guidance from either an on-airport or nearby electronic navigational aid (NAVAID) or using the Global Positioning System (GPS) which provides satellite navigation capabilities. Quite simply, the type and name of the procedure is derived from the underlying navigation equipment or system.

GROUND-BASED NAVIGATION

A NAVAID is any visual or electronic device, airborne or on the surface, which provides point-to-point guidance information or position data to aircraft in flight. Traditional NAVAIDs that form the basis for instrument approach procedures include the following:

- Non Directional Beacon (NDB) — a low or medium (190 to 535 kHz) frequency radio beacon which transmits non directional signals whereby the pilot of a properly equipped aircraft can determine bearings and "home" in on the station.

- VHF Omni-Directional Range (VOR) – VORs operate within the 108.0 to 117.95 MHZ frequency band and have a power output necessary to provide coverage within their assigned service volume. They are subject to line-of-sight restrictions, and the range varies proportionally to the altitude of the receiving equipment.

- Distance Measuring Equipment (DME) – Operating on the line-of-sight principle, DME furnishes distance information with a high degree of accuracy. Distance information received from DME equipment is slant range distance and not horizontal distance to the station. DME is typically collocated with other NAVAIDs and supplements instrument approach procedures.

- VORTAC – A VORTAC is a facility consisting of two components, VOR and TACAN. TACAN is a navigational system developed for use by the military and naval forces. Although technically and theoretically different, a VORTAC is functionally the same as a VOR/DME as far as the civilian pilot is concerned.

- Marker Beacons – Marker beacons serve to identify a particular location in space along an airway or on the approach to an instrument runway.

- Instrument Landing Systems (ILS) – The ILS is designed to provide an approach path for exact alignment and descent of an aircraft on final approach to a runway. The ground equipment consists of two highly directional transmitting systems: the localizer and the glide slope. The Localizer (LOC) provides horizontal course guidance and the glide slope provides vertical descent guidance. Marker beacons are frequently installed along the approach path to provide range guidance. Compass locators (NDBs) located at the Outer Marker (OM) or the Middle Marker (MM) may be substituted for marker beacons. In addition, DME, when specified in the procedure, may be substituted for the OM.

  There are three general classifications of ILS approaches — CAT I, CAT II, and CAT III (autoland). The basic ILS approach is a CAT I approach and requires only that pilots be instrument rated and current, and that the aircraft be equipped appropriately.

  CAT II and CAT III ILS approaches require additional facilities including runway centerline lights, runway touchdown zone lights and a high-intensity approach lighting system such as an ALSF-2. In addition, Special Aircrew and Aircraft Requirements (SAAR) restrict the use of CAT II and CAT III procedures to pilots who have received specific training and aircraft that are equipped and authorized to conduct these approaches. The lowest authorized ILS minimums, with all required ground and airborne systems components operative, are:

CAT I:	Decision Height of 200 feet Runway Visual Range (RVR) of 2,400 feet (with touchdown zone and centerline lighting, RVR 1800 feet)
CAT II:	Decision Height of 100 feet Runway Visual Range (RVR) of 1,200 feet
CAT IIIa:	Decision Height below 100 feet (or no Decision Height) Runway Visual Range (RVR) of not less than 700 feet
CAT IIIb:	Decision Height below 50 feet (or no Decision Height) Runway Visual Range (RVR) of less than 700 feet but not less than 150 feet
CAT IIIc:	No Decision Height No Runway Visual Range (RVR) limitation

SATELLITE-BASED NAVIGATION

In its purest form, the Global Positioning System (GPS) is a system of satellites which allows for the calculation of an aircraft's position in space. In order to increase the accuracy of the positioning calculations, the FAA has embarked on two programs termed WAAS and LAAS. WAAS refers to wide area augmentation system and LAAS refers to local area augmentation system. Each of these systems, with their associated technological advances, improves the usability of satellite navigation for the air transportation system.

WAAS is a navigation service using a combination of GPS satellites and the WAAS geostationary satellites to improve the navigational service provided by GPS. The WAAS program is well underway with many procedures already in place. WAAS achieved initial operating capability in 2003 and achieved full operating capability in 2008. The system is owned and operated by the FAA and provided free of direct user charges to users across the U.S. and most of Canada and Mexico.

Like WAAS, LAAS relies on GPS for basic navigation signals. However, with WAAS, GPS-corrected navigation signals come from space. With LAAS, the GPS-corrected navigation signal is broadcast from a LAAS VHF data broadcast transmitter at or near the airport. LAAS is still under development, but when implemented is widely expected to provide the greatest accuracy of all satellite based procedures.

When the civil aviation community first began using the GPS, many existing instrument approaches were modified to allow pilots with GPS capabilities to fly an existing published approach using their approved GPS capabilities instead of the more traditional NAVAIDs. This type of approach was commonly refered to as a GPS "Overlay" approach and was published as an "OR GPS" approach. This type of procedure did not require any modifications to the existing "base" published procedure. Most of these procedures have been replaced; however, several do remain throughout the Commonwealth's system. Phase out of these remaining procedures is expected in the near-term.

In addition to the GPS "Overlay" approaches, GPS "Stand Alone" approaches were developed as well. This type of approach was not related to any traditional navigational aid. Instead, they relied solely on the satellite system for navigational guidance. The terminology has been changed and the majority of these procedures have been renamed. However, as with the "Overlay" approaches, several do remain within the system and renaming is expected in the near-term.

Today, instrument approach procedures that rely on satellite navigation are referred to as RNAV (GPS) approaches, where RNAV is an acronym for Area Navigation.

In fact, the vast majority of *new* procedures developed by the FAA fall into this category. RNAV (GPS) approach charts presently can have several lines of approach minimums including LPV, LNAV/VNAV, and LNAV.

- LPV — LPV stands for localizer performance with vertical guidance. This type of approach takes advantage of WAAS to provide both electronic lateral and vertical guidance capability. On-board WAAS avionics equipment approved for LPV approaches is required for this type of approach.

- LP — An LP approach is similar to the LPV approach but does not include vertical guidance. On-board WAAS avionics equipment approved for LP approaches is required for this type of approach.

- LNAV/VNAV — LNAV/VNAV stands for lateral navigation and vertical navigation. This type of procedure provides both lateral and vertical information in the approach environment. On-board baro or WAAS equipment approved for this type of approach is required.

- LNAV — LNAV stands for lateral navigation. These approaches provide only lateral guidance information. On-board equipment is required.

A final type of satellite-based approach procedure is referred to as a RNP procedure where RNP stands for Required Navigation Performance. RNP, a refinement of RNAV, is a part of a collaborative effort by the FAA and the aviation industry to develop performance-based procedures. RNP is a statement of the navigation performance necessary for operation within defined airspace. The operational advantages of RNP include accuracy and integrity monitoring, which provide more precision and lower minimums than conventional RNAV. Besides lower minimums, the benefits of RNP include improved obstacle clearance limits, as well as reduced pilot workload. Curved flight tracks (radius-to-fix legs) are allowed as part of RNP procedures and allow the aircraft to avoid critical areas of terrain or conflicting airspace. Currently, all RNP procedures require special aircraft and aircrew authorization.

GENERAL CATEGORIES OF INSTRUMENT APPROACH PROCEDURES

There are three general categories of instrument approach procedures. Since all instrument approach procedures provide horizontal guidance, the distinction is made based on the type of vertical guidance that the procedure provides.

- Nonprecision Approach (NPA) — an instrument approach based on a navigation system that provides course deviation information but no glidepath deviation information is considered a NPA procedure. VOR, TACAN, LNAV, LP, NDB, LOC and ASR approaches are examples of nonprecision approach procedures.

- Approach with Vertical Guidance (APV) — an instrument approach based on a navigation system that is not required to meet the precision approach standards but provides course and glidepath deviation information. RNAV LPV and LNAV/VNAV procedures are examples of approaches with vertical guidance.

- Precision Approach (PA) — an instrument approach based on a navigation system that provides course and glidepath deviation information meeting precision standards. An ILS procedure is an example of a precision approach procedure.

When the LAAS program is fully functional, there will be an additional type of precision approach available to pilots: the GLS. The GLS stands for the GNSS Landing System where GNSS represents the Global Navigation Satellite System. GLS procedures are expected to be charted separately once available for use. *Although GLS minima lines appear on select RNAV approach charts, the line is intended as a placeholder only and should be replaced with LPV minima once LPV minima are available for that particular approach procedure.*

UNDERSTANDING LANDING MINIMUMS

Two types of weather minima are associated with each published instrument approach procedure. They include visibility and ceiling minima. Approach minimums are published for different aircraft categories and consist of a minimum altitude and required visibility. These minima are determined by applying the appropriate FAA criteria.

On occasion, multiple sets of minima may be published for the same approach procedure. For example:

- On ILS procedures, a second set of minima is typically published in the event the glide slope is unavailable and the pilot must rely solely on the localizer for guidance.
- On a nonprecision approach when a step-down fix is incorporated, two sets of minima may be published: one for the pilot that is able to identify the fix, and a second for the pilot that cannot.
- When a second altimeter source may be used for the procedure, two sets of minima may be published.
- When LPV, LNAV/VNAV and LNAV equipment each may be used for a RNAV procedure, multiple sets of minima will be published.
- When a circling procedure is authorized in addition to a straight-in approach, two sets of minima may be published.

CEILING MINIMA

The published Minimum Descent Altitude (MDA) or Decision Altitude (DA) is the lowest altitude that a pilot can descend to on an instrument approach procedure and be assured obstacle clearance. An MDA is published for nonprecision approaches and a DA is published for precision approaches and approaches with vertical guidance. MDAs and DAs are published in MSL (mean sea level). Upon reaching MDA or DA, the pilot may only execute a landing if the landing environment is in sight and the pilot can safely complete a normal landing.

The Height Above Touchdown (HAT) is the height of the MDA or DA above the highest runway elevation in the first 3,000 feet of the runway. HATs are published for straight-in procedures. The Height Above Airport (HAA) is the height of the MDA above the published airport elevation. HAAs are published for circling procedures.

VISIBILITY MINIMA

There are three methods for reporting visibility: prevailing visibility, runway visibility value, and runway visual range.

- Prevailing visibility is the horizontal distance over which objects or bright lights can be seen and identified over at least half of the horizon circle. Prevailing visibility is reported in statute miles or fractions of miles.

- Runway visibility value (RVV) is the distance down the runway that a pilot can see unlighted objects. It is reported in statute miles for individual runways. RVV, is derived from a transmissometer for a particular runway. When available, RVV is used in lieu of prevailing visibility in determining specific runway minimums.

- Runway visual range (RVR) is an instrumentally derived value, based on standard calibrations, that represents the horizontal distance a pilot will see down the runway from the approach end. It is based on the sighting of either high intensity runway lights or on the visual contrast of other targets whichever yields the greater visual range. RVR, in contrast to prevailing or runway visibility, is based on what a pilot in a moving aircraft should see looking down the runway. RVR is reported in hundreds of feet. Transmissometers near the runway measure visibility for the RVR report. If multiple transmissometers are installed, they provide reports for multiple locations, including touchdown RVR, mid-RVR, and rollout RVR. When available, RVR is reported in lieu of RVV or prevailing vibility.

The visibility published on an approach chart is dependent on many variables, including HAT and HAA. Other factors include the approach light system coverage, and type of approach procedure, such as precision, nonprecision, circling or straight-in. Obstructions to the close-in approach surfaces can also impact published visibility minima.

COMMONWEALTH'S ACCESSIBILITY – ALL APPROACHES

As of July 5, 2007, there were 200 published instrument approach procedures to the Commonwealth's public use airports. Fifty-nine of the 66 public use airports currently have procedures which allow access to the airport during adverse weather conditions. The procedures are tabulated below and include landing minimums for Category B operations.

Table 3-1 – Instrument Approaches to Virginia Airports

Airport Name	ID	Approach	Version	HAT or HAA	Visibility (sm or RVR)
Accomack County	MFV	RNAV (GPS) RWY 3	Orig	393	1
Accomack County	MFV	LOC RWY 3	Orig	353	1
Accomack County	MFV	VOR/DME RWY 3	Amdt 1	393	1.25
Blackstone Municipal	BKT	RNAV (GPS) RWY 4	Orig	511	1
Blackstone Municipal	BKT	RNAV (GPS) RWY 22	Orig	542	1
Blackstone Municipal	BKT	NDB OR GPS-A	Amdt 11	661	2.25
Blue Ridge	MTV	RNAV (GPS) RWY 12	Orig	479	1

Airport Name	ID	Approach	Version	HAT or HAA	Visibility (sm or RVR)
Blue Ridge	MTV	RNAV (GPS) RWY 30	Amdt 1	250	1
Blue Ridge	MTV	LOC RWY 30	Orig	415	1
Bridgewater Air Park	VBW	NDB OR GPS-A	Amdt 4B	1135	1.5
Brookneal-Campbell County	0V4	VOR/DME-A	Amdt 1	564	1
Brookneal-Campbell County	0V4	RNAV (GPS) RWY 24	Orig	384	1
Charlottesville-Albemarle	CHO	ILS OR LOC RWY 3	Amdt 13	217	0.5
Charlottesville-Albemarle	CHO	RNAV (GPS) RWY 3	Amdt 1	461	0.5
Charlottesville-Albemarle	CHO	RNAV (GPS) Y RWY 21	Amdt 1	752	1.25
Charlottesville-Albemarle	CHO	RNAV (GPS) Z RWY 21	Orig	250	1
Chase City Municipal	CXE	RNAV (GPS) RWY 18	Orig	597	1
Chase City Municipal	CXE	RNAV (GPS) RWY 36	Orig	537	1
Chesapeake Regional	CPK	ILS RWY 5	Orig	200	0.5
Chesapeake Regional	CPK	RNAV (GPS) RWY 5	Orig	400	1
Chesapeake Regional	CPK	VOR/DME RWY 23	Orig A	460	1
Chesterfield County	FCI	ILS OR LOC RWY 33	Amdt 2	200	0.5
Chesterfield County	FCI	RNAV (GPS) RWY 15	Orig	443	1
Chesterfield County	FCI	RNAV (GPS) RWY 33	Orig	252	0.5
Culpeper Regional	CJR	LOC RWY 4	Orig	384	1
Culpeper Regional	CJR	VOR/DME RNAV OR GPS RWY 22	Amdt 1B	507	1
Culpeper Regional	CJR	VOR OR GPS-A	Amdt 4B	667	1
Culpeper Regional	CJR	NDB OR GPS-B	Orig A	667	1
Culpeper Regional	CJR	NDB RWY 4	Orig	604	1
Danville Regional	DAN	ILS RWY 2	Amdt 3	200	0.5
Danville Regional	DAN	GPS RWY 20	Orig A	432	1
Danville Regional	DAN	VOR RWY 2	Amdt 13	492	0.75
Danville Regional	DAN	VOR RWY 20	Amdt 1	432	1
Dinwiddie County	PTB	RNAV (GPS) RWY 5	Orig	467	1
Dinwiddie County	PTB	RNAV (GPS) RWY 23	Orig	528	1
Dinwiddie County	PTB	LOC RWY 5	Amdt 1A	427	0.75
Dinwiddie County	PTB	VOR RWY 23	Amdt 5	508	1.25
Emporia-Greensville Regional	EMV	RNAV (GPS) RWY 33	Orig A	299	1
Emporia-Greensville Regional	EMV	LOC RWY 33	Orig A	299	1
Falwell	W24	RNAV (GPS) RWY 28	Orig	521	1
Farmville Regional	FVX	GPS RWY 21	Orig	403	1
Farmville Regional	FVX	NDB OR GPS RWY 3	Amdt 5	810	1.25
Franklin Municipal	FKN	RNAV (GPS) RWY 9	Orig	545	1
Franklin Municipal	FKN	RNAV (GPS) RWY 27	Orig	419	0.75
Franklin Municipal	FKN	VOR/DME RWY 27	Amdt 9D	599	0.75
Franklin Municipal	FKN	VOR RWY 9	Amdt 14B	545	1
Front Royal-Warren County	FRR	RNAV (GPS) -A	Orig	1116	1.25
Grundy Municipal	GDY	GPS RWY 22	Orig	416	1
Hampton Roads Executive	PVG	GPS RWY 10	Orig A	380	1
Hampton Roads Executive	PVG	GPS RWY 28	Orig A	800	1.25
Hampton Roads Executive	PVG	NDB OR GPS RWY 2	Amdt 6B	559	1
Hanover County Municipal	OFP	GPS RWY 16	Amdt 1B	475	1
Hanover County Municipal	OFP	LOC RWY 16	Amdt 2A	475	1

Airport Name	ID	Approach	Version	HAT or HAA	Visibility (sm or RVR)
Hanover County Municipal	OFP	VOR RWY 16	Amdt 2	475	1
Hummel Field	W75	GPS RWY 1	Orig A	490	1
Ingalls Field	HSP	ILS RWY 25	Amdt 3	315	1
Ingalls Field	HSP	GPS RWY 7	Orig A	808	1.25
Ingalls Field	HSP	GPS RWY 25	Orig A	668	1
Lawrenceville-Brunswick Municipal	LVL	RNAV (GPS) RWY 18	Orig	511	1
Lawrenceville-Brunswick Municipal	LVL	RNAV (GPS) RWY 36	Orig	433	1
Lee County	0VG	RNAV (GPS) RWY 7	Orig	737	1
Lee County	0VG	RNAV (GPS) RWY 25	Orig	849	1.25
Leesburg Executive	JYO	RNAV (GPS) RWY 17	Amdt 1	258	1
Leesburg Executive	JYO	LOC RWY 17	Amdt 2A	338	1
Leesburg Executive	JYO	VOR OR GPS-A	Amdt 1A	511	1
Lonesome Pine	LNP	RNAV (GPS) RWY 6	Orig	589	1
Lonesome Pine	LNP	RNAV (GPS) RWY 24	Orig	337	1
Lonesome Pine	LNP	GPS RWY 6	Orig	609	1
Lonesome Pine	LNP	LOC/DME RWY 24	Orig A	615	1
Louisa County	LKU	LOC RWY 27	Amdt 1	287	1
Louisa County	LKU	NDB OR GPS RWY 27	Orig-B	687	1
Luray Caverns	W45	GPS RWY 22	Amdt 1	1358	1.5
Luray Caverns	W45	VOR/DME-B	Amdt 2	1417	1.5
Luray Caverns	W45	NDB OR GPS-A	Amdt 5	1417	1.5
Lynchburg Regional	LYH	ILS RWY 4	Amdt 15A	200	2400
Lynchburg Regional	LYH	GPS RWY 22	Orig B	682	1
Lynchburg Regional	LYH	VOR/DME RWY 22	Amdt 8B	802	1.25
Lynchburg Regional	LYH	VOR OR GPS RWY 4	Amdt 11D	482	2400
Manassas Regional	HEF	ILS RWY 16L	Amdt 4B	250	0.75
Manassas Regional	HEF	RNAV (GPS) RWY 16L	Orig A	298	0.5
Manassas Regional	HEF	RNAV (GPS) RWY 16R	Orig	455	1
Manassas Regional	HEF	RNAV (GPS) RWY 34R	Orig	443	1
Marks Municipal	W63	GPS RWY 4	Orig	417	1
Marks Municipal	W63	VOR/DME-A	Orig	619	1
Mecklenburg-Brunswick Regional	AVC	GPS RWY 19	Orig	318	1
Mecklenburg-Brunswick Regional	AVC	LOC RWY 1	Orig	383	1
Middle Peninsula Regional	FYJ	VOR OR GPS-A	Amdt 3	556	1
Mountain Empire	MKJ	RNAV (GPS) RWY 26	Orig	529	1.25
Mountain Empire	MKJ	LOC RWY 26	Amdt 1A	542	1
New Kent County	W96	RNAV (GPS) RWY 10	Orig A	437	1
New Kent County	W96	RNAV (GPS) RWY 28	Orig A	417	1
New River Valley	PSK	ILS RWY 6	Amdt 4	209	1
New River Valley	PSK	RNAV (GPS) RWY 24	Orig	250	1
New River Valley	PSK	VOR/DME OR GPS RWY 6	Amdt 7	515	1
New River Valley	PSK	VOR OR GPS-A	Amdt 8	635	1
Newport News-Williamsburg Int'l	PHF	ILS OR LOC RWY 25	Orig	200	0.75
Newport News-Williamsburg Int'l	PHF	ILS RWY 7	Amdt 31	200	2400
Newport News-Williamsburg Int'l	PHF	RNAV (GPS) RWY 2	Orig	441	1
Newport News-Williamsburg Int'l	PHF	RNAV (GPS) RWY 7	Amdt 1	400	2400

Airport Name	ID	Approach	Version	HAT or HAA	Visibility (sm or RVR)
Newport News-Williamsburg Int'l	PHF	RNAV (GPS) RWY 20	Orig	397	1
Newport News-Williamsburg Int'l	PHF	RNAV (GPS) RWY 25	Amdt 1	379	1
Newport News-Williamsburg Int'l	PHF	NDB RWY 2	Amdt 5	661	1
Newport News-Williamsburg Int'l	PHF	NDB RWY 20	Amdt 4	817	1.25
Norfolk International	ORF	ILS RWY 5	Amdt 24E	200	1800
Norfolk International	ORF	ILS RWY 23	Amdt 6E	295	0.75
Norfolk International	ORF	RNAV (GPS) RWY 5	Orig	614	2400
Norfolk International	ORF	RNAV (GPS) RWY 14	Orig A	395	1
Norfolk International	ORF	RNAV (GPS) RWY 23	Orig B	394	0.75
Norfolk International	ORF	RNAV (GPS) RWY 32	Orig A	395	1
Norfolk International	ORF	VOR/DME RWY 5	Amdt 4C	454	4000
Norfolk International	ORF	VOR/DME RWY 14	Amdt 2D	415	1
Norfolk International	ORF	VOR/DME RWY 32	Amdt 4D	415	1
Norfolk International	ORF	VOR RWY 23	Amdt 8C	394	0.75
Orange County	OMH	GPS RWY 8	Orig A	674	1
Orange County	OMH	VOR/DME OR GPS-A	Amdt 2A	1546	3
Richmond International	RIC	ILS OR LOC RWY 34	Amdt 13B	200	1800
Richmond International	RIC	ILS RWY 2	Amdt 1	250	0.75
Richmond International	RIC	ILS RWY 16	Amdt 8	200	2400
Richmond International	RIC	ILS RWY 34 (CAT II)	Amdt 13B	100	1200
Richmond International	RIC	ILS RWY 34 (CAT III)	Amdt 13B	0	600
Richmond International	RIC	RNAV (GPS) RWY 2	Orig	359	0.75
Richmond International	RIC	RNAV (GPS) RWY 7	Orig	382	1
Richmond International	RIC	RNAV (GPS) RWY 16	Orig	413	2400
Richmond International	RIC	RNAV (GPS) RWY 20	Orig	433	1
Richmond International	RIC	RNAV (GPS) RWY 25	Orig	400	1
Richmond International	RIC	RNAV (GPS) RWY 34	Orig A	339	2400
Richmond International	RIC	VOR RWY 2	Amdt 5C	379	1
Richmond International	RIC	VOR RWY 16	Amdt 27A	473	2400
Richmond International	RIC	VOR RWY 20	Amdt 1A	473	1
Richmond International	RIC	VOR RWY 25	Amdt 16A	440	1
Richmond International	RIC	VOR RWY 34	Amdt 23A	379	2400
Roanoke Regional	ROA	ILS OR LOC RWY 33	Amdt 12	585	1.5
Roanoke Regional	ROA	RNAV (GPS) RWY 6	Orig	604	0.75
Roanoke Regional	ROA	RNAV (GPS) RWY 24	Orig	1410	1.25
Roanoke Regional	ROA	RNAV (GPS) RWY 33	Orig B	420	0.5
Roanoke Regional	ROA	LDA RWY 6	Amdt 9	405	1
Roanoke Regional	ROA	VOR/DME-A	Amdt 5	525	1
Roanoke Regional	ROA	VOR/NDB RWY 33	Orig	541	1.25
Ronald Reagan Washington National	DCA	ILS RWY 1	Amdt 40	200	1800
Ronald Reagan Washington National	DCA	ILS RWY 1 (CAT II)	Amdt 40	150	1600
Ronald Reagan Washington National	DCA	RNAV (GPS) RWY 33	Orig	256	0.75
Ronald Reagan Washington National	DCA	RNAV (RNP) RWY 19	Orig B	462	1.5
Ronald Reagan Washington National	DCA	LDA/DME RWY 19	Amdt 2A	706	6000
Ronald Reagan Washington National	DCA	ROSSLYN LDA RWY 19	Amdt 15	1086	3
Ronald Reagan Washington National	DCA	VOR/DME OR GPS RWY 15	Amdt 1C	904	1.25

Airport Name	ID	Approach	Version	HAT or HAA	Visibility (sm or RVR)
Ronald Reagan Washington National	DCA	VOR/DME OR GPS RWY 19	Amdt 9A	926	6000
Ronald Reagan Washington National	DCA	VOR/DME RNAV OR GPS RWY 4	Amdt 6B	706	1
Ronald Reagan Washington National	DCA	VOR RWY 1	Amdt 12	525	2400
Ronald Reagan Washington National	DCA	VOR RWY 15	Amdt 9C	904	1.25
Shannon	EZF	GPS RWY 24	Orig	495	1
Shannon	EZF	NDB RWY 24	Amdt 2A	1015	1.5
Shenandoah Valley Regional	SHD	ILS RWY 5	Amdt 8A	200	0.5
Shenandoah Valley Regional	SHD	GPS RWY 23	Orig	379	1
Shenandoah Valley Regional	SHD	NDB OR GPS RWY 5	Amdt 9B	517	0.75
Smith Mountain Lake	W91	VOR/DME OR GPS RWY 23	Orig-A	647	1
Stafford Regional	RMN	ILS OR LOC RWY 33	Orig	200	0.75
Stafford Regional	RMN	RNAV (GPS) RWY 33	Amdt 1	254	0.75
Stafford Regional	RMN	VOR RWY 33	Amdt 1	544	0.75
Suffolk Executive	SFQ	RNAV (GPS) RWY 4	Amdt 1	413	1
Suffolk Executive	SFQ	RNAV (GPS) RWY 7	Orig	408	1
Suffolk Executive	SFQ	LOC RWY 4	Amdt 2	373	1
Tangier Island	TGI	VOR/DME OR GPS RWY 2	Orig C	713	1.25
Tappahannock-Essex County*	XSA				
Tazewell County	6V3	RNAV (GPS) RWY 25	Orig	507	1
Twin County	HLX	RNAV (GPS) RWY 1	Orig	447	1
Twin County	HLX	RNAV (GPS) RWY 19	Orig	454	1
Twin County	HLX	NDB-A	Amdt 6	787	1.25
Virginia Highlands	VJI	LOC RWY 24	Amdt 2A	493	1
Virginia Highlands	VJI	VOR/DME OR GPS-B	Amdt 5B	883	1.25
Virginia Tech	BCB	RNAV (GPS) RWY 12	Orig	426	1
Virginia Tech	BCB	LOC/DME RWY 12	Amdt 1	347	1
Virginia Tech	BCB	NDB OR GPS-A	Amdt 3A	948	1.25
Wakefield Municipal	AKQ	RNAV (GPS) RWY 20	Orig	487	1
Wakefield Municipal	AKQ	NDB RWY 20	Amdt 4C	727	1
Warrenton-Fauquier	HWY	RNAV (GPS) RWY 14	Orig	452	1
Warrenton-Fauquier	HWY	VOR RWY 14	Amdt 4	412	1
Washington Dulles Int'l	IAD	ILS OR LOC RWY 1R	Amdt 23	200	1800
Washington Dulles Int'l	IAD	ILS OR LOC RWY 19L	Amdt 13	200	2400
Washington Dulles Int'l	IAD	ILS OR LOC/DME RWY 19R	Amdt 24	200	1800
Washington Dulles Int'l	IAD	CONVERGING ILS RWY 12	Amdt 5	600	1.5
Washington Dulles Int'l	IAD	CONVERGING ILS RWY 19L	Amdt 7	600	1.5
Washington Dulles Int'l	IAD	CONVERGING ILS RWY 19R	Amdt 7	600	1.5
Washington Dulles Int'l	IAD	ILS or LOC/DME RWY 12	Amdt 8	200	1800
Washington Dulles Int'l	IAD	ILS RWY 1L	Orig	200	1800
Washington Dulles Int'l	IAD	ILS RWY 1R (CAT II)	Amdt 23	100	1200
Washington Dulles Int'l	IAD	ILS RWY 19R (CAT II)	Amdt 24	100	1200
Washington Dulles Int'l	IAD	ILS RWY 1R (CAT III)	Amdt 23	0	600
Washington Dulles Int'l	IAD	ILS RWY 19R (CAT III)	Amdt 24	0	600
Washington Dulles Int'l	IAD	RNAV (GPS) RWY 1L	Orig	394	2400
Washington Dulles Int'l	IAD	RNAV (GPS) RWY 1R	Orig	368	2400
Washington Dulles Int'l	IAD	RNAV (GPS) RWY 19L	Orig	458	2400

Airport Name	ID	Approach	Version	HAT or HAA	Visibility (sm or RVR)
Washington Dulles Int'l	IAD	RNAV (GPS) RWY 19R	Amdt 1	408	2400
Washington Dulles Int'l	IAD	RNAV (GPS) Y RWY 12	Orig	370	2400
Washington Dulles Int'l	IAD	RNAV (GPS) Z RWY 12	Orig	370	4000
Washington Dulles Int'l	IAD	VOR/DME OR TACAN RWY 12	Amdt 8B	390	2400
William M. Tuck	W78	GPS RWY 1	Orig A	530	1
William M. Tuck	W78	VOR OR GPS-A	Amdt 7A	540	1
Williamsburg-Jamestown	JGG	VOR OR GPS-B	Amdt 2	631	1
Winchester Regional	OKV	ILS RWY 32	Amdt 1	259	0.5
Winchester Regional	OKV	GPS RWY 14	Orig	713	1
Winchester Regional	OKV	VOR/DME OR GPS-A	Amdt 4A	533	1

source: FAA: July 5, 2007 instrument approach procedures

** The former Tappahannock Municipal Airport (W79) did not have any instrument approach procedures and closed shortly after the Study date. However, for purposes of providing the Virginia Department of Aviation with more complete information, the Study Team included the new Tappahannock-Essex County Airport (XSA) into Chapter 6, Recommendations for Individual Airport Improvements.*

COMMONWEALTH'S ACCESSIBILITY – BY APPROACH TYPE

As previously discussed, there are three major categories of instrument approach procedures: precision approaches, approaches with vertical guidance, and nonprecision approaches. Precision approaches offer the best guidance, followed by approaches with vertical guidance and then nonprecision approaches. The following table and figures show which type of procedures are available at the Commonwealth's airports.

Table 3-2 – Instrument Approach Types

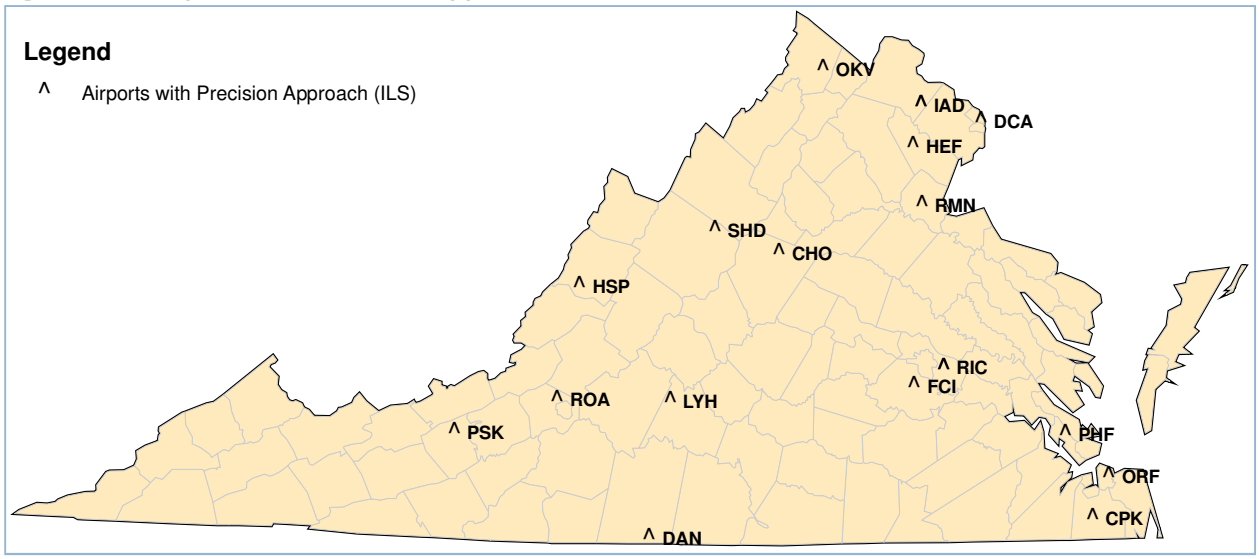
Airport Name	Identifier	Precision Approach (PA)	Approach with Vertical Guidance (APV)		Nonprecision Approach (NPA)
			LPV	VNAV	
Accomack County	MFV				✓
Blackstone Municipal	BKT				✓
Blue Ridge	MTV		✓		✓
Bridgewater Air Park	VBW				✓
Brookneal-Campbell County	0V4				✓
Charlottesville-Albemarle	CHO	✓	✓	✓	✓
Chase City Municipal	CXE				✓
Chesapeake Regional	CPK	✓			✓
Chesterfield County	FCI	✓	✓	✓	✓
Crewe Municipal*	W81				
Culpeper Regional	CJR				✓
Danville Regional	DAN	✓			✓
Dinwiddie County	PTB				✓
Emporia-Greensville Regional	EMV				✓
Falwell	W24				✓

Airport Name	Identifier	Precision Approach (PA)	Approach with Vertical Guidance (APV)		Nonprecision Approach (NPA)
			LPV	VNAV	
Farmville Regional	FVX				✓
Franklin Municipal	FKN				✓
Front Royal-Warren County	FRR				✓
Gordonsville Municipal*	GVE				
Grundy Municipal	GDY				✓
Hampton Roads Executive	PVG				✓
Hanover County Municipal	OFP				✓
Hummel Field	W75				✓
Ingalls Field	HSP	✓			✓
Lake Anna*	7W4				
Lawrenceville-Brunswick	LVL				✓
Lee County	0VG				✓
Leesburg Executive	JYO		✓	✓	✓
Lonesome Pine	LNP		✓	✓	✓
Louisa County	LKU				✓
Lunenburg County*	W31				
Luray Caverns	W45				✓
Lynchburg Regional	LYH	✓			✓
Manassas Regional	HEF	✓	✓	✓	✓
Marks Municipal	W63				✓
Mecklenburg-Brunswick Regional	AVC				✓
Middle Peninsula Regional	FYJ				✓
Mountain Empire	MKJ		✓		✓
New Kent County	W96				✓
New London*	W90				
New Market*	8W2				
New River Valley	PSK	✓	✓	✓	✓
Newport News-Williamsburg Int'l	PHF	✓	✓	✓	✓
Norfolk International	ORF	✓			✓
Orange County	OMH				✓
Richmond International	RIC	✓		✓	✓
Roanoke Regional	ROA	✓			✓
Ronald Reagan Washington National	DCA	✓	✓	✓	✓
Shannon	EZF				✓
Shenandoah Valley Regional	SHD	✓			✓
Smith Mountain Lake	W91				✓
Stafford Regional	RMN	✓	✓	✓	✓
Suffolk Executive	SFQ				✓
Tangier Island	TGI				✓
Tappahannock-Essex County**	XSA				✓
Tazewell County	6V3				✓
Twin County	HLX				✓
Virginia Highlands	VJI				✓
Virginia Tech	BCB		✓	✓	✓

Airport Name	Identifier	Precision Approach (PA)	Approach with Vertical Guidance (APV)		Nonprecision Approach (NPA)
			LPV	VNAV	
Wakefield Municipal	AKQ				✓
Warrenton-Fauquier	HWY				✓
Washington Dulles International	IAD	✓		✓	✓
Waynesboro*	W13				
William M. Tuck	W78				✓
Williamsburg-Jamestown	JGG				✓
Winchester Regional	OKV	✓			✓

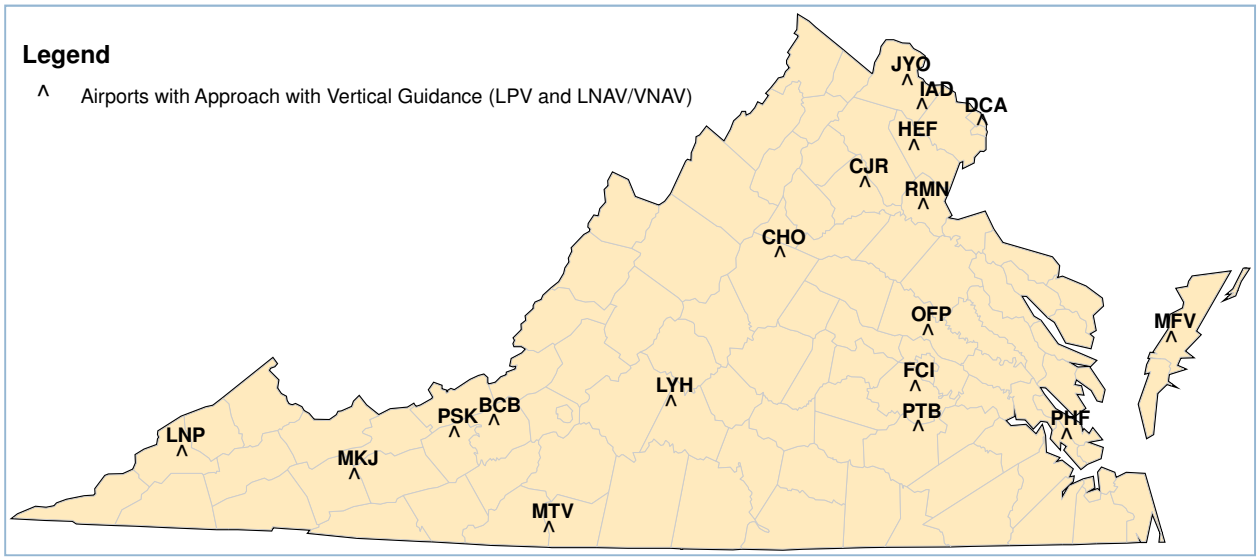
source: summary prepared by Consultant using July 5, 2007 FAA data
** Airport does not have instrument approach procedures (seven local service facilities)*
*** New Airport (XSA). Original Tappahannock Municipal Airport (W79) closed shortly after Study date.*

Figure 3-1 – Airports with Precision Approaches



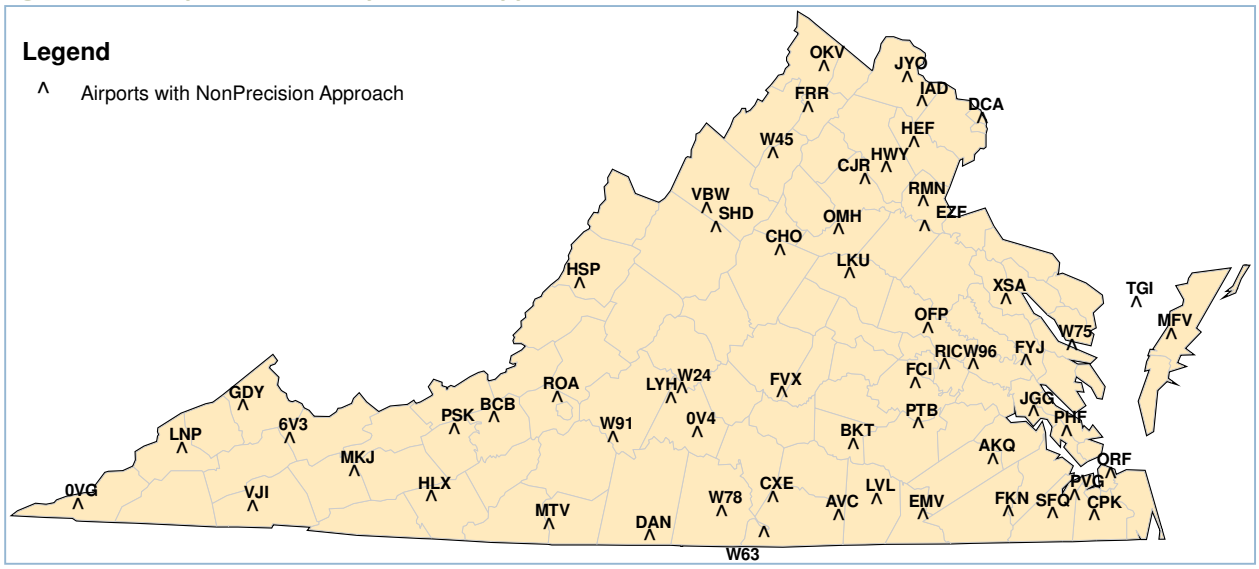
source: Figure developed by consultant for Study using FAA July 5, 2007 instrument approach procedures

Figure 3-2 – Airports with Vertical Guidance Approaches



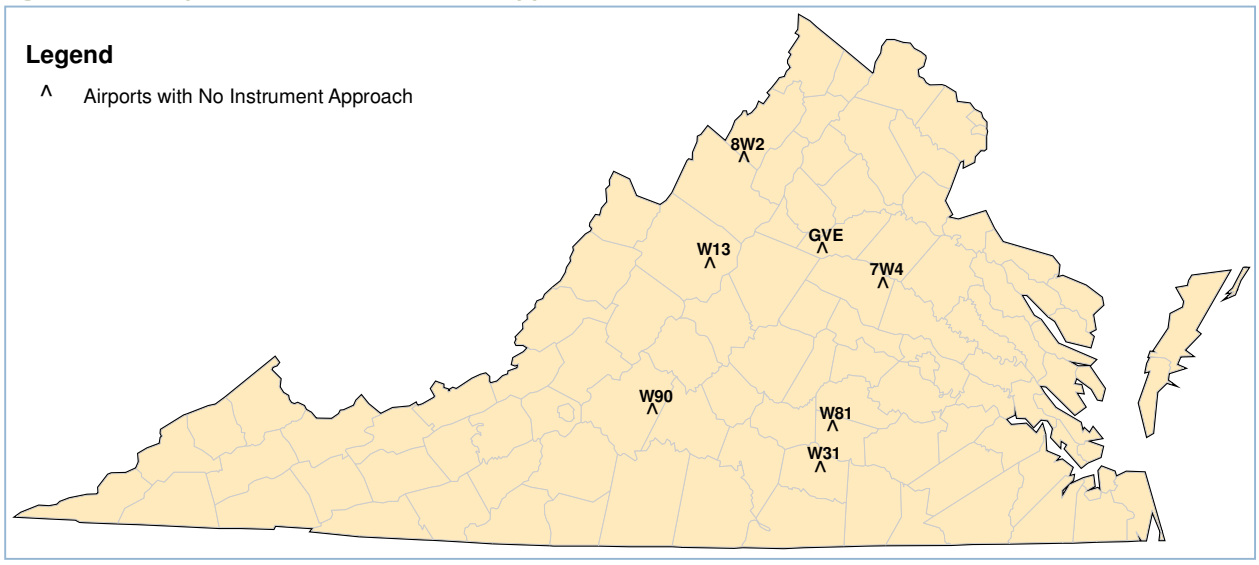
source: Figure developed by consultant for Study using FAA July 5, 2007 instrument approach procedures

Figure 3-3 – Airports with Nonprecision Approaches



source: Figure developed by consultant for Study using FAA July 5, 2007 instrument approach procedures

Figure 3-4 – Airports with No Instrument Approaches



source: Figure developed by consultant for Study using FAA July 5, 2007 instrument approach procedures

LANDING CEILING

The following table lists the procedure with the lowest landing ceiling at each airport. If an airport has multiple procedures with the same published ceiling, the procedure listed first in book of charts been included in the table. This is typically the preferred procedure. Minima shown are for Category B aircraft.

Table 3-3 – Procedures with Lowest Landing Ceiling (HAT or HAA)

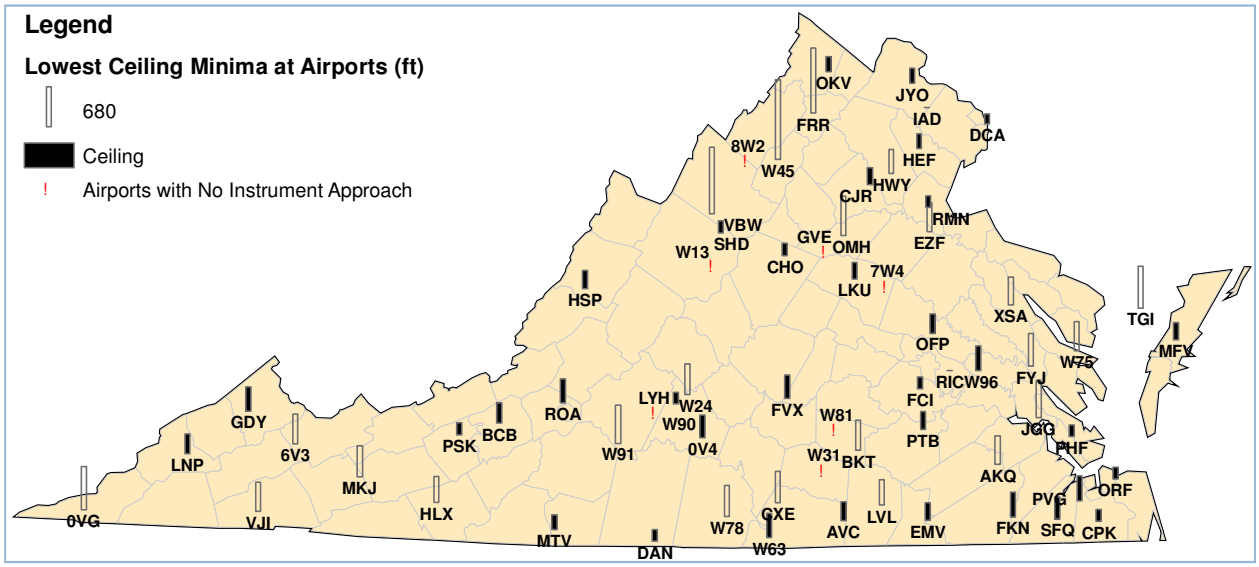
Airport Name	Identifier	Procedure	HAT or HAA	Visibility (sm or RVR)
Accomack County	MFV	RNAV (GPS) RWY 3	299	1
Blackstone Municipal	BKT	RNAV (GPS) RWY 4	511	1
Blue Ridge	MTV	RNAV (GPS) RWY 30 - LPV	250	1
Bridgewater Air Park	VBW	NDB OR GPS-A	1135	1.5
Brookneal-Campbell County	0V4	RNAV (GPS) RWY 24	384	1
Charlottesville-Albemarle	CHO	ILS RWY 3	217	0.5
Chase City Municipal	CXE	RNAV (GPS) RWY 36	537	1
Chesapeake Regional	CPK	ILS RWY 5	200	0.5
Chesterfield County	FCI	ILS OR LOC RWY 33	200	0.5
Crewe Municipal	W81	--	--	--
Culpeper Regional	CJR	RNAV (GPS) RWY 4	294	1
Danville Regional	DAN	ILS RWY 2	200	0.5
Dinwiddie County	PTB	RNAV (GPS) RWY 23	308	1
Emporia-Greensville Regional	EMV	LOC RWY 33	299	1
Falwell	W24	RNAV (GPS) RWY 28	521	1
Farmville Regional	FVX	GPS RWY 21	403	1
Franklin Municipal	FKN	RNAV (GPS) RWY 27	419	0.75
Front Royal-Warren County	FRR	RNAV (GPS) – A	1116	1.5
Gordonsville Municipal	GVE	--	--	--
Grundy Municipal	GDY	GPS RWY 22	416	1
Hampton Roads Executive	PVG	RNAV (GPS) RWY 10	420	1
Hanover County Municipal	OFP	RNAV (GPS) RWY 16	328	1.25
Hummel Field	W75	GPS RWY 1	490	1
Ingalls Field	HSP	ILS RWY 25	315	1
Lake Anna	7W4	--	--	--
Lawrenceville-Brunswick	LVL	RNAV (GPS) RWY 36	433	1
Lee County	0VG	RNAV (GPS) RWY 7	737	1
Leesburg Executive	JYO	RNAV (GPS) RWY 17	258	1
Lonesome Pine	LNP	RNAV (GPS) RWY 24	337	1.25
Louisa County	LKU	LOC RWY 27	287	1
Lunenburg County	W31	--	--	--
Luray Caverns	W45	GPS RWY 22	1358	1.5

Airport Name	Identifier	Procedure	HAT or HAA	Visibility (sm or RVR)
Lynchburg Regional	LYH	ILS RWY 4	200	2400
Manassas Regional	HEF	ILS RWY 16L	250	0.75
Marks Municipal	W63	GPS RWY 4	417	1
Mecklenburg-Brunswick Regional	AVC	GPS RWY 19	318	1
Middle Peninsula Regional	FYJ	VOR OR GPS-A	556	1
Mountain Empire	MKJ	RNAV (GPS) RWY 26	529	2
New Kent County	W96	RNAV (GPS) RWY 28	417	1
New London	W90	--	--	--
New Market	8W2	--	--	--
New River Valley	PSK	ILS RWY 6	209	1
Newport News-Williamsburg Int'l	PHF	ILS RWY 7	200	2400
Norfolk International	ORF	ILS RWY 5	200	1800
Orange County	OMH	GPS RWY 8	674	1
Richmond International	RIC	ILS RWY 34 (CAT III)	0	0
Roanoke Regional	ROA	LDA RWY 6	405	1
Ronald Reagan Washington National	DCA	ILS RWY 1 (CAT II)	165	1600
Shannon	EZF	GPS RWY 24	495	1
Shenandoah Valley Regional	SHD	ILS RWY 5	200	0.5
Smith Mountain Lake	W91	VOR/DME OR GPS RWY 24	647	1
Stafford Regional	RMN	ILS RWY 33	200	0.75
Suffolk Executive	SFQ	LOC RWY 4	373	1
Tangier Island	TGI	VOR/DME OR GPS RWY 2	713	1.25
Tappahannock-Essex County	XSA	RNAV (GPS) RWY 28	470	1
Tazewell County	6V3	RNAV (GPS) RWY 25	507	1
Twin County	HLX	RNAV (GPS) RWY 1	447	1
Virginia Highlands	VJI	LOC RWY 24	493	1
Virginia Tech	BCB	LOC/DME RWY 12	347	1
Wakefield Municipal	AKQ	RNAV (GPS) RWY 20	487	1
Warrenton-Fauquier	HWY	RNAV (GPS) RWY 20	412	1
Washington Dulles International	IAD	ILS RWY 1R (CAT III)	0	0
Waynesboro	W13	---	--	--
William M. Tuck	W78	GPS RWY 1	530	1
Williamsburg-Jamestown	JGG	VOR OR GPS-B	631	1
Winchester Regional	OKV	ILS RWY 32	259	0.5

source: Summary table developed by consultant for Study using FAA July 5, 2007 instrument approach procedures

The following figure graphically depicts the lowest landing ceiling at each of the Commonwealth's airports.

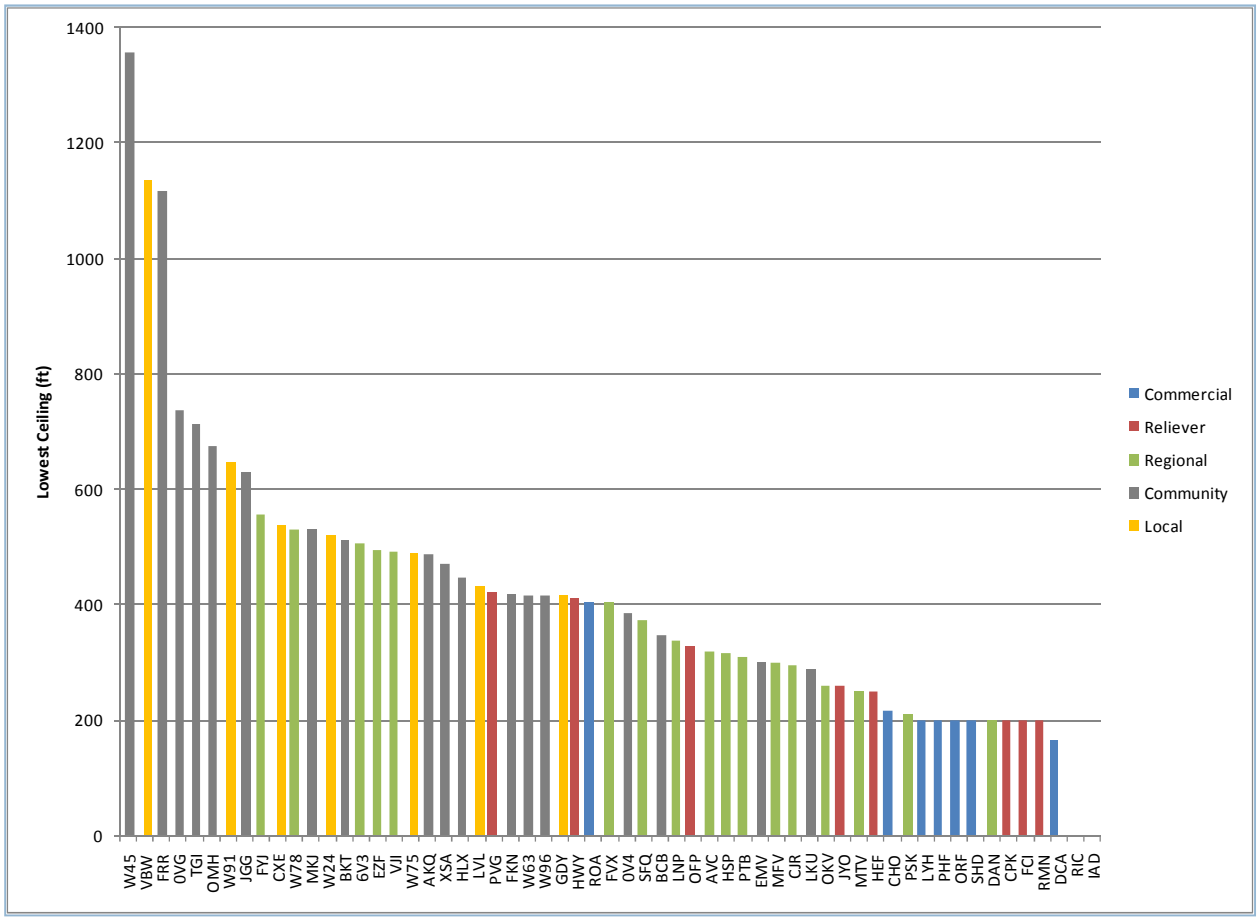
Figure 3-5 - Figure of Lowest Landing Ceilings



source: Figure developed by consultant for Study using FAA July 5, 2007 instrument approach procedures

The following chart graphically depicts the lowest landing ceiling at each of the Commonwealth's airports, sorted by ceiling.

Figure 3-6 – Chart of Lowest Landing Ceilings



source: Figure developed by consultant for Study using FAA July 5, 2007 instrument approach procedures

VISIBILITY CEILING

The following table lists the procedure with the lowest landing visibility at each airport. If an airport has multiple procedures with the same published visibility, the procedure listed first in the book of charts has been included in the table. This is typically the preferred procedure. Minima shown are for Category B aircraft.

Table 3-4 – Lowest Landing Visibilities

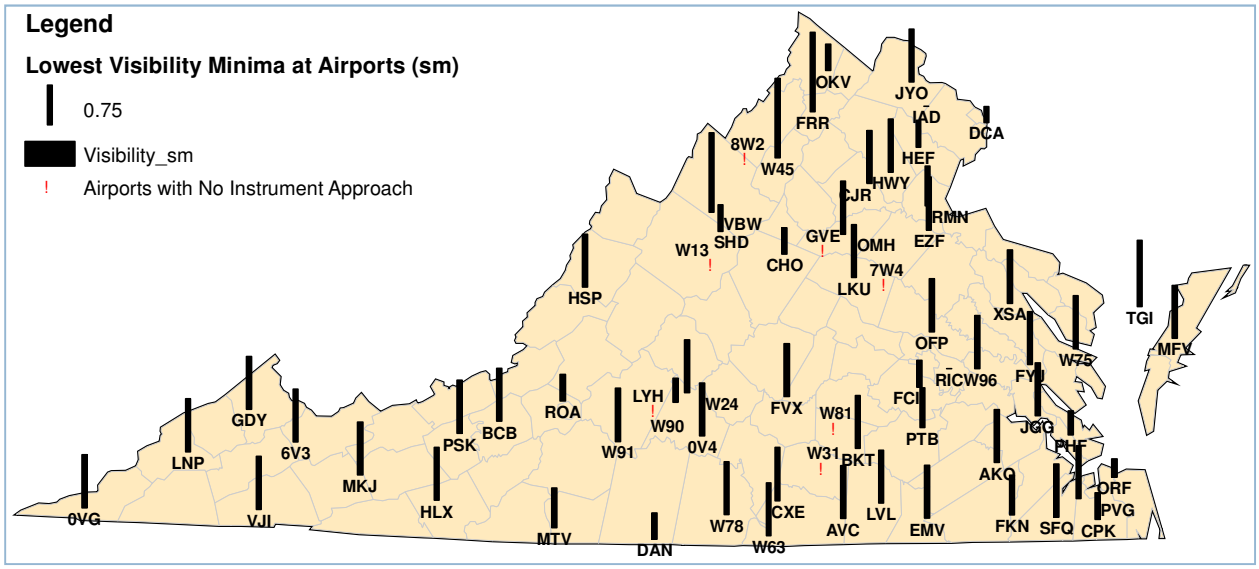
Airport Name	Identifier	Procedure	HAT or HAA	Visibility (sm or RVR)
Accomack County	MFV	RNAV (GPS) RWY 3	299	1
Blackstone Municipal	BKT	RNAV (GPS) RWY 4	511	1
Blue Ridge	MTV	RNAV (GPS) RWY 30 - LNAV	695	0.75
Bridgewater Air Park	VBW	NDB OR GPS-A	1135	1.5
Brookneal-Campbell County	0V4	RNAV (GPS) RWY 24	384	1
Charlottesville-Albemarle	CHO	ILS RWY 3	217	0.5
Chase City Municipal	CXE	RNAV (GPS) RWY 36	537	1
Chesapeake Regional	CPK	ILS RWY 5	200	0.5
Chesterfield County	FCI	ILS OR LOC RWY 33	200	0.5
Crewe Municipal	W81	--	--	--
Culpeper Regional	CJR	RNAV (GPS) RWY 4	294	1
Danville Regional	DAN	ILS RWY 2	200	0.5
Dinwiddie County	PTB	RNAV (GPS) RWY 5	407	0.75
Emporia-Greensville Regional	EMV	LOC RWY 33	299	1
Falwell	W24	RNAV (GPS) RWY 28	521	1
Farmville Regional	FVX	GPS RWY 21	403	1
Franklin Municipal	FKN	RNAV (GPS) RWY 27	419	0.75
Front Royal-Warren County	FRR	RNAV (GPS) – A	1116	1.5
Gordonsville Municipal	GVE	--	--	--
Grundy Municipal	GDY	GPS RWY 22	416	1
Hampton Roads Executive	PVG	RNAV (GPS) RWY 10	420	1
Hanover County Municipal	OFP	LOC RWY 16	353	1
Hummel Field	W75	GPS RWY 1	490	1
Ingalls Field	HSP	ILS RWY 25	315	1
Lake Anna	7W4	--	--	--
Lawrenceville-Brunswick	LVL	RNAV (GPS) RWY 36	433	1
Lee County	0VG	RNAV (GPS) RWY 7	737	1
Leesburg Executive	JYO	RNAV (GPS) RWY 17	258	1
Lonesome Pine	LNP	RNAV (GPS) RWY 6	589	1
Louisa County	LKU	LOC RWY 27	287	1
Lunenburg County	W31	--	--	--
Luray Caverns	W45	GPS RWY 22	1358	1.5
Lynchburg Regional	LYH	ILS RWY 4	200	2400
Manassas Regional	HEF	RNAV (GPS) RWY 16L	298	0.5
Marks Municipal	W63	GPS RWY 4	417	1
Mecklenburg-Brunswick Regional	AVC	GPS RWY 19	318	1
Middle Peninsula Regional	FYJ	VOR OR GPS-A	556	1
Mountain Empire	MKJ	LOC RWY 26	542	1

Airport Name	Identifier	Procedure	HAT or HAA	Visibility (sm or RVR)
New Kent County	W96	RNAV (GPS) RWY 28	417	1
New London	W90	--	--	--
New Market	8W2	--	--	--
New River Valley	PSK	ILS RWY 6	209	1
Newport News-Williamsburg Int'l	PHF	ILS RWY 7	200	2400
Norfolk International	ORF	ILS RWY 5	200	1800
Orange County	OMH	GPS RWY 8	674	1
Richmond International	RIC	ILS RWY 34 (CAT III)	0	0
Roanoke Regional	ROA	LDA RWY 6	405	1
Ronald Reagan Washington National	DCA	ILS RWY 1 (CAT II)	165	1600
Shannon	EZF	GPS RWY 24	495	1
Shenandoah Valley Regional	SHD	ILS RWY 5	200	0.5
Smith Mountain Lake	W91	VOR/DME OR GPS RWY 24	647	1
Stafford Regional	RMN	ILS RWY 33	200	0.75
Suffolk Executive	SFQ	LOC RWY 4	373	1
Tangier Island	TGI	VOR/DME OR GPS RWY 2	713	1.25
Tappahannock-Essex County	XSA	RNAV (GPS) RWY 28	470	1
Tazewell County	6V3	RNAV (GPS) RWY 25	507	1
Twin County	HLX	RNAV (GPS) RWY 1	447	1
Virginia Highlands	VJI	LOC RWY 24	493	1
Virginia Tech	BCB	LOC/DME RWY 12	347	1
Wakefield Municipal	AKQ	RNAV (GPS) RWY 20	487	1
Warrenton-Fauquier	HWY	RNAV (GPS) RWY 20	412	1
Washington Dulles International	IAD	ILS RWY 1R (CAT III)	0	0
Waynesboro	W13	---	--	--
William M. Tuck	W78	GPS RWY 1	530	1
Williamsburg-Jamestown	JGG	VOR OR GPS-B	631	1
Winchester Regional	OKV	ILS RWY 32	259	0.5

source: Summary table developed by consultant for Study using FAA July 5, 2007 instrument approach procedures

The following figure graphically depicts the lowest landing visibility at each of the Commonwealth's airports.

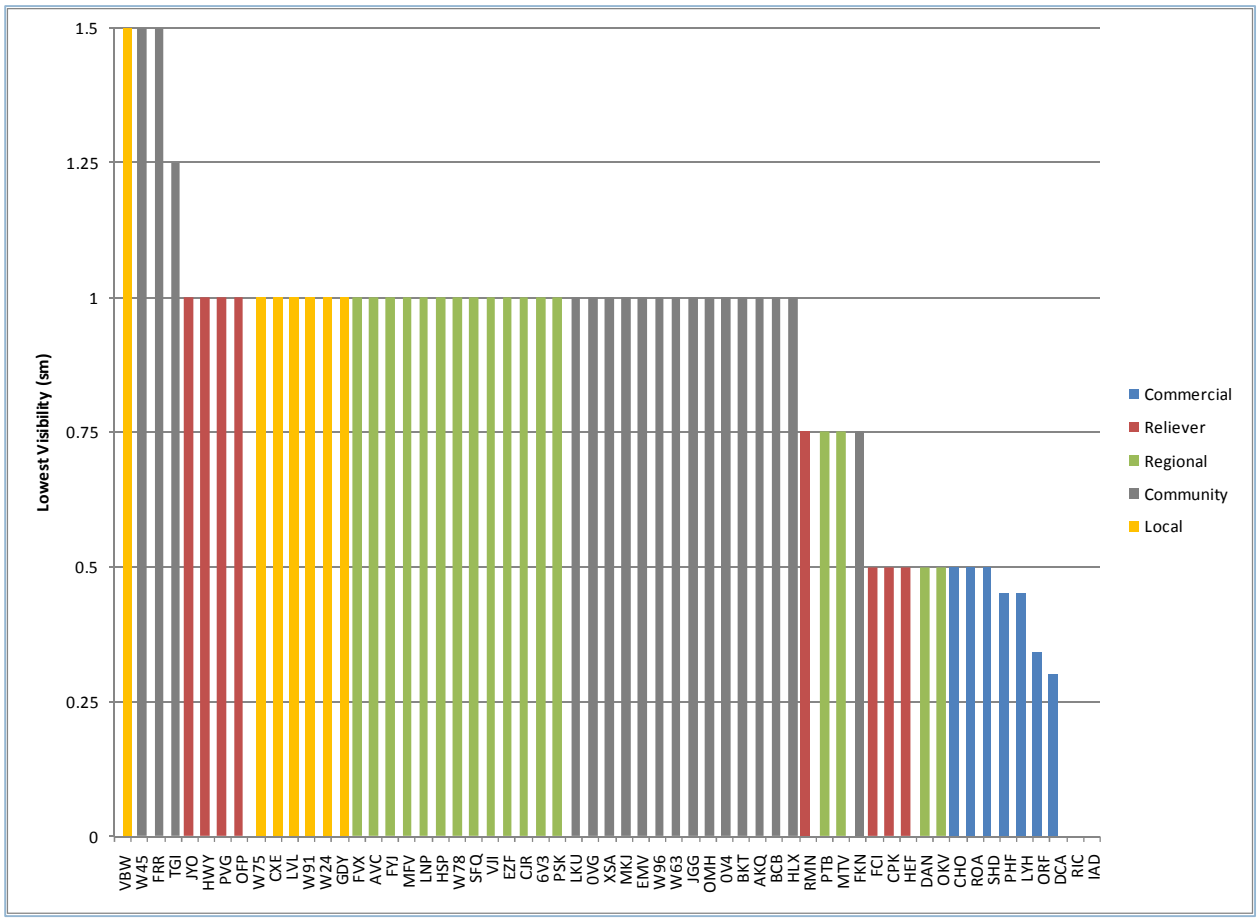
Figure 3-7 – Figure of Lowest Landing Visibilities



source: Figure developed by consultant for Study using FAA July 5, 2007 instrument approach procedures

The following chart graphically depicts the lowest landing ceiling at each of the Commonwealth's airports, sorted by ceiling.

Figure 3-8 – Chart of Lowest Landing Visibilities



source: Figure developed by consultant for Study using FAA July 5, 2007 instrument approach procedures

CHAPTER 4 - EQUIPMENT INVENTORY

As outlined in the previous chapter, a NAVAID is any visual or electronic device on-airport or on the surface which provides point-to-point guidance information or position data to aircraft in flight. Traditional NAVAIDs include NDBs, VORs and VORTACs, Localizers and Glide Slopes. A variety of these systems exist in the Commonwealth – owned and operated by both the Virginia Department of Aviation (DOAV) as well as by the Federal Aviation Administration (FAA).

A comprehensive inventory effort was conducted as part of this Study and items of broad-based interest are summarized here in this chapter. Additionally, more inventory information is included in Appendix C and a companion geographic information system (GIS) was provided to the DOAV as part of this Study.

NDB SYSTEMS

There is currently a robust system of public-use, non-directional beacons located within the Commonwealth. It should be noted that several NDB facilities within the Commonwealth have been decommissioned in recent months. The table below lists each public-use facility, including identifier, location and ownership.

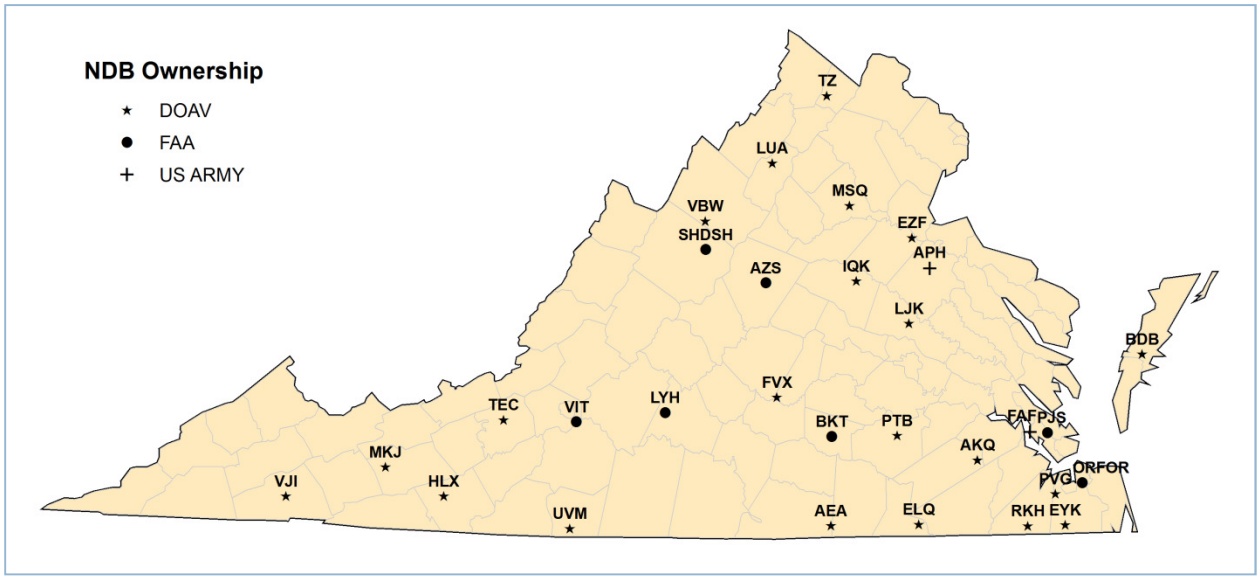
Table 4-1 – Non-Directional Beacons

System Type	Identifier	Name	Location	Ownership
NDB/M	APH	A.P. Hill	Fort A.P. Hill	US Army
NDB/M	BDB	Accomack	Melfa	DOAV
NDB/M*	LJK	Ashey	Ashland	DOAV
NDB/M	AZS	Azalea Park	Charlottesville	FAA
NDB/M	UVM	Bales	Martinsville	DOAV
NDB/M	BKT	Blackstone	Blackstone	FAA
NDB/M	LYH	Bojar	Lynchburg	FAA
NDB/M	VBW	Bridgewater	Bridgewater	DOAV
NDB/M	LUA	Caverns	Luray	DOAV
NDB/M*	EYK	Chesi	Chesapeake	DOAV
NDB/M*	TZ	Cogan	Winchester	DOAV
NDB/M	ELQ	Emporia	Emporia	DOAV
NDB/M	FVX	Farmville	Farmville	DOAV
NDB/M	FAF	Felker	Fort Eustis	US Army
NDB/M	PJS	Henry	Newport News	FAA
NDB/M	HLX	Hillsville	Galax / Hillsville	DOAV
NDB/C	ORFOR	Ingle	Norfolk	FAA
NDB/M	AEA	Jones	South Hill	DOAV
NDB/M*	IQK	Louisa	Louisa	DOAV
NDB/M	MSQ	Nailr	Culpeper	DOAV
NDB/M	PTB	Petersburg	Petersburg	DOAV
NDB/M	PVG	Portsmouth	Norfolk	DOAV

System Type	Identifier	Name	Location	Ownership
NDB/M	EZF	Shannon	Fredericksburg	DOAV
NDB/C	SHDSH	Staut	Staunt./Waynes./Harr.	FAA
NDB/M	MKJ	Suzze	Marion / Wytheville	DOAV
NDB/M	TEC	Tech	Blacksburg	DOAV
NDB/M	VIT	Vinton	Roanoke	FAA
NDB/M	AKQ	Wakefield	Wakefield	DOAV
NDB/M	RKH	Waley	Suffolk	DOAV
NDB/M	VJI	Whine	Abingdon	DOAV

source: Table developed by consultant for Study using FAA AVN datasheet system (effective July 5, 2007)
**decommissioned during duration of the Study*

Figure 4-1 – NDB Systems



source: Figure developed by consultant for Study using FAA AVN datasheet system (effective July 5, 2007)

VOR/VORTAC SYSTEMS

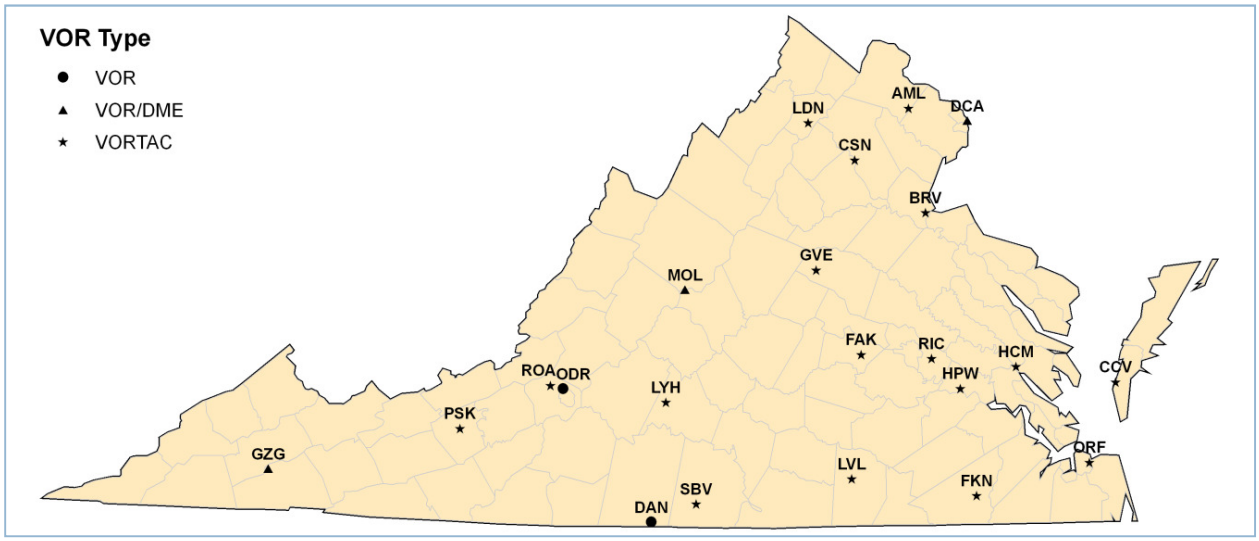
Currently, there are two VORs, two VORs with DME (VOR/DME) and 17 VORTACs located within the geographic boundaries of Virginia. Table 4-2 lists each facility, including identifier, location and ownership.

Table 4-2 – VOR/VORTAC Systems

System Type	Identifier	Name	Location	Ownership
VORTAC	AML	Armel	Herndon	FAA
VORTAC	BRV	Brooke	Brooke	FAA
VORTAC	CCV	Cape Charles	Cape Charles	FAA
VORTAC	CSN	Casanova	Casanova	FAA
VOR	DAN	Danville	Danville	FAA
VORTAC	FAK	Flat Rock	Flat Rock	FAA
VORTAC	FKN	Franklin	Franklin	FAA
VOR/DME	GZG	Glade Spring	Blackford	FAA
VORTAC	GVE	Gordonsville	Gordonsville	FAA
VORTAC	HCM	Harcum	Harcum	FAA
VORTAC	HPW	Hopewell	Hopewell	FAA
VORTAC	LVL	Lawrenceville	Lawrenceville	FAA
VORTAC	LDN	Linden	Linden	FAA
VORTAC	LYH	Lynchburg	Lynchburg	FAA
VOR/DME	MOL	Montebello	Montebello	FAA
VORTAC	ORF	Norfolk	Norfolk	FAA
VORTAC	PSK	Pulaski	Dublin	FAA
VORTAC	RIC	Richmond	Richmond	FAA
VORTAC	ROA	Roanoke	Roanoke	FAA
VORTAC	SBV	South Boston	South Boston	FAA
VOR/DME	DCA	Washington	Washington	FAA
VOR	ODR	Woodrum	Roanoke	FAA

source: Table developed by consultant for Study using FAA AVN datasheet system (effective July 5, 2007)

Figure 4-2 – VOR/VORTAC Systems



source: Figure developed by consultant for Study using FAA AVN datasheet system (effective July 5, 2007)

Many of the VOR systems in the Commonwealth are plagued with published restrictions which result in unusable radials and altitudes. A summary is presented below:

Table 4-3 – VOR/VORTAC Restrictions

VOR/VORTAC	RESTRICTIONS	
Armel (AML)	VOR portion unusable	320-355 beyond 15 nm below 4000 ft
	TACAN azimuth & DME unusable	beyond 35 nm below 2500 ft
	VOR portion unusable	210-250 all dstcs & alts
Brooke (BRV)	TACAN azimuth & DME unusable	beyond 35 nm below 3500 ft
	VOR portion unusable	077-083 all dstcs & alts;
		084 beyond 16 nm;
		084 below 9000 ft;
		085-089 beyond 16 nm;
		090-140 beyond 10 nm below 3000 ft;
		341-006 beyond 10 nm below 5500 ft;
		341-006 beyond 30 nm below 8500 ft;
		341-006 beyond 36 nm all alts;
		341-006 all dstcs below 2500 ft
	VORTAC unusable	141-308 beyond 10 nm below 3000 ft;
		141-308 beyond 24 nm below 6000 ft
CapeCharles (CCV)	TACAN azimuth unusable	
	VOR portion unusable	137-322 beyond 17 nm below 2000 ft;
		137-322 beyond 22 nm below 3000 ft
Casanova (CSN)	VORTAC unusable	310-350 beyond 10 nm below 11000 ft
Flat Rock (FAK)	VOR portion unusable	067-230 all dstcs & alts
	TACAN 338 deg radial unusable	
Franklin (FKN)	VOR portion unusable	090-119 beyond 18 nm below 2000 ft
	TACAN azimuth & DME unusable	090-139 all alts all dstcs
	VOR unusable	119-128 beyond 10 nm
	VOR unusable	129-134 beyond 33 nm
	VOR unusable	135-148 all alts all dstcs
Glade Spring (GZG)	VOR portion unusable	351-004 beyond 15 nm below 8000 ft
Gordonsville (GVE)	TACAN unusable	250-260 beyond 25 nm below 7000 ft
Harcum (HCM)	VOR portion unusable	056-095 below 2000 ft;
		275-300 below 2000 ft
Linden (LDN)	DME portion unusable	115-150 beyond 20 nm below 3500 ft;
		150-155 beyond 20 nm below 4000 ft;
		155-175 beyond 20 nm below 4500 ft;
		175-200 beyond 20 nm below 5000 ft;
		200-225 beyond 20 nm below 5500 ft
	TACAN azimuth unusable	115-225 beyond 20 nm
Lawrenceville (LVL)	VOR portion unusable	r-090 beyond 20 nm all alts;
		r-090 all dstcs below 7000 ft;
		091-105 all dstcs & alts;
		r-106 beyond 27 nm all alts;
		r-106 all dstcs below 7500 ft;

VOR/VORTAC	RESTRICTIONS	
		107-170 all dstcs & alts;
		171-180 all dstcs below 6000 ft;
		201-325 beyond 17 nm below 9000 ft;
		326-089 all dstcs & alts
Lynchburg (LYH)	VOR unusable	236-241 within 20 nm below 8000 ft
	VOR unusable	253-257 within 20 nm below 8000 ft
Motebello (MOL)	DME antenna offset 200 ft ne at lat 37-54-02.71n long 079-06-21.89w	
	DME portion unusable	061-088 beyond 35 nm below 6000 ft;
		114-120 beyond 28 nm below 6500 ft;
		154-220 beyond 28 nm below 8000 ft;
		330-335 beyond 30 nm below 6000 ft;
		335-001 beyond 30 nm below 7000 ft
	VOR portion unusable	205-220 beyond 10 nm below 6000 ft
Norfolk (ORF)	VORTAC unusable	beyond 30 nm below 2500 ft
Pulaski (PSK)	TACAN azimuth unusable	052-100 all dstcs all alts;
		234-283 all dstcs all alts;
	TACAN azimuth & DME unusable	034-038 beyond 25 nm all alts;
		135-175 beyond 25 nm below 10000 ft;
		200-225 beyond 10 nm all alts;
		284-286 beyond 10 nm below 10000 ft;
		287-316 beyond 25 nm below 10000 ft;
		315-335 beyond10 nm below 10000 ft;
		334-039 beyond 25 nm below 10000 ft
	DME unusable	250-350 beyond 25 nm below 10000 ft
Richmond (RIC)	TACAN azimuth unusable	060-075 beyond 10 nm below 1700 ft
Roanoke (ROA)	DME and TACAN azimuth unusable	270-005 beyond 20 nm below 6000 ft
Washington (DCA)	VOR unusable	026-070 beyond 20 nm below 5000 ft
		071-075 beyond 20 nm below 5500 ft
		076-105 beyond 20 nm below 5000 ft
		090-165 beyond 30 nm below 3000 ft
		106-111 beyond 10 nm below 2500 ft
		106-125 beyond 20 nm below 8000 ft
		126-145 beyond 20 nm below 5500 ft
		146-155 beyond 20 nm below 6000 ft
		156-170 beyond 20 nm below 5500 ft
		171-177 beyond 20 nm below 5000 ft
		178-260 beyond 20 nm below 4500 ft
		250-270 beyond 20 nm below 2500 ft
		261-275 beyond 20 nm below 6000 ft
		276-283 beyond 20 nm below 7000 ft
		284-300 beyond 20 nm below 6000 ft
		301-025 beyond 20 nm below 4500 ft
	DME portion unusable	340-040 beyond 30 nm below 2500 ft
Woodrum (ODR)	VOR unusable	035-050 beyond 20 nm below 7000 ft;
		035-110 beyond 15 nm below 6500 ft;
		290-360 beyond 15 nm all alts

source: Table developed by consultant for Study using FAA Airport/Facility Directory (effective July 5, 2007)

LOCALIZER AND GLIDE SLOPE SYSTEMS

As detailed in the previous chapter, there are numerous ILS and LOC approaches to public-use airports within the Commonwealth. The equipment for these approaches is detailed in the following table.

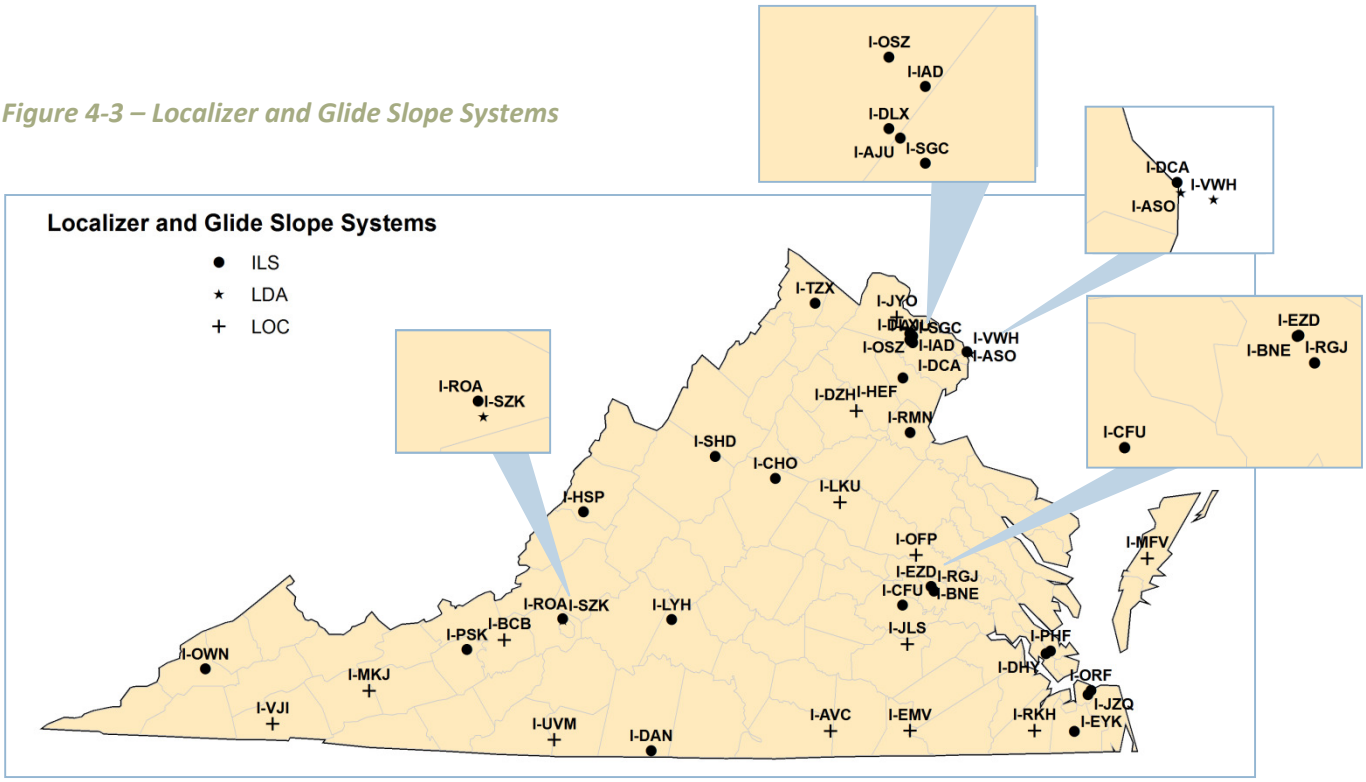
Table 4-4 – Localizer and Glide Slope Systems

System Type	Identifier	Airport Name	Approach End	Ownership
ILS	I-CHO	Charlottesville-Albemarle	Runway 3	FAA
ILS	I-DAN	Danville Regional	Runway 2	FAA
ILS	I-HSP	Ingalls Field	Runway 25	FAA
ILS	I-LYH	Lynchburg Regional	Runway 4	FAA
ILS	I-HEF	Manassas Regional	Runway 16L	FAA
ILS	I-PSK	New River Valley	Runway 6	FAA
ILS	I-EZD	Richmond International	Runway 2	FAA
ILS	I-RGJ	Richmond International	Runway 16	FAA
ILS	I-BNE	Richmond International	Runway 34	FAA
ILS	I-ROA	Roanoke Regional	Runway 33	FAA
ILS	I-SHD	Shenandoah Valley Regional	Runway 5	FAA
ILS	I-AJU	Washington-Dulles	Runway 12	FAA
ILS	I-DLX	Washington-Dulles	Runway 19C	FAA
ILS	I-OSZ	Washington-Dulles	Runway 1C	FAA
ILS/DME	I-EYK	Chesapeake Regional	Runway 5	DOAV
ILS/DME	I-CFU	Chesterfield County	Runway 33	DOAV
ILS/DME	I-OWN	Lonesome Pine	Runway 24	FAA
ILS/DME	I-DHY	Newport News-Williamsburg	Runway 25	FAA
ILS/DME	I-PHF	Newport News-Williamsburg	Runway 7	FAA
ILS/DME	I-JZQ	Norfolk International	Runway 23	FAA
ILS/DME	I-ORF	Norfolk International	Runway 5	FAA
ILS/DME	I-DCA	Ronald Reagan Washington	Runway 1	FAA
ILS/DME	I-RMN	Stafford Regional	Runway 33	DOAV
ILS/DME	**	Warrenton-Fauquier	Runway 15	DOAV
ILS/DME	I-IAD	Washington-Dulles	Runway 1R	FAA
ILS/DME	I-ISU	Washington-Dulles	Runway 19R	FAA
ILS/DME	I-OIU	Washington-Dulles	Runway 1L	FAA
ILS/DME	I-SGC	Washington-Dulles	Runway 19L	FAA
ILS/DME	I-TZX	Winchester Regional	Runway 32	DOAV
LDA/DME/GS	I-SZK	Roanoke Regional	Runway 6	FAA
LDA/DME	I-ASO	Washington-Dulles	Runway 19	FAA
LDA/DME	I-VWH	Ronald Reagan Washington	Runway 19	FAA
LOC	I-MFV	Accomack County	Runway 3	DOAV
LOC/DME	I-UVM	Blue Ridge	Runway 30	DOAV
LOC	I-DZH	Culpeper Regional	Runway 4	DOAV
LOC	I-JLS	Dinwiddie County	Runway 5	DOAV

System Type	Identifier	Airport Name	Approach End	Ownership
LOC	I-EMV	Emporia-Greensville	Runway 33	Local
LOC/DME	I-OFP	Hanover County	Runway 16	DOAV
LOC/DME	I-JYO	Leesburg Executive	Runway 17	DOAV*
LOC	I-LKU	Louisa County	Runway 27	Local
LOC	I-AVC	Mecklenburg-Brunswick	Runway 1	DOAV
LOC	I-MKJ	Mountain Empire	Runway 26	DOAV
LOC	I-RKH	Suffolk Executive	Runway 4	DOAV
LOC/DME	I-VJI	Virginia Highlands	Runway 24	DOAV
LOC/DME	I-BCB	Virginia Tech	Runway 12	DOAV

source: Table developed by consultant for Study using FAA AVN datasheet system (effective July 5, 2007)
** Replacement equipment at JYO in transition from DOAV ownership to FAA ownership*
*** Not commissioned*

Figure 4-3 – Localizer and Glide Slope Systems



source: Figure developed by consultant for Study using FAA AVN datasheet system (effective July 5, 2007)

APPROACH LIGHTING SYSTEMS

Currently, there are 31 approach lighting systems at the Commonwealth's airports, the majority of which are located at commercial service and reliever facilities.

Approach lighting systems are located on the approach end of a runway, significantly improve a pilot's ability to detect the landing environment, and can lower the landing visibility minimums for a runway end. The most common systems are ALSF-2, MALSR and ODALS which are briefly described below.

ALSF-2: The ALSF-2 standard approach lighting system with sequenced flashers is typically used with ILS Category II precision instrument approaches. The ALSF-2 system is normally used in conjunction with in-pavement runway centerline and touchdown zone lighting. With the use of the runway centerline and TDZ lights, visibility minimums for CAT I instrument approach procedures can be reduced to as low as 1800 RVR. Lower visibility minimums would be possible for CAT II and CAT III procedures.

MALSR: The medium intensity approach lighting system with runway alignment indicator lights has a total length of 2,400 feet. A MALSR will normally support nonprecision instrument approach minimums as low as 250 HAT and ½ statute mile or 2400 RVR. On precision approaches, MALSR normally accommodate a 200 DA and ½ statute mile or 2400 RVR minimums.

With recent changes, a MALSR may be able to support ILS minimums as low as 1800 RVR provided that (1) the runway has touchdown zone and centerline lights, or (2) aircraft are flown with flight director, HUD system or coupled to an autopilot and the threshold crossing height is 60 feet or less.

ODALS: The omnidirectional approach lighting system consists of 1,500 feet of strobe lighting. ODALS normally support nonprecision minimums as low as 250 HAT and ¾ statute mile or 4000 RVR. For approach Category D, the visibility minimums are normally 1 mile or 5000 RVR. No credit is given for ODALS with precision instrument approach procedures.

The table below summarizes the systems located on public-use airports in the Commonwealth of Virginia, the locations and the ownership.

Table 4-5 - Approach Lighting Systems

Airport Name	Identifier	System	Approach End	Ownership
Blue Ridge	MTV	ODALS	Runway 30	Local
Charlottesville-Albemarle	CHO	MALSR	Runway 3	FAA
Chesapeake Regional	CPK	MALSR	Runway 5	DOAV
Chesterfield County	FCI	MALSR	Runway 33	DOAV
Danville Regional	DAN	MALSR	Runway 2	FAA
Dinwiddie County	PTB	ODALS	Runway 5	Local
Leesburg Executive	JYO	ODALS (nstd)	Runway 17	Local
Lonesome Pine	LNP	ODALS	Runway 24	Local
Lynchburg Regional	LYH	MALSR	Runway 4	FAA
Manassas Regional	HEF	MALSR	Runway 16L	FAA
New River Valley	PSK	MALSR	Runway 6	FAA
Newport News-Williamsburg Int'l	PHF	MALSR	Runway 7	FAA
Norfolk International	ORF	MALSR	Runway 23	FAA
Norfolk International	ORF	MALSR	Runway 5	FAA
Richmond International	RIC	MALSR	Runway 2	FAA
Richmond International	RIC	ALSF 2	Runway 34	FAA
Richmond International	RIC	MALSR	Runway 16	FAA
Roanoke Regional	ROA	MALSR	Runway 33	FAA
Roanoke Regional	ROA	MALSR	Runway 6	FAA
Ronald Reagan Washington National	DCA	ALSF 2	Runway 1	FAA

Airport Name	Identifier	System	Approach End	Ownership
Ronald Reagan Washington National	DCA	MALSF	Runway 19	FAA
Shenandoah Valley Regional	SHD	MALSR	Runway 5	FAA
Stafford Regional	RMN	MALS	Runway 33	DOAV
Virginia Highlands	VJI	ODALS	Runway 24	Local
Virginia Tech	BCB	ODALS	Runway 12	Local
Washington Dulles International	IAD	ALSF 2	Runway 1R	FAA
Washington Dulles International	IAD	MALSR	Runway 1C	FAA
Washington Dulles International	IAD	ALSF 2	Runway 1L	FAA
Washington Dulles International	IAD	MALSR	Runway 12	FAA
Washington Dulles International	IAD	ALSF 2	Runway 19R	FAA
Washington Dulles International	IAD	ALSF 2	Runway 19C	FAA
Washington Dulles International	IAD	MALSR	Runway 19L	FAA
Winchester Regional	OKV	MALSR	Runway 32	DOAV

source: Table developed by consultant for Study using FAA AVN datasheet system (effective July 5, 2007)

COMMUNICATION SYSTEMS

UNICOM

Most public-use airports in Virginia are served by a UNICOM. Nontowered facilities typically use this frequency as their common traffic advisory frequency (CTAF) for aircraft position announcements. There is considerable overlap of the frequencies, with the three most popular frequencies in the Commonwealth being 122.8 (19 airports), 123.0 (12 airports), and 122.7 (11 airports).

This overlap can result in misunderstandings when pilots do not use proper announcement procedures and can also result in communications being “stepped on” during busy times on high-traffic frequencies.

CLEARANCE DELIVERY

Another important consideration is a pilot’s ability to communicate with Air Traffic Control (ATC) services for items such as clearance deliveries. For this, there are several options. The first is direct frequency communication with ATC. This is the easiest and most efficient system for pilots and controllers alike; however, it requires that the airport be geographically located in close proximity to the ATC facilities. In areas where this is not feasible, there are three available options: a remote transmitter receiver (RTR), a ground communications outlet (GCO) or telephone and void clearance times.

RTRs are unmanned communications facilities which are remotely controlled. They provide VHF communications capability to extend the service range of air traffic facilities. RTRs are normally available twenty-four (24) hours a day with direct voice communication to the controlling agency.

GCOs are unstaffed, remotely controlled, ground-to-ground communication facilities. Pilots at uncontrolled airports may contact ATC and/or flight service stations via VHF link to a standard telephone line. Pilots key the VHF radio microphone to initiate an automatic dialer. Pilots use four “key clicks” on

the radio to contact ATC or six "key clicks" to contact the flight service station. This allows pilots to obtain an instrument clearance, close a flight plan or get an updated weather briefing prior to takeoff. A GCO may be utilized at airports with low demand in order to realize reductions in telephone communications costs. Unlike a RTR, a GCO is not left continuously open for instant communication with ATC.

Table 4-6 outlines the types of clearance delivery system available at the Commonwealth's public use airports.

Table 4-6 – Clearance Delivery Communication Systems

Airport Name	ID	Direct/RTR	GCO	Phone Only	Remarks
Accomack County	MFV		●		
Blackstone Municipal	BKT			*	
Blue Ridge	MTV	●			RTR
Bridgewater Air Park	VBW			*	
Brookneal-Campbell County	0V4			*	
Charlottesville-Albemarle	CHO	●			ATCT
Chase City Municipal	CXE			*	
Chesapeake Regional	CPK		●		GCO reported problematic
Chesterfield County	FCI	●			RTR
Crewe Municipal	W81			*	
Culpeper Regional	CJR		●		
Danville Regional	DAN	●			RTR
Dinwiddie County	PTB		●		GCO reported problematic
Emporia-Greensville Regional	EMV			*	
Falwell	W24			*	
Farmville Regional	FVX		●		
Franklin Municipal	FKN		●*	●*	GCO NOTAM'd unreliable
Front Royal-Warren County	FRR			*	
Gordonsville Municipal	GVE			*	
Grundy Municipal	GDY			*	
Hampton Roads Executive	PVG			●	
Hanover County Municipal	OFP	●			RTR
Hummel Field	W75			*	
Ingalls Field	HSP	●			
Lake Anna	7W4			●	
Lawrenceville-Brunswick	LVL			●	
Lee County	0VG			●	
Leesburg Executive	JYO	●			RTR
Lonesome Pine	LNP	●			
Louisa County	LKU			●	
Lunenburg County	W31			●	
Luray Caverns	W45			●	
Lynchburg Regional	LYH	●			ATCT

Airport Name	ID	Direct/RTR	GCO	Phone Only	Remarks
Manassas Regional	HEF	●			ATCT
Marks Municipal	W63			●	
Mecklenburg-Brunswick Regional	AVC		●		GCO not shown in AFD
Middle Peninsula Regional	FYJ			*	
Mountain Empire	MKJ			*	
New Kent County	W96		●		GCO reported problematic
New London	W90			*	
New Market	8W2			*	
New River Valley	PSK	●			RTR
Newport News-Williamsburg Int'l	PHF	●			ATCT
Norfolk International	ORF	●			ATCT
Orange County	OMH			*	
Richmond International	RIC	●			ATCT
Roanoke Regional	ROA	●			ATCT
Ronald Reagan Washington National	DCA	●			ATCT
Shannon	EZF		●*	**	GCO OTS indef.
Shenandoah Valley Regional	SHD	●			Reported 'somewhat' reliable
Smith Mountain Lake	W91			*	
Stafford Regional	RMN		●		
Suffolk Executive	SFQ		●		
Tangier Island	TGI			●	
Tappahannock-Essex County	XSA			●	
Tazewell County	6V3		●		
Twin County	HLX		●	●	GCO reported problematic
Virginia Highlands	VJI	●			Reported 'somewhat' reliable
Virginia Tech	BCB	●			Phone line rep. problematic
Wakefield Municipal	AKQ			*	
Warrenton-Fauquier	HWY		●		
Washington Dulles International	IAD	●			ATCT
Waynesboro	W13			●	
William M. Tuck	W78			*	
Williamsburg-Jamestown	JGG		●		
Winchester Regional	OKV	●			RTR

source: Table developed by consultant for Study using FAA Airport/Facility Directory data (effective July 5, 2007), and supplemental information provided by airport managers and pilots

** unconfirmed*

*** phone unconfirmed, until GCO is returned to service*

As part of the Study, the management of each of the public-use airports in the Commonwealth was given an opportunity to provide information about their facilities. The questions were varied and results were provided to the DOAV in a separate Reference Document. One of the questions covered pilots' methods for obtaining instrument clearances while on the ground. Six airport respondents reported availability of GCOs; of the six airports, five reported problems with the system. Most noted that "even experienced users have trouble operating the line (with mic clicks)". Identified problems included equipment siting and reliability.

In order to initiate an instrument approach procedure, the pilot must be able to receive an altimeter setting from the source published in the procedure. The landing minimums for an approach will be higher if the altimeter source is not located on the airport. For this reason, it is desirable to have a *local* altimeter source in order to avoid the Remote Altimeter Setting Source (RASS) penalty.

If the local altimeter setting source is not available 24 hours a day, an alternate altimeter setting source will be published on the procedure. When an alternate altimeter source is used, the MDA/DA is raised.

In addition, regulations require certain operators to obtain *local* weather information before initiating an instrument approach procedure under Instrument Flight Rules (IFR). These regulations apply to air carriers and commercial operators operating under FAR Part 121 and to charter operators operating under FAR Part 135.

There are a number of options available to meet the altimeter setting and weather reporting requirements, including Automated Surface Observing Systems (ASOS) and various types of Automated Weather Observing Systems (AWOS).

The systems automatically measure one or more weather parameters, analyze the data and prepare weather observations. Depending upon the system, observations are available to pilots by VHF radio and telephone. Additionally, many systems are networked via phone and/or satellite into the National Airspace Data Interchange Network, or NADIN. This allows pilots to access the weather observations using a variety of platforms including the internet and in-cockpit flight information systems.

An AWOS can incorporate a variety of weather sensors. The standard sensor configurations are:

Table 4-7 – Standard AWOS Sensor Configurations

		Present Weather (P)	Lighting Detection (T)	Freezing Rain Detection (Z)	Runway Condition Sensor (R)
AWOS A	Measures barometric pressure, reports altimeter setting				
AWOS A-V	AWOS A plus Visibility				
AWOS I	Wind (speed, gust, direction, variable direction), Temperature, Dew Point, Altimeter Setting, Density Altitude				
AWOS II	AWOS I plus Visibility / Variable Visibility				
AWOS III	AWOS II plus Cloud Height and Sky Condition				
AWOS III + ID	AWOS III plus up to three additional sensors (see columns on right)	**P**	**T**	**Z**	**R**
AWOS IV	AWOS III plus additional four sensors (see columns on right)	●	●	●	●

source: Table developed by consultant using information from FAA Program Guidance Letter 08-05

An ASOS is a system similar to the AWOS and is a joint effort of the National Weather Service, the FAA and the Department of Defense.

Table 4-8 – Weather Reporting Systems

Airport Name	Identifier	Type	NADIN	Note
Accomack County	MFV	AWOS III - PT	✓	FAA does not show P, T
Blackstone Municipal	BKT			
Blue Ridge	MTV	AWOS III - P	✓	
Bridgewater Air Park	VBW			
Brookneal-Campbell County	0V4			
Charlottesville-Albemarle	CHO	ASOS	✓	
Chase City Municipal	CXE			
Chesapeake Regional	CPK	AWOS III - PT	✓	FAA does not show P, T
Chesterfield County	FCI	AWOS III	×	
Crewe Municipal	W81			
Culpeper Regional	CJR	AWOS III - PT	✓	
Danville Regional	DAN	ASOS	✓	
Dinwiddie County	PTB	AWOS III - PT	✓	FAA does not show P, T
Emporia-Greensville Regional	EMV	AWOS III - PT	✓	FAA does not show P, T
Falwell	W24			
Farmville Regional	FVX	AWOS III - P	✓	FAA does not show P
Franklin Municipal	FKN	AWOS III	✓	
Front Royal-Warren County	FRR			
Gordonsville Municipal	GVE			
Grundy Municipal	GDY			
Hampton Roads Executive	PVG	AWOS III	×	
Hanover County Municipal	OFP	ASOS	✓	
Hummel Field	W75			
Ingalls Field	HSP	AWOS III	✓	
Lake Anna	7W4			
Lawrenceville-Brunswick	LVL			
Lee County	0VG	AWOS III		underway
Leesburg Executive	JYO	AWOS III - PT	✓	FAA does not show T
Lonesome Pine	LNP	AWOS III	✓	
Louisa County	LKU	AWOS III - P	✓	FAA does not show P
Lunenburg County	W31			
Luray Caverns	W45			
Lynchburg Regional	LYH	ASOS	✓	
Manassas Regional	HEF	AWOS III	✓	
Marks Municipal	W63			
Mecklenburg-Brunswick Regional	AVC	AWOS III - PT	✓	FAA does not show P, T
Middle Peninsula Regional	FYJ	AWOS III - P	✓	FAA does not show P
Mountain Empire	MKJ	AWOS III	✓	
New Kent County	W96			

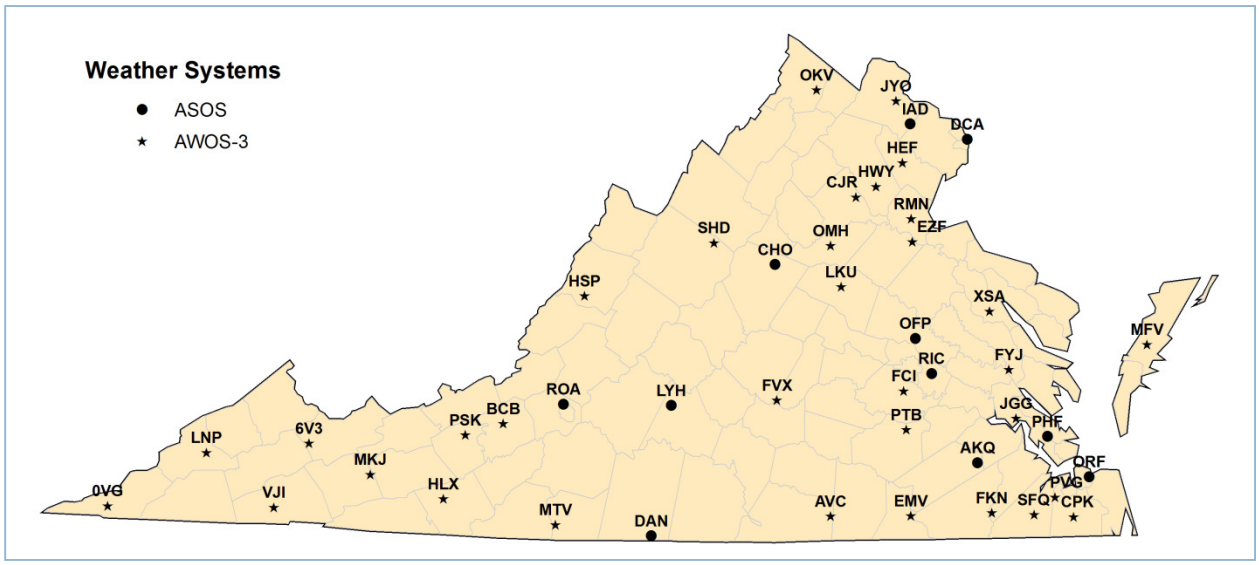
Airport Name	Identifier	Type	NADIN	Note
New London	W90			
New Market	8W2			
New River Valley	PSK	AWOS III - PT	✓	FAA does not show P, T
Newport News-Williamsburg Int'l	PHF	ASOS	✓	
Norfolk International	ORF	ASOS	✓	
Orange County	OMH	AWOS III	✓	
Richmond International	RIC	ASOS	✓	
Roanoke Regional	ROA	ASOS	✓	
Ronald Reagan Washington National	DCA	ASOS	✓	
Shannon	EZF	AWOS III	✓	
Shenandoah Valley Regional	SHD	AWOS III - PT	✓	
Smith Mountain Lake	W91			
Stafford Regional	RMN	AWOS III - PT	✓	
Suffolk Executive	SFQ	AWOS III - PT	✓	FAA does not show P, T
Tangier Island	TGI			
Tappahannock-Essex County	XSA	AWOS III - P	✓	
Tazewell County	6V3	AWOS III	✓	
Twin County	HLX	AWOS III	✓	
Virginia Highlands	VJI	AWOS III	✓	
Virginia Tech	BCB	AWOS III - PT	✓	FAA does not show P, T
Wakefield Municipal	AKQ	ASOS	✓	
Warrenton-Fauquier	HWY	AWOS III		ASOS on 5010, not on FAA site
Washington Dulles International	IAD	ASOS	✓	
Waynesboro	W13			
William M. Tuck	W78			
Williamsburg-Jamestown	JGG	AWOS III	✓	
Winchester Regional	OKV	AWOS III - PT	✓	FAA does not show T

source: Table developed by consultant using information from FAA web site and DOAV records

✓ - Weather Reporting System in NADIN

- Weather Reporting System not in NADIN

Figure 4-4 – Weather Systems



source: Figure developed by consultant using information from FAA website and DOAV records

SURVEILLANCE SYSTEMS

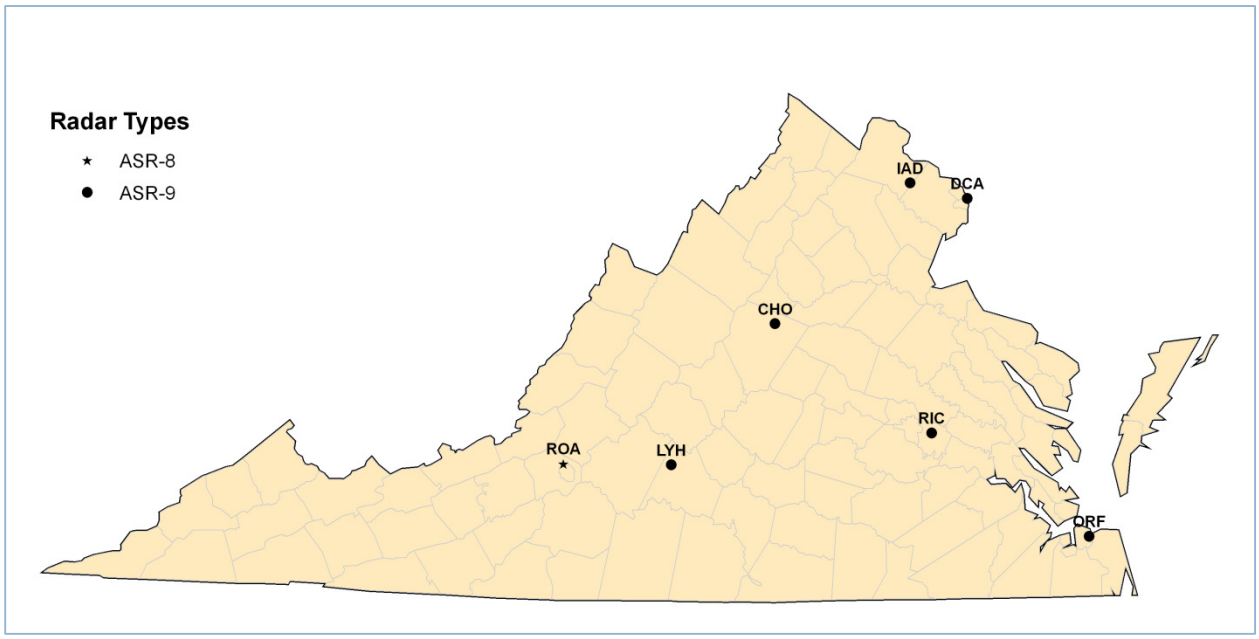
Currently there are seven radar sites at non-military facilities in Virginia, as listed in the following table. Additionally, there are radar sites at Davidson AAF (DAA), Felker AAF (FAF), Langley AFB (LFI), Chambers (NGU), Oceana NAS (NTU) and Quantico (NYG).

Figure 4-5 – Radar Locations

Airport Name	Identifier	System
Charlottesville-Albemarle	CHO	ASR-9
Lynchburg Regional	LYH	ASR-9
Norfolk International	ORF	ASR-9
Richmond International	RIC	ASR-9
Roanoke Regional	ROA	ASR-8
Ronald Reagan Washington National	DCA	ASR-9
Washington Dulles International	IAD	ASR-9

source: Table developed by consultant using information from FAA AVN datasheet system (effective July 5, 2007)

Figure 4-6 – Radar Locations



source: Table developed by consultant using information from FAA AVN datasheet system (effective July 5, 2007)

EQUIPMENT CONDITION ASSESSMENTS

In February, 2008 the Consultant Team prepared a survey to assess the condition of Commonwealth-owned facilities and equipment. The survey was distributed to Austin Electric and ILS Tech Services, the two firms that provide maintenance throughout the Commonwealth as part of separate contracts with the DOAV.

As part of the survey, the maintenance technicians were asked to subjectively evaluate (based on their experience with the equipment) the physical condition, reliability, and useful life remaining.

Physical condition was assessed using the following guidelines:

- Excellent – no none deficiencies
- Good – normal wear and tear may cause components to need replacement in mid-term (18 to 36 months)
- Fair – normal wear and tear may cause components to need replacement in near term (within 18 months)
- Poor – recurrent problems with this equipment

Reliability was assessed using the following guidelines:

- Excellent – no outages during a typical year
- Good – one outage during a typical year (6 hours or less)
- Fair – 6 to 72 hours of outages during a typical year
- Poor – more than 72 hours of outages during a typical year

Estimated useful life remaining was assessed using the following guidelines:

- Needs replacing as soon as practical
- 0 to 3 years
- 3 to 5 years
- 5 to 10 years
- 10+ years

A summary of the responses is presented below.

LOCALIZERS / GLIDE SLOPES

Of the Commonwealth-owned localizer and glide slope systems, the majority were reported to have 'good' to 'excellent' reliability. However, several of the facilities were reported as 'fair' or 'poor'. The Consultant Team believes that outages of more than six hours in a typical year are cause for concern. The facilities in this category include:

Accomack County Airport – Localizer (ASII – 1100 – LOC)
Blue Ridge Airport – Localizer (ASII – 1100 – LOC)
Chesapeake Regional Airport – Glide Slope (ASII – 2100 – GS)
Chesterfield County Airport – Glide Slope (Wilcox MK 10 – GS)
Emporia-Greensville Regional Airport – Localizer (ASII – 1100 – LOC)
Mecklenburg-Brunswick Regional Airport – Localizer (ASII – 1100 – LOC)
Stafford Regional Airport – Localizer (ASII – 2100 – LOC)

The surveys identified the most critical needs as the Accomack County localizer, the Emporia-Greensville Regional localizer and the Mecklenburg-Brunswick localizer.

DME

Of the DME systems, all except for one were reported to have 'good' to 'excellent' reliability. The system of concern is located at Hanover County Airport. Subsequent evaluation by the DOAV revealed that the DME located at Hanover County Airport is in good condition.

The condition surveys also identified a number of systems as having five or fewer years of useful life remaining. These systems include Blue Ridge, Tazewell, Virginia Tech and Winchester DME.

NDB / MARKER BEACONS

Seven of the NDBs in the System were reported to have significant reliability concerns resulting in a 'fair' assessment. These facilities include Bridgewater, Farmville, Mecklenburg-Brunswick, Mountain Empire, Suffolk, Virginia Highlands and Wakefield.

Additionally, both the NDB and the marker beacon at Blue Ridge were identified as needing replacement immediately due to physical condition and maintenance concerns.

EQUIPMENT SHELTERS

Several of the equipment shelters throughout the Commonwealth are believed to be in 'poor' condition. The shelters include Blue Ridge marker beacon shelter, Blue Ridge NDB shelter, and Winchester GS/DME shelter.

CHAPTER 5 - RECOMMENDATIONS FOR SYSTEM-WIDE IMPROVEMENTS

Recommendations for improvements to the Commonwealth's air transportation system can be developed in two distinct ways: top-down and bottom-up. For this portion of the Study, the Consultant Team worked with the Technical Committee and Advisory Committee to take a *top-down*, or system view, approach to recommendations.

SYSTEM CONSIDERATIONS

The top priority for the Commonwealth is the safety of its air transportation system. Beyond pilot abilities, the safety of instrument flying depends upon many elements, including:

- reliable and accurate position information and guidance (navigational aids),
- presence of lighting and visual aids,
- accurate, readily-available information regarding procedures, facilities, equipment, and weather,
- reliable communications (with air traffic and other aircraft), and
- clear, hazard-free approaches.

Each of these elements must be considered by the Federal Aviation Administration (FAA), Virginia Department of Aviation (DOAV) and airport Sponsors when developing airport facilities and instrument approach procedures.

GROUND-BASED NAVIGATION

GROUND-BASED APPROACH NETWORK

Currently, the Commonwealth of Virginia has a robust network of ground-based instrument approach procedures. While GPS has afforded a terrific opportunity to increase the accessibility of all airports throughout the system, the Study Team believes that it remains important to maintain a skeleton ground-based approach network in the event of in-aircraft equipment failure or a prolonged GPS outage. GPS outages can result from satellite reliability or maintenance issues, solar flares and intentional or unintentional frequency interference.

It is proposed that all Virginia Air Transportation System Plan (VATSP) Commercial Service, Reliever, General Aviation–Regional, and General Aviation–Community airports maintain a ground-based instrument approach procedure to at least one runway end.

VOR COVERAGE

The existing VOR, VOR/DME and VORTAC coverage in the Commonwealth is good. No additional sites are recommended; however, the majority of sites have unusable radials. Chapter 4 "Equipment Inventory" includes further information on this topic.

Ideally, all existing VORs would be upgraded to bring the system to its full capacity. However, it is recognized that the FAA is not currently placing a high priority on these repairs and the DOAV has limited influence over the prioritization of repairs. With this in mind, it is recommended that the DOAV focus on those facilities which have widespread use or serve a unique need. The following facilities are recommended for primary focus: Gordonsville VORTAC (GVE), Richmond VORTAC (RIC), Lynchburg VORTAC (LYH), and Casanova VORTAC (CSN).

NDB COVERAGE

NDBs are currently being phased out across the nation, and the Commonwealth of Virginia has experienced a number of NDB decommissionings throughout the last year. No exception is taken to this strategy; however, it is vital that the decommissioning of the facilities be coordinated with sufficient advance notice to allow for the processing of any necessary procedure modifications or development of new instrument approach procedures.

When a facility is slated for decommissioning, it is vital that area instrument approach procedures be reviewed to determine which procedures rely on the NDB for either aircraft positioning information (initial or final approach fixes). It is also important for the review to identify any airports which will lose the only ground-based approach to a given runway end.

In anticipation of widespread decommissioning of NDB facilities, the Recommendations for Individual Airport Improvements chapter (Chapter 6) includes recommendations for procedure modifications and new procedures to eliminate the reliance on the NDB network.

MAINTENANCE / REPLACEMENT OF COMMONWEALTH-OWNED EQUIPMENT

As evidenced by the Condition Assessments presented in Chapter 4, the Commonwealth-owned equipment is largely in good, operative condition.

- It is recommended that the DOAV continue its robust maintenance program. Maintenance should continue to be an important focus with funding levels adjusted, as needed, to ensure that critical maintenance needs are met across the system.

- The condition survey results identified the most problematic localizers as Accomack, Emporia and Mecklenburg (each ASII – 1100s); accordingly, these are recommended for near-term replacement. A review of equipment inventory shows that the Blue Ridge localizer is also an ASII – 1100. Since this equipment has a history of problems, the Blue Ridge localizer is also recommended for near-term replacement.

- The condition survey results identified several systems that are estimated to be near the end of their useful life. Notably, the FAA is no longer servicing the Wilcox 596C DME

systems. Therefore, the aforementioned DMEs (Blue Ridge, Tazewell, Virginia Tech, Winchester) and also those at Chesterfield County and Leesburg Executive should be replaced in the near-term. The Commonwealth's contract maintenance personnel report better reliability with the Thales/Wilcox MK20A systems, and recommend those for consideration in the future.

- The condition survey results identified problematic NDB / Marker Beacon systems. Seven of the NDBs in the System were reported to have significant reliability concerns resulting in a 'fair' assessment. These facilities include Bridgewater, Farmville, Mecklenburg-Brunswick, Mountain Empire, Suffolk, Virginia Highlands and Wakefield. These are recommended for near-term replacement if the approach analysis indicates that maintaining the facilities is integral to the design of the instrument approach procedures. Additionally, both the NDB and the marker beacon at Blue Ridge were identified as needing replacement immediately due to physical condition; however, it is recognized that reliability of the equipment has not been a concern historically.

- Several of the equipment shelters throughout the Commonwealth are believed to be in 'poor' condition, as indicated in the condition survey results. It is recommended that these shelters be rehabilitated or replaced in the near term. The shelters include Blue Ridge marker beacon shelter, Blue Ridge NDB shelter, and Winchester GS/DME shelter.

SATELLITE-BASED APPROACHES

The Commonwealth has 80 satellite-based instrument approach procedures to 47 airports. However, there are only 17 VNAV procedures and 12 LPV procedures. It is highly recommended that additional satellite-based approaches be developed for additional system-wide coverage. These recommendations are further detailed in Chapter 6, "Individual Airport Recommendations".

WEATHER REPORTING SYSTEMS

Weather information is vital for safe flight operations, and the Commonwealth currently has a robust network of weather reporting systems. To enhance coverage throughout the System, it is recommended that three AWOS III facilities be installed at the following locations: William M. Tuck, South Boston (W78); Luray Caverns, Luray (W45); and Tangier Island, Tangier (TGI).

As shown in Chapter 4, not all of the AWOS facilities in the Commonwealth have been connected to the National Airspace Data Interchange Network (NADIN). This connectivity is vital to the pilot community, as it makes the weather information available through a wide array of sources. It is highly recommended that all existing and future AWOS III installations be connected to the NADIN.

For the AWOS-III facilities in the Commonwealth, optional sensors are available that provide pilots with present weather (P), lighting detection (T) and freezing rain detection (Z). It is recommended that all existing and future AWOS-III installations be equipped with the present weather (P) and lighting detection (T) sensors.

SURVEILLANCE SYSTEMS

Improved terminal area radar is recommended in several areas of the Commonwealth. Specifically:

- the easternmost part of the Commonwealth would benefit from the commissioning of the Wallops Island Radar,
- the northwestern part of the Commonwealth would benefit from improved radar coverage serving the Shenandoah Valley, and
- the western portion of the Commonwealth would benefit from improved radar coverage in the sectors north and west of Roanoke.

COMMUNICATION SYSTEMS

Each of the System airports has a Common Traffic Advisory Frequency (CTAF) allowing communication between equipped aircraft using the facility. It is recommended that any new airports in the Commonwealth should be similarly equipped.

With regard to communications with Air Traffic personnel, as identified in Chapter 4, over 20 of the airports in the Commonwealth are served by Remote Transmitter Receivers (RTRs) or have direct through the air access to Air Traffic Control services. Another 15 facilities have Ground Communication Outlets (GCOs); however, many are unreliable or problematic. It is recommended that direct or RTR communications be provided at the busiest of the system airports and that upgraded GCO systems be reserved for those facilities with fewer operations.

AIRSPACE

Airspace which is free and clear of hazards should remain both a DOAV and Sponsor priority. Current FAA policy requires an aeronautical survey prior to the development of a new instrument approach procedure (standards vary depending upon procedure type). These surveys provide valuable information regarding the airspace surrounding a facility.

Currently, the DOAV contracts for the completion of “photoslope” surveys which analyze the approach surfaces and seek to identify existing obstructions to various airspace surfaces. The DOAV also provides financial assistance through its funding programs for the removal of obstructions.

For the importance of the total System, is recommended that the DOAV continue to develop programs which assist Sponsors with understanding the airspace surrounding their airports. The following are recommended for development by the DOAV:

- Airspace Overview (document explaining airspace and affects that hazards can have on airport operations)
- Planning / Zoning Guidance (document containing sample language for consideration and adoption by local municipalities)

- Understanding the 7460 "Notice of Proposed Construction or Alteration" Process (document outlining the airspace notification process and the important role that the Sponsor and the airport layout documents play)
- Additional Educational Programs (conference and workshop programs)

FUTURE TECHNOLOGIES

Chapter 8 provides an overview of many of the surveillance, navigation, automation, communications and weather technologies that are anticipated by the FAA in the 20 year planning period. However, in the context of system-wide improvements, the Local Area Augmentation System (LAAS) and automatic detection surveillance broadcasting (ADS-B) are of particular interest.

LOCAL AREA AUGMENTATION

As mentioned in Chapter 3, the LAAS is a ground-based augmentation to GPS that focuses its service on the airport area (approximately a 20-30 mile radius) for precision approach, departure procedures and terminal area operations. It broadcasts its correction message via a very high frequency (VHF) radio data link from a ground-based transmitter. LAAS will yield the extremely high accuracy, availability, and integrity necessary for Category I, II, and III precision approaches, and will provide the ability for flexible, curved approach paths. LAAS demonstrated accuracy with less than 1 meter of error in both the horizontal and vertical axis.

LAAS is currently a Research and Development (R&D) project focusing on the resolution of outstanding integrity and safety issues to reduce risk for future development. The FAA Ground-Based Augmentation System (GBAS) office is currently working with the industry in anticipation of the certification of the first prototype LAAS ground station in Memphis, TN.

Once LAAS becomes certified for widespread operation, it is recommended that 28 of the System airports be equipped with the necessary augmentation equipment to enable the development of precision approaches. With proper siting, multiple airports may be served from a single LAAS unit.

AUTOMATIC DEPENDENT SURVEILLANCE BROADCAST (ADS-B)

It is recommended that the DOAV continue to strongly embrace the wide-spread implementation of Automatic Dependent Surveillance Broadcast (ADS-B). ADS-B will improve the situational awareness of both the air traffic controller and the pilot in the cockpit. A more detailed description of ADS-B follows in Chapter 7.

It is expected that the FAA-provided ADS-B coverage to the surface is only planned for Class B airports (airspace). It is expected that coverage will reach to approximately 2000 AGL in other areas of the Commonwealth. Accordingly, the Study recommends augmentation, as necessary, to meet identified goals.

SERVICE LEVEL BASED RECOMMENDATIONS

For the purposes of developing system-wide guidelines for instrument approach related facilities and equipment, the existing VATSP service levels were reviewed and used as a basis for the formulation of system benchmarks. The current VATSP has five service levels. For the purposes of this Study, the five service levels were further divided and the result is a series of nine service levels, as identified below.

Table 5-1 – Service Level Categories

Existing VATSP Service Levels (5 levels)	Study Service Levels (9 levels)
Commercial Service (CS)	Commercial Service (>= 1 million enplanements)
	Commercial Service (<1 million, >= 200,000 enplanements)
	Commercial Service (< 200,000 enplanements)
Reliever (RL)	Reliever
General Aviation – Regional (GR)	Regional (1/2 mile visibility)
	Regional (3/4 mile visibility)
	Regional (1 mile visibility)
General Aviation – Community (GC)	Community
General Aviation – Local Service (LO)	Local

source: Consultant Recommendation

In the case of the Commercial Service category, the further division reflects the wide range of commercial service airports existing in the Commonwealth. This allows for increased instrumentation to be recommended at the busiest commercial service facilities.

In the case of the General Aviation – Regional category, the further division is used to divide the Regional airports into three tiers reflecting a combination of a facility's operations as well as the facility's ability to accommodate the protective surfaces that are required by FAA guidance. To illustrate, when an airport has an instrument approach procedure with ½ mile visibility, current guidelines require a primary surface of 1,000 feet (500 feet on either side of the runway centerline) and an increased runway protection zone (RPZ). Many airports cannot physically accommodate this requirement because of terrain or existing infrastructure. Similarly, to achieve ¾ mile visibility for an approach procedure requires an approach lighting system. Some airports cannot physically accommodate this requirement – again because of terrain or existing infrastructure or land use in the approach areas of the runway. Changes to airport facilities and instrument approach procedures must be carefully planned and coordinated with the representatives at the FAA Airports District Office and the DOAV. There are significant changes when the landing visibility is reduced and the airport Sponsor shall obtain positive land use control prior to implementing a new instrument approach.

For purposes of this Study and the resulting System Benchmarks, the Commonwealth's airports have been divided into the Study Service Level categories as follows:

Table 5-2 – Airports by Service Level Categories

Study Service Level	Airport
Commercial Service (>= 1 million enplanements)	Norfolk International Airport Reagan National Airport Richmond International Airport Washington-Dulles International Airport
Commercial Service (<1 million, >= 200,000 enplanements)	Charlottesville-Albemarle Airport Newport News-Williamsburg Airport Roanoke Regional Airport
Commercial Service (< 200,000 enplanements)	Lynchburg Regional Airport Shenandoah Valley Regional Airport
Reliever	Chesapeake Regional Airport Chesterfield County Airport Hampton Roads Executive Airport Hanover County Airport Leesburg Executive Airport Manassas Regional Airport Stafford Regional Airport Warrenton Fauquier Airport
Regional (1/2 mile visibility)	Danville Regional Airport Lonesome Pine Airport New River Valley Airport Winchester Regional Airport
Regional (3/4 mile visibility)	Accomack County Airport Blue Ridge Airport Culpeper Regional Airport Dinwiddie County Airport Ingalls Field Middle Peninsula Regional Airport Suffolk Executive Airport
Regional (1 mile visibility)	Emporia Municipal Airport Farmville Municipal Airport Mecklenburg Brunswick Airport Mountain Empire Airport Tappahannock Essex County Airport Tazewell County Airport Virginia Highlands Airport Virginia Tech Airport *(suggested role change)* William Tuck Airport
Community	Blackstone AAF Brookneal-Campbell County Airport Franklin Municipal Airport Front Royal-Warren County Airport Lee County Airport Louisa County Airport Luray Caverns Airport Marks Municipal Airport

	New Kent County Airport Orange County Airport Shannon Airport Tangier Island Airport Twin County Airport Wakefield Municipal Airport Williamsburg Jamestown Airport
Local	Bridgewater Air Park Chase City Municipal Airport Crewe Municipal Airport Grundy Municipal Airport Falwell Airport Gordonsville Municipal Airport Hummel Field Lake Anna Airport Lawrenceville Brunswick County Airport Lunenburg Municipal Airport New London Airport New Market Airport Smith Mountain Lake Airport Waynesboro / Eagles Nest Airport

source: Consultant Recommendation

SYSTEM BENCHMARKS

DEVELOPMENT OF SYSTEM BENCHMARKS

The Consultant Team, in coordination with the Technical Committee, developed draft benchmarks for review, discussion and comment by the Advisory Committee. Additionally, the benchmarks were presented to the Virginia Airport Operators Council and the Virginia Aviation Board for their review and comment.

The resulting recommendations are designed to represent 'reach' goals for each of the service level categories. Very few facilities currently meet the majority of the goals for their category; however, the goals are believed to be obtainable for the vast majority of the airports during the 20 year planning horizon.

The benchmarks for each of the categories are presented below as System Benchmarks.

Table 5-3 – System Benchmarks: Instrument Approach Types and Minima

	Best Approach (primary runway end)		Secondary Approach (different runway end)		ALL Ends of Instrument Runways***	
	Type	**Minimums**	**Type**	**Minimums**	**Type**	**Minimums**
Commercial Service (>= 1 million enplanements)	ILS CAT III	100 – 1200	ILS CAT I	200 – 1800	Ground-based	400 – 1
	LPV and LAAS	200 – 1800	LPV and LAAS	200 – 1800	LPV and LAAS	400 – 1
Commercial Service (<1 million, >= 200,000 enplanements)	ILS CAT I	200 – 1800	ILS CAT I	200 – 2400*	Ground-based	400 – 1
	LPV and LAAS	200 – 1800	LPV and LAAS	200 – 2400*	LPV and LAAS	400 – 1
Commercial Service (< 200,000 enplanements)	ILS CAT I	200 – 2400*	Ground-based	400 – 3/4		
	LPV and LAAS	200 – 2400*	LPV and LAAS	250 – 3/4	LPV and LAAS	400 – 1
Reliever	ILS CAT I	200 – 1/2	Ground-based	400 – 3/4		
	LPV and LAAS	200 – 1/2	LPV and LAAS	250 – 3/4	LNAV	400 – 1
Regional (1/2 mile visibility)	ILS CAT I	200 – 1/2	Ground-based	400 – 1		
	LPV and LAAS	200 – 1/2	LPV and LAAS	250 – 1	LNAV	400 – 1
Regional (3/4 mile visibility)	Ground-based	400 – 3/4	Ground-based	400 – 1		
	LPV and LAAS	250 – 3/4	LPV and LAAS	250 – 1	LNAV	400 – 1
Regional (1 mile visibility)**	Ground-based	400 – 1				
	LPV	250 – 1	LNAV	400-1	LNAV	400 – 1
Community**	Ground-based	500 – 1				
	LNAV	400 – 1	LNAV	500 - 1		
Local	case-by-case					

source: Consultant Recommendation

**1800 RVR for aircraft equipped with approved flight director, HUD or coupled autopilot systems.*

*** For Regional (1 mile visibility) and Community airports, the best ground-based approach may not be on the same runway end as the best GPS approach.*

****Instrument runways must be paved and in a condition appropriate to support instrument operations.*

Table 5-4 – Instrumentation Required to Meet System Benchmarks – PART 1

	Best Approach (primary runway end)	Secondary Approach (different runway end)	ALL Other Ends of Instrument Runways
Commercial Service (>= 1 million enplanements)	ALSF-2, TDZ, CL, HIRLs, RVR, PAPI	ALSF-2 or MALSR, TDZ, CL, HIRLs, RVR, PAPI	REILs, HIRLs, PAPI
Commercial Service (<1 million, >= 200,000 enplanements)	ALSF-2 or MALSR, TDZ, CL, HIRLs, RVR, PAPI	ALSF-2 or MALSR, TDZ, CL, HIRLs, RVR, PAPI	REILs, HIRLs, PAPI
Commercial Service (< 200,000 enplanements)	MALSR, HIRLs, RVR, PAPI	MALS, HIRLs, PAPI	PAPIs, MIRLs, REILs
Reliever	MALSR, HIRLs, PAPI	MALS, HIRLs, PAPI	REILs, MIRLs, PAPI
Regional (1/2 mile visibility)	MALSR, HIRLs, PAPI	REILs, HIRLs, PAPI	REILs, MIRLs, PAPI
Regional (3/4 mile visibility)	MALS, HIRLs, PAPI	REILs, HIRLs, PAPI	REILs, MIRLs, PAPI
Regional (1 mile visibility)	REILs (or approach lights), MIRLs, PAPI	REILs, MIRLs, PAPI	REILs, MIRLs, PAPI
Community	REILs, MIRLs, PAPI	REILs, MIRLs, PAPI	REILs, MIRLs, PAPI

source: Consultant Recommendation

Table 5-5 – Instrumentation Required to Meet System Benchmarks – PART 2

	Weather	Access to ATC Clearance	LAAS	ADS B Coverage
Commercial Service (>= 1 million enplanements)	on-field, 24/7, data-linked	Direct	Yes	On ground
Commercial Service (<1 million, >= 200,000 enplanements)	on-field, 24/7, data-linked	Direct	Yes	On ground
Commercial Service (< 200,000 enplanements)	on-field, 24/7, data-linked	Direct or RTR	Yes	On ground
Reliever	on-field, 24/7, data-linked	RTR	Yes	On ground
Regional (1/2 mile visibility)	on-field, 24/7, data-linked	RTR	Yes	On ground
Regional (3/4 mile visibility)	on-field, 24/7, data-linked	RTR	Yes	On ground
Regional (1 mile visibility)	on-field, 24/7, data-linked	RTR or GCO		On ground
Community	Normally on field, 24/7, data-linked*	RTR or GCO		1000 AGL

source: Consultant Recommendation

**AWOS-A or better in all cases*

The recommendations presented herein are intended to serve as an independent study prepared for the DOAV's review and consideration. These recommendations are not intended to take the place of individual airport master plans, environmental or capital improvement planning processes. The contents of this Study do not reflect the official views of the FAA or DOAV, nor are the FAA and DOAV endorsing the Study's recommended improvements and timelines for programming and funding.

If an airport Sponsor would like to pursue improvements contained in this Study, they should work with their representatives at the FAA Airports District Office and the DOAV to develop a mutually acceptable development program. All improvements will be required to meet FAA Airport Improvement Program (AIP) eligibility requirements if Federal AIP funding is desired.

Airport Design Standards

Under current FAA guidance, there are two primary areas where airport design and instrument approach procedures are related.

For new instrument approach procedures, Advisory Circular 150/5300-13, Appendix 16 provides an overview of required standards. These standards are categorized based on type of approach (precision, vertical guidance, nonprecision) and landing visibility minimum. The standards include elements such as protection surfaces, runway width, and runway marking/lighting.

Chapters Two and Three of the same advisory circular also provide detailed guidance about airport geometry and runway design. In many cases, the guidance is predicated by the lowest visibility minimum available to a specific runway end. For instance, runway protection zone (RPZ) dimensions and runway centerline separation criteria are impacted by visibility minimum. Runway design characteristics also vary depending upon visibility. These include obstacle free zones, object free areas, runway width, runway shoulders and runway safety areas.

Changes to airport facilities and instrument approach procedures must be carefully planned and coordinated. There are significant differences in design criteria and required standards when a runway moves from a nonprecision to precision approach. There are also significant changes when the landing visibility drops from 1 mile to ¾ statute miles.

New Navigational and Lighting Aids

All new navigational and lighting aids should be evaluated in accordance with FAA Order 7031.2C "Airway Planning Standard Number 1 – Terminal Air Navigation Facilities and Air Traffic Control Services, "FAA Publication FAA-APO-8310 "Establishment and Discontinuance Criteria for Precision Landing Systems" and FAA Order 5100.38C "Airport Improvement Program Handbook" regarding FAA funding eligibility.

New Procedure Process / Timeline

Many new instrument approach procedures are recommended as part of this process. For the development of new approaches, the FAA, DOAV and Sponsor must work hand-in-hand. While either the DOAV or the Sponsor can initiate the request for a new procedure, it is important to recognize that it is a multi-step process that involves obstruction surveys, airspace coordination and flight checks.

Currently, the Flight Procedures branch of the FAA is advising the aviation community to allow approximately 18 to 24 months from initiation to publication of new flight procedures.

Best Available Approach
This element refers to the runway end with the best available approach. Best available typically refers to best landing minimums, but can also refer to type of approach (ILS preferred over NDB, for instance). Goals for approach types and associated landing minimums have been specified.

Typically, one runway end will have the best ground-based as well as the best satellite-based approach; however, for Regional (1 mile visibility) and Community airports, this may not be the case.

Alternate Approach
This element refers to a secondary runway end -- not necessarily the opposite end of the 'best' runway (although for single runway airports this would obviously be the case). Goals for approach types and associated landing minimums have been specified.

All Ends of Instrument Runways
For airports with multiple runways, an additional element applies. This element provides goals for approach types and associated landing minimums for all remaining runway ends at a facility. The runway must be paved and in a condition appropriate for instrument operations. Visual-only runway ends would be excluded from these goals.

Circling vs. Straight-In Approaches
The System Benchmarks call for all instrument runways in the Commonwealth to be served by at least one straight-in approach. Circling approaches should serve as alternate approaches only.

Availability of Weather Reporting
On-field, 24 hour, 7 day per week, data-linked weather should be available for all instrument-capable airports in the System. This is typically an ASOS or AWOS-III base system; however, in the case of Community airports, an AWOS-A (pressure / altimeter only) is acceptable.

Access to ATC Clearance
Direct or remote transmitter receiver (RTR) communications are the preferred method of accessing flight clearances with Air Traffic Control. However, it is recognized that these can be a higher-cost system. For that reason, ground communication outlets (GCOs) are identified as acceptable at Regional (1 mile visibility) and Community airports.

Local Area Augmentation (LAAS)
LAAS is recommended at all Commercial Service, Reliever, General Aviation – Regional (1/2 mile visibility) and General Aviation – Regional (3/4 mile visibility) airports.

ADS-B Coverage
It is recommended that the DOAV augment ADS-B coverage, as needed, to provide coverage at 1000 AGL for Community service level airports and on ground coverage at all other instrument airports.

IMPACT OF IMPROVEMENTS

Two methods of evaluating the impact of recommended improvements were incorporated into the Study scope. The first is related to weather patterns and the second is related to socio-economic patterns.

WEATHER-RELATED DATA

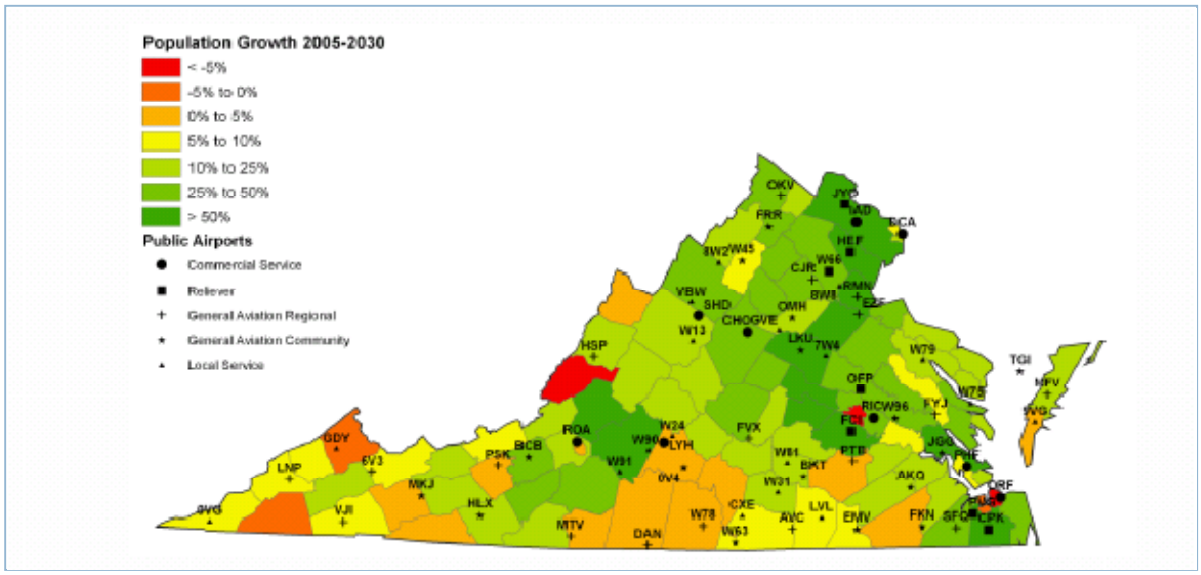
Any reduction in landing minimums will have a positive impact on the accessibility of an airport. However, the magnitude of the impact depends upon the weather patterns. For instance, if the weather is very rarely below a 400 foot ceiling, a reduction in landing minimums from 400 feet to 200 feet would have limited impact. However, if the weather is regularly below 400 feet, then the same improvement could dramatically affect the accessibility of the airport in a positive manner.

The Study Team pulled data from weather stations throughout the Commonwealth. Data related to wind, ceiling and visibility has been included in Appendix D.

SOCIO-ECONOMIC DATA

Similarly, the magnitude of impact can also depend upon the community served by the airport receiving the improvement. A brief review of socio-economic data was completed as part of the Study. The growth areas of the Commonwealth are noted in the figure below.

Figure 5-1 – Forecast Population Growth (2005 to 2030)



source: Virginia Tech analysis

CHAPTER 6 - RECOMMENDATIONS FOR INDIVIDUAL AIRPORT IMPROVEMENTS

Recommendations for improvements to the Commonwealth's air transportation system can be developed in two distinct ways: top-down and bottom-up. For this portion of the Study, the Consultant Team took a bottom-up, or individual airport, approach to recommendations.

The majority of this chapter consists of airport-specific reports that cover current conditions and the Study recommendations. The airport-specific reports can be used by individual airports to assist in the preparation of their development plans as well as by the Virginia Department of Aviation (DOAV) in setting overall development objectives.

REVIEW OF CURRENT CONDITIONS

Background Information
Included on the airport-specific tables is information including Virginia Air Transportation System Plan (VATSP) and NPIAS classifications, based aircraft counts, operational / enplanement figures, etc.

Existing and Planned Infrastructure
The Consultant Team reviewed airport layout drawings for each airport included in the Study. This review was used to determine design standards and development plans for each facility, focusing on those improvements which might impact or be impacted by instrument approach procedures. The review was also used to confirm the presence of required equipment such as lighting, signs and visual aids. This information is tabulated under "Proposed Development Plans" and "Runway Overview."

Existing Aeronautical Surveys
The Consultant Team reviewed existing aeronautical surveys to determine what, if any, survey information might be available to provide FAA Flight Procedures the information needed to design instrument approach procedures. The information was obtained from the NGS database as well as the FAA's Third Party Survey System.

Existing NAVAIDs and Instrument Approach Procedures
Included on the airport-specific tables is a summary of nearby navigational aids, including VORs, VORTACs and VOR/DMEs located within 30 nautical miles and NDB facilities located within 15 nautical miles.

Also tabulated are all current Instrument Approach Procedures (as of the 05 July 2007 publication date) and their associated landing minimums. For the purposes of consistency, ceiling and visibility minimums for Category B aircraft are presented in the summary table.

COMPARISON TO SYSTEM BENCHMARKS

As described in the previous chapter, benchmarks have been developed for each of the VATSP categories. The individual airport reports contain a summary of the airport's classification, the associated benchmarks and whether the airport's current facilities and approaches meet the established benchmarks. Recommendations have been developed for those areas where an airport's current facilities do not meet the established benchmarks.

RECOMMENDATIONS

Overall Recommendations

In many cases, the Consultant Team has developed overall recommendations for an airport. These recommendations are not specific to an individual approach procedure, but instead would improve multiple procedures and the facility itself. Overall recommendations fall into one of three categories: general, runway specific and runway end specific.

Examples of overall recommendations include weather reporting, approach lighting, runway lighting, communication improvements and obstruction removal.

Procedure-Specific Recommendations

When reviewing individual procedures, the Consultant Team looked at items such as clarity of the landing procedure, alignment of approach course, availability of methods to establish the final approach fix, descent gradient, length of final approach course, and clarity of the missed approach procedure. The Team also looked for ways to eliminate required special equipment.

IMPORTANT CONSIDERATIONS

The recommendations presented herein are intended to serve as an independent study prepared for the DOAV's review and consideration. These recommendations are not intended to take the place of individual airport master plans, environmental or capital improvement planning processes. The contents of this Study do not reflect the official views of the FAA or DOAV, nor are the FAA and DOAV endorsing the Study's recommended improvements and timelines for programming and funding. All improvements will be required to meet FAA Airport Improvement Program (AIP) eligibility requirements if Federal AIP funding is desired. All new development recommendations should be evaluated in accordance with FAA Order 7031.2C "Airway Planning Standard Number 1 – Terminal Air Navigation Facilities and Air Traffic Control Services and FAA Order 5100.38C "Airport Improvement Program Handbook" regarding FAA funding eligibility.

If an airport Sponsor would like to pursue improvements contained in this Study, they should work with their representatives at the FAA Airports District Office and the DOAV to develop a mutually acceptable development program.

Airport Design Standards
Under current FAA guidance, there are two primary areas where airport design and instrument approach procedures are related.

For new instrument approach procedures, Advisory Circular 150/5300-13, Appendix 16 provides an overview of required standards. These standards are categorized based on type of approach (precision, vertical guidance, nonprecision) and landing visibility minimum. The standards include elements such as protection surfaces, runway width, and runway marking/lighting.

Chapters Two and Three of the same advisory circular also provide detailed guidance about airport geometry and runway design. In many cases, the guidance is predicated by the lowest visibility minimum available to a specific runway end. For instance, runway protection zone (RPZ) dimensions and runway centerline separation criteria are impacted by visibility minimum. Runway design characteristics also vary depending upon visibility. These include obstacle free zones, object free areas, runway width, runway shoulders and runway safety areas.

Changes to airport facilities and instrument approach procedures must be carefully planned and coordinated. There are significant differences in design criteria and required standards when a runway moves from a nonprecision to precision approach. There are also significant changes when the landing visibility drops from 1 mile to ¾ statute miles.

New Navigational and Lighting Aids
All new navigational and lighting aids should be evaluated in accordance with FAA Order 7031.2C "Airway Planning Standard Number 1 – Terminal Air Navigation Facilities and Air Traffic Control Services, "FAA Publication FAA-APO-8310 "Establishment and Discontinuance Criteria for Precision Landing Systems" and FAA Order 5100.38C "Airport Improvement Program Handbook" regarding FAA funding eligibility.

New Procedure Process / Timeline
Many new instrument approach procedures are recommended as part of this process. For the development of new approaches, the FAA, DOAV and Sponsor must work hand-in-hand. While either the DOAV or the Sponsor can initiate the request for a new procedure, it is important to recognize that it is a multi-step process that involves obstruction surveys, airspace coordination and flight checks.

Currently, the Flight Procedures branch of the FAA is advising the aviation community to allow approximately 18 to 24 months from initiation to publication of new flight procedures.

Operational and Maintenance Costs
Beyond capital costs, the installation of lighting and navigational aids introduces operational costs. For navigational aids, there are also costs associated with scheduled maintenance. Table 6-1 represents, in 2009 dollars, the costs that can be anticipated annually.

Table 6-1 – Operational and Maintenance Costs

Equipment Description	Qty	Unit (watts)	Total (watts)	Total Load (watts)	Hours per Day	Power per Year (kWh)	Annual Cost of Operations*	Annual Cost of Maintenance
4000' Runway with MIRLs at 10%				**372**	**18**	**2,440**	**$220**	***as needed***
Edge Lights	40	4.5	180					
Threshold Lights	16	12	192					
5500' Runway with HIRLs at Step 1				**864**	**18**	**5,676**	**$511**	***as needed***
Edge Lights	56	12	672					
Threshold Lights	16	12	192					
8000' Runway with HIRLs, 15 hours at Step 1, 3 hours at Step 3				**5,014**	**18**	**32,942**	**$2,965**	***as needed***
Edge Lights	80	12/36	1280					
Threshold Lights	16	20/60	427					
Centerline	158	10/30	2107					
Touchdown Zone	180	5/15	1200					
REILs								
Pilot Controlled				**600**	**6**	**1,314**	**$118**	***as needed***
ATCT Controlled				**600**	**12**	**2,628**	**$237**	***as needed***
PAPI Systems**								
2-Box System				**1,100**	**24**	**9,636**	**$867**	***as needed***
4-Box System				**2,200**	**24**	**19,272**	**$1,734**	***as needed***
Approach Lighting								
MALSR				**20,000**	**12**	**87,600**	**$7,884**	***as needed***
ALSF-2				**150,000**	**12**	**657,000**	**$59,130**	***as needed***
Localizer				**3,000**	**24**	**26,280**	**$2,365**	**$8,000**
Glideslope				**3,000**	**24**	**26,280**	**$2,365**	**$8,000**
DME				**2,000**	**24**	**17,520**	**$1,577**	**$8,000**
NDB				**2,500**	**24**	**21,900**	**$1,971**	**$2,000**
Weather Stations								
AWOS / ASOS				**720**	**24**	**6,307**	**$568**	**$3,000**
Networking -Power				**1,000**	**24**	**8,760**	**$788**	***n/a***
Networking -Service				**1,000**	**24**	**8,760**	**$3,000**	**$3,000**

** assumes $0.09 per kWh*
*** load represents an average of day and night settings*
NOTE: Cost of maintenance for localizer, glideslope, DME and NDB represents estimated DOAV-incurred costs only for scheduled maintenance with an allowance for unscheduled maintenance.

PROPOSED NEW INSTRUMENT APPROACH PROCEDURES

The Study scope included preliminary evaluation of 22 new instrument approach procedures. These evaluations were completed at airports with unusually high landing minima, airports with runway ends without straight-in approaches and other airports where new procedures could significantly improve accessibility during adverse weather.

The following 22 procedures were considered for evaluation:

Table 6-2 – Proposed New Instrument Approach Procedures

Airport Name	Identifier	Proposed Procedure
Virginia Tech/Montgomery Executive	BCB	RNAV (GPS) RWY 30
no approach to RWY 30; eliminates circle-to-land requirement		
Charlottesville-Albemarle	CHO	LOC RWY 3
study improved stand alone LOC RWY 3; closer FAF (7.8nm); step-down fix; very high HAT; significant improvement to LOC only approach		
Charlottesville-Albemarle	CHO	LOC RWY 21
second ground-based approach to air carrier airport; in lieu of comparing to best approach, compared to "circle to land" for ground based approach to RWY 21		
Emporia-Greensville Regional	EMV	RNAV (GPS) RWY 15
no straight-in approach to RWY 15; eliminates circle-to-land requirement		
Leesburg Executive	JYO	RNAV (GPS) RWY 35
no straight-in approach to RWY 35; eliminates circle-to-land requirement		
Louisa County/Freeman Field	LKU	RNAV (GPS) RWY 9
no straight-in SIAP RWY 9; eliminates circle-to-land requirement		
Lynchburg Regional	LYH	LOC RWY 22
existing VOR/DME RWY 22 very high HAT of 802; add ALS for reduction of visibility		
Mountain Empire	MKJ	LOC/DME RWY 26
existing LOC RWY 26 requires ADF, step-down fix may lower HAT; eliminate "ADF Required" to establish FAF		
Accomack County	MFV	RNAV (GPS) RWY 21
no straight-in SIAP RWY 21; eliminates circle-to-land requirement		
Newport News/Williamsburg Int'l	PHF	LOC RWY 20
ground-based approach to crosswind, cancel NDB RWY 20 with HAT of 817; lower ground-based minimum by 440 feet		
Hampton Roads Executive	PVG	LOC RWY 10
only ground-based is NDB to crosswind RWY 2; improve ground-based minimum by 200 ft; eliminates ground-based circle-to-land requirement		
Hampton Roads Executive	PVG	RNAV (GPS) RWY 2
eliminate "or" GPS RWY 2; high HAT of 559; may cancel the NDB RWY 2 approach		
Orange County	OMH	RNAV (GPS) RWY 26
no straight-in approach to RWY 26; eliminates circle-to-land requirement		
Tazewell County	6V3	RNAV (GPS) RWY 7

Airport Name	Identifier	Proposed Procedure
no straight-in approach to RWY 7; eliminates circle-to-land requirement		
Hanover County Municipal	OFP	RNAV (GPS) RWY 34
no straight-in approach to RWY 34; eliminates circle-to-land requirement		
William M. Tuck	W78	RNAV (GPS) RWY 19
no straight-in approach to RWY 19; eliminates circle-to-land requirement		
Stafford Regional	RMN	RNAV (GPS) RWY 15
no straight-in approach to RWY 15; eliminates circle-to-land requirement		
Suffolk Executive	SFQ	RNAV (GPS) RWY 22
no straight-in approach to RWY 22; eliminates circle-to-land requirement		
Tappahannock-Essex County	XSA	LOC RWY 28
no ground-based SIAP available; provides ground-based approach		
Middle Peninsula Regional	FYJ	LOC RWY 27
no straight-in approach or straight-in ground-based approach to airport; eliminates circle-to-land requirement and provides ground-based approach		
Luray Caverns	W45	LOC RWY 4 or RNAV (GPS) RWY 4 - LP
eliminates circle-to-land requirement; also strong candidate for LPV or LP		
Luray Caverns	W45	LOC RWY 22 or RNAV (GPS) RWY 22 - LP
candidate for LPV or LP		

source: Consultant Recommendation

The proposed new instrument approach procedures were evaluated and are tabulated below. The best existing landing ceiling to the selected runway end is shown. Additionally, the anticipated new landing ceiling is shown (see note above for exception at Charlottesville-Albemarle Airport). On average, a 194 foot reduction in landing ceiling minimums can be achieved with the development of the proposed procedures.

Table 6-3 – Proposed New Instrument Approach Procedures with Associated Improvements to Minima

Airport Name	ID	Proposed Procedure	Best Existing Minimum (ceiling in ft)	Anticipated Minimum (ceiling in ft)	Improvement in Minimum (ft)
Virginia Tech/Montgomery Executive	BCB	RNAV (GPS) RWY 30	2800	2760	-40
Charlottesville-Albemarle	CHO	LOC RWY 3	1380	1060	-320
Charlottesville-Albemarle	CHO	LOC RWY 21	1380	980	-400
Emporia-Greensville Regional	EMV	RNAV (GPS) RWY 15	580	520	-60
Leesburg Executive	JYO	RNAV (GPS) RWY 35	900	820	-80
Louisa County/Freeman Field	LKU	RNAV (GPS) RWY 9	1120	880	-240
Lynchburg Regional	LYH	LOC RWY 22	1620	1300	-320
Mountain Empire	MKJ	LOC/DME RWY 26	3080	3080	0

Airport Name	ID	Proposed Procedure	Best Existing Minimum (ceiling in ft)	Anticipated Minimum (ceiling in ft)	Improvement in Minimum (ft)
Accomack County	MFV	RNAV (GPS) RWY 21	560	420	-140
Newport News/Williamsburg Int'l	PHF	LOC RWY 20	440	420	-20
Hampton Roads Executive	PVG	LOC RWY 10	400	380	-20
Hampton Roads Executive	PVG	RNAV (GPS) RWY 2	580	380	-200
Orange County	OMH	RNAV (GPS) RWY 26	1360	880	-480
Tazewell County	6V3	RNAV (GPS) RWY 7	3220	3120	-100
Hanover County Municipal	OFP	RNAV (GPS) RWY 34	680	520	-160
William M. Tuck	W78	RNAV (GPS) RWY 19	960	820	-140
Stafford Regional	RMN	RNAV (GPS) RWY 15	740	720	-20
Suffolk Executive	SFQ	RNAV (GPS) RWY 22	540	420	-120
Tappahannock-Essex County	XSA	LOC RWY 28	600	500	-100
Middle Peninsula Regional	FYJ	LOC RWY 27	580	480	-100
Luray Caverns	W45	LOC RWY 4 or RNAV (GPS) RWY 4 - LP	2320	1300	-1020
Luray Caverns	W45	LOC RWY 22 or RNAV (GPS) RWY 22 - LP	2260	1280	-980

source: Consultant Recommendation

INDIVIDUAL AIRPORT IMPROVEMENTS

As detailed throughout this chapter (Chapter 6), a variety of airport-specific improvements are recommended. While these improvements have been formatted into airport-specific subchapters, it is important to consider these recommendations in context with the System Benchmarks. For convenience, the two key tables have been repeated below.

Table 6-4 – System Benchmarks: Instrument Approach Types and Minima

	Best Approach (primary runway end)		Secondary Approach (different runway end)		ALL Ends of Instrument Runways***	
	Type	**Minimums**	**Type**	**Minimums**	**Type**	**Minimums**
Commercial Service (>= 1 million enplanements)	ILS CAT III	100 – 1200	ILS CAT I	200 – 1800	Ground-based	400 – 1
	LPV and LAAS	200 – 1800	LPV and LAAS	200 – 1800	LPV and LAAS	400 – 1
Commercial Service (<1 million, >= 200,000 enplanements)	ILS CAT I	200 – 1800	ILS CAT I	200 – 2400*	Ground-based	400 – 1
	LPV and LAAS	200 – 1800	LPV and LAAS	200 – 2400*	LPV and LAAS	400 – 1
Commercial Service (< 200,000 enplanements)	ILS CAT I	200 – 2400*	Ground-based	400 – 3/4		
	LPV and LAAS	200 – 2400*	LPV and LAAS	250 – 3/4	LPV and LAAS	400 – 1
Reliever	ILS CAT I	200 – 1/2	Ground-based	400 – 3/4		
	LPV and LAAS	200 – 1/2	LPV and LAAS	250 – 3/4	LNAV	400 – 1
Regional (1/2 mile visibility)	ILS CAT I	200 – 1/2	Ground-based	400 – 1		
	LPV and LAAS	200 – 1/2	LPV and LAAS	250 – 1	LNAV	400 – 1
Regional (3/4 mile visibility)	Ground-based	400 – 3/4	Ground-based	400 – 1		
	LPV and LAAS	250 – 3/4	LPV and LAAS	250 – 1	LNAV	400 – 1
Regional (1 mile visibility)**	Ground-based	400 – 1				
	LPV	250 – 1	LNAV	400-1	LNAV	400 – 1
Community**	Ground-based	500 – 1				
	LNAV	400 – 1	LNAV	500 - 1		
Local	case-by-case					

source: Consultant Recommendation

**1800 RVR for aircraft equipped with approved flight director, HUD or coupled autopilot systems.*

*** For Regional (1 mile visibility) and Community airports, the best ground-based approach may not be on the same runway end as the best GPS approach.*

****Instrument runways must be paved and in a condition appropriate to support instrument operations.*

Table 6-5 – Instrumentation Required to Meet System Benchmarks

	Best Approach (primary runway end)	Secondary Approach (different runway end)	ALL Other Ends of Instrument Runways
Commercial Service (>= 1 million enplanements)	ALSF-2, TDZ, CL, HIRLs, RVR, PAPI	ALSF-2 or MALSR, TDZ, CL, HIRLs, RVR, PAPI	REILs, HIRLs, PAPI
Commercial Service (<1 million, >= 200,000 enplanements)	ALSF-2 or MALSR, TDZ, CL, HIRLs, RVR, PAPI	ALSF-2 or MALSR, TDZ, CL, HIRLs, RVR, PAPI	REILs, HIRLs, PAPI
Commercial Service (< 200,000 enplanements)	MALSR, HIRLs, RVR, PAPI	MALS, HIRLs, PAPI	PAPIs, MIRLs, REILs
Reliever	MALSR, HIRLs, PAPI	MALS, HIRLs, PAPI	REILs, MIRLs, PAPI
Regional (1/2 mile visibility)	MALSR, HIRLs, PAPI	REILs, HIRLs, PAPI	REILs, MIRLs, PAPI
Regional (3/4 mile visibility)	MALS, HIRLs, PAPI	REILs, HIRLs, PAPI	REILs, MIRLs, PAPI
Regional (1 mile visibility)	REILs (or approach lights), MIRLs, PAPI	REILs, MIRLs, PAPI	REILs, MIRLs, PAPI
Community	REILs, MIRLs, PAPI	REILs, MIRLs, PAPI	REILs, MIRLs, PAPI

source: Consultant Recommendation

Accomack County (MFV)

Melfa, Virginia

AIRPORT INFORMATION	
ROLE / CLASSIFICATION INFORMATION	
VATSP Classfication (2008):	General Aviation Regional
NPIAS Role (2008):	General Aviation
Study Classification:	General Aviation Regional (3/4 mile visibility)

ACTIVITY INFORMATION	
Based Aircraft (2007):	24
Annual Operations (2020):	20194
Annual Enplanements (2020):	n/a
DEVELOPMENT INFORMATION (2008)	
Critical Airport Reference Code (Existing):	B-II
Critical Airport Reference Code (Proposed):	C-II
Airport Layout Plan (Original):	December, 2003
Airport Layout Plan (Revision):	n/a

Proposed Development (from ALD):

- Upgrade to C-II
- Construct parallel taxiway
- Upgrade RWY 3 RPZ: 3/4 sm visibility
- Install ODALS (RWY 3)
- Update RWY 21 RPZ

AERONAUTICAL SURVEY INFORMATION

Runway End	Survey Type	Survey Date
all	Photoslope	2001
all	OC-MFV 5598	1996
21	SUPLC	1996
3	C	1996
21	ANA-LPV	2006
3	ANA-LPV	2006

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS	
Available Weather Reporting:	AWOS-III (PT)
Common Traffic Advisory Frequency:	122.8
Clearance Delivery:	GCO

Nearby Navigational Aids:

SNOW HILL	VORTAC	112.4	SWL	218°/ 28.3 NM TO FIELD
CAPE CHARLES	VORTAC	112.2	CCV	042°/ 21.2 NM TO FIELD
ACCOMACK	NDB	336	BDB	032°/ 4.9 NM TO FIELD

Instrument Approach Procedure Summary

Minimums listed are Category B

EXISTING PROCEDURES		
RUNWAY 3		
LOC RWY 3	400 - 1 (353)	Orig
RNAV (GPS) RWY 3 - LNAV	440 - 1 (393)	Orig
VOR/DME RWY 3	440 - 1 (393)	Amdt 1

PROCEDURES PROPOSED AS PART OF STUDY
RNAV (GPS) RWY 21 - LNAV
RNAV (GPS) RWY 21 - LPV
RNAV (GPS) RWY 3 - LPV

VISIBILITY CHANGES PROPOSED AS PART OF STUDY	
RUNWAY 3:	1 SM to 3/4 SM

REVIEWER COMMENTS

It is strongly recommended that the circle-to-land requirement be eliminated for Runway 21 landings. A preliminary evaluation of the RNAV (GPS) RWY 21 - LNAV approach was completed. The approach may support minimums as low as 420-1 (373). This is a 140 foot reduction. The Study anticipates that significant easement acquisition is required -- more than is shown on the Airport Layout Drawing. The ALD shows approximately 18 acres, but it is anticipated that at least 60 additional acres will be required to remove taller vegetation. The ALD shows proposed MIRLs and ODALS. Instead, the Study recommends HIRLS and MALS. The Study recommends Runway 3 markings be upgraded to precision standards (non-precision markings are currently shown on the ALD.) The Study recommends a reduction in visibility minimums from 1 mile to 3/4 mile. Additional information regarding the estimated impacts and costs associated with the visibility changes is included in Appendix E.

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 3 21 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	B-II	C-II
Runway Dimensions (Length x Width in ft):	5000 x 100	5000 x 100
Runway to Taxiway Separation (feet):	none	300
Runway Lighting:	MIRL	MIRL
RUNWAY 3		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 700 x 1000	1000 x 1510 x 1700
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	PAPI; REILs	PAPI; ODALS
RUNWAY 21		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 700 x 1000	500 x 1010 x 1700
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	PAPI; REILs	PAPI; REILs

Accomack County (MFV)

Melfa, Virginia

System Benchmarks

General Aviation Regional (3/4 mile visibility)			
Best Approach (Primary Runway End)			
BENCHMARK		**RUNWAY 3**	
Approach:	Ground-based	☑ meets	LOC RWY 3
Ceiling:	400 AGL	☑ meets	
Visibility:	3/4 statute mile	☐ meets	
Approach:	LPV	☐ meets	RNAV (GPS) RWY 3 - LNAV
Ceiling:	250 AGL	☐ meets	
Visibility:	3/4 statute mile	☐ meets	
Equipment:	MALS, HIRLs, PAPI	☐ meets	existing 2-box PAPI
Secondary Approach (Different Runway End)			
BENCHMARK		**RUNWAY 21**	
Approach:	Ground-based	☐ meets	n/a (no ground-based approach available)
Ceiling:	400 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Approach:	LPV	☐ meets	n/a (no satellite-based approach available)
Ceiling:	250 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Equipment:	REILs, HIRLs, PAPI	☐ meets	existing 2-box PAPI

Additional Requirements			
Weather:	on-field, 24/7, data-linked	☑ meets	
Access to ATC Clearance:	RTR	☐ meets	
ADS-B Coverage:	On ground	☐ meets	

Overall Recommendations

GENERAL		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Radar Coverage Request commissioning of Wallops ASR Radar.	Improved service.	Unknown
Weather Reporting Upgrade existing AWOS-III to include freezing rain sensor.	Improves information available to pilot.	$50,000
Communications Upgrade existing Ground Communication Outlet (GCO) to a Remote Transmitter / Receiver (RTR) directly with Norfolk Approach.	Improves clearance delivery process. Provides direct communication with approach control. Used by aircraft on ground for obtaining or canceling IFR clearances.	$40,000
Communications Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	Improves pilot/controller communications and clearance delivery process.	Less than $5,000
Data link Provide ADS-B coverage while on the ground.	Provides traffic surveillance, terrain avoidance, weather data, etc. Crucial component for Next Generation Air Transportation System.	$100,000
Local Area Augmentation System (LAAS) Provide LAAS coverage to augment existing global positioning system.	Provides enhanced signal accuracy.	Unknown

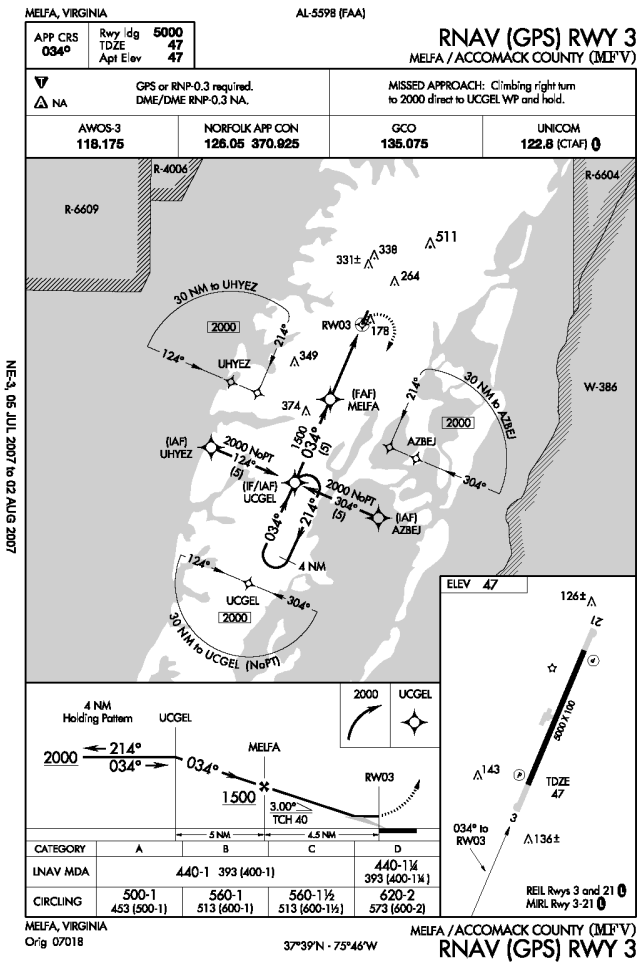
RUNWAY 3 21		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Runway Lighting Replace Medium Intensity Runway Lights (MIRLs) with High Intensity Runway Lights (HIRLs).	Improves pilot's ability to detect the runway environment.	$300,000

Overall Recommendations

RUNWAY 3		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions (tree).	Standards.	Varies
Approach Lighting System Install MALS for Runway 3.	Improves pilot's ability to detect the landing environment.	$450,000
Visibility Minimum Upon installation of approach lighting system and subsequent acceptance of visibility credit, different design standards apply (less than 1 mile).	Lower landing visibility minimum. Requires completion of parallel taxiway, removal of existing trees currently penetrating FAR Part 77 surfaces.	$1,000,000
Precision Approach Path Indicator Upgrade Runway 3 PAPI from a 2 box to a 4 box unit.	Provides improved visual vertical descent guidance information during the approach to the runway.	$20,000
New Procedure Request development of RNAV (GPS) RWY 3 Approach with LPV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost

RUNWAY 21		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions (trees).	Standards.	Varies
Precision Approach Path Indicator Upgrade Runway 21 PAPI from a 2 box to a 4 box unit.	Provides improved visual vertical descent guidance information during the approach to the runway.	$20,000
New Procedure Request development of RNAV (GPS) RWY 21 Approach with LPV and LNAV landing minimums.	Improve all-weather capability of the runway and airport and eliminate requirement for circle-to-land operations. The LNAV approach may support minimums as low as 420-1 (373) with a reduction in HAA of 140 feet.	No equipment cost

Procedure Overview



RNAV (GPS) RWY 3 - LNAV

FAA PROCEDURE DATA		
Critical Obstacle:	178	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	12	
Minimum Descent Altitude / Decision Height:	440	

Note 1: Tank (KMFV0017)

Note 2:

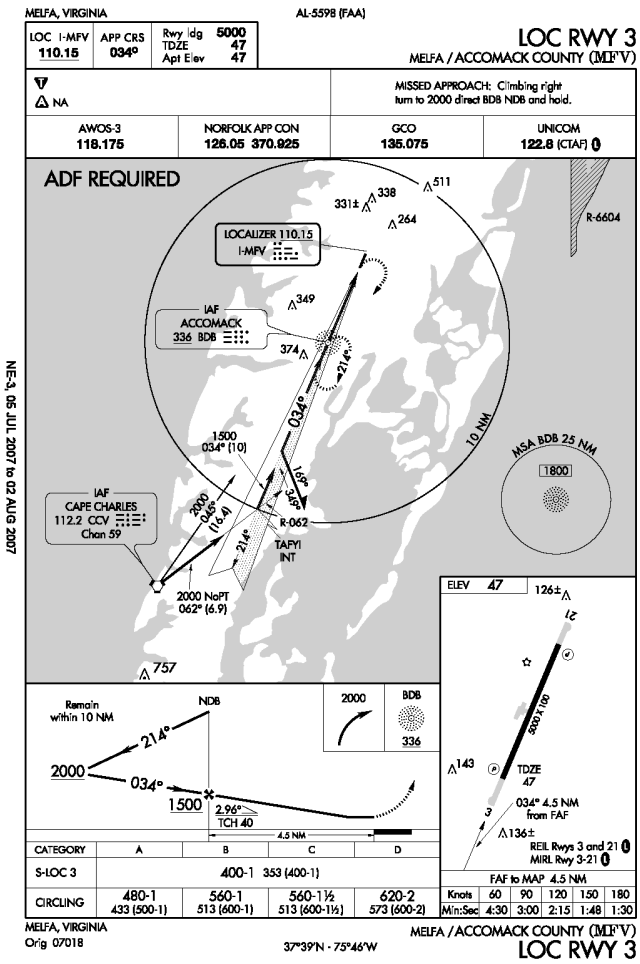
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	Yes
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Overview



LOC RWY 3

FAA PROCEDURE DATA		
Critical Obstacle:	136	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	14	
Minimum Descent Altitude / Decision Height:	400	

Note 1: Tree

Note 2:

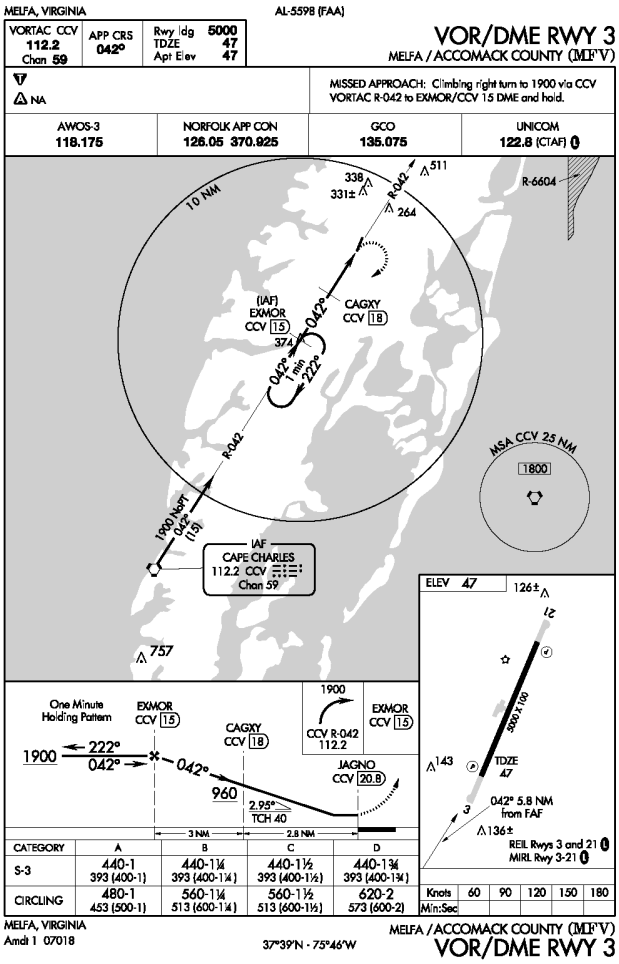
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	Yes
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Overview



VOR/DME RWY 3

FAA PROCEDURE DATA		
Critical Obstacle:	143	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:	50	
Other Adjustment:		**see note 2**
Rounding Adjustment:	-3	
Minimum Descent Altitude / Decision Height:	440	

Note 1: TWY (47-0868)

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM REQUIRED	KNOWN DEFICIENCIES
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	Yes
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Recommendations

RNAV (GPS) RWY 3		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Approach Lighting System Install MALS for Runway 3. See Overall Recommendations.	Improves pilot's ability to detect the landing environment.	$450,000 (duplicate)
Visibility Minimum Upon installation of approach lighting system, request procedure be updated to 3/4 statute mile visibility.	Lower landing visibility minimum.	See Overall Recommendations

Procedure Recommendations

LOC RWY 3		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Procedure Review Request procedure be modified to eliminate ADF requirement.	Procedure simplification and improved reliability.	No equipment cost
Approach Lighting System Install MALS for Runway 3. See Overall Recommendations.	Improves pilot's ability to detect the landing environment.	$450,000 (duplicate)
Visibility Minimum Upon installation of approach lighting system, request procedure be updated to 3/4 statute mile visibility.	Lower landing visibility minimum.	See Overall Recommendations
Distance Measuring Equipment Install Distance Measuring Equipment (DME). Co-locate with the localizer.	Improves pilot's situational awareness. Preferred method to establish the final approach fix.	$100,000
Facility Replacement Replace problematic localizer.	Improves reliability.	$100,000

Procedure Recommendations

VOR / DME RWY 3		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Critical Obstacle Field verify critical obstacle to change accuracy code from "D" to "A" or 50 feet to 3 feet.	Minimum Descent Altitude (MDA) may be reduced by 40 to 60 feet.	Less than $10,000
Approach Lighting System Install MALS for Runway 3. See Overall Recommendations.	Improves pilot's ability to detect the landing environment.	$450,000 (duplicate)
Visibility Minimum Upon installation of approach lighting system, request procedure be updated to 3/4 statute mile visibility.	Lower landing visibility minimum.	See Overall Recommendations

Allen C. Perkinson/BAAF (BKT)

Blackstone, Virginia

AIRPORT INFORMATION	
ROLE / CLASSIFICATION INFORMATION	
VATSP Classfication (2008):	General Aviation Community
NPIAS Role (2008):	n/a
Study Classification:	General Aviation Community

ACTIVITY INFORMATION	
Based Aircraft (2007):	11
Annual Operations (2020):	4531
Annual Enplanements (2020):	n/a
DEVELOPMENT INFORMATION (2008)	
Critical Airport Reference Code (Existing):	C-II
Critical Airport Reference Code (Proposed):	C-II
Airport Layout Plan (Original):	September, 2001
Airport Layout Plan (Revision):	n/a

Proposed Development (from ALD):

- Install LOC (RWY 22)
- Recapture RWY 22 700' displacement
- Parallel taxiway RWY 4-22 & 1-19
- Upgrade RWY 4 RPZ: 3/4 sm visibility
- Upgrade RWY 22 RPZ: 3/4 sm visibility

AERONAUTICAL SURVEY INFORMATION

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS	
Available Weather Reporting:	None
Common Traffic Advisory Frequency:	122.95
Clearance Delivery:	Phone

Nearby Navigational Aids:

LAWRENCEVILLE	VORTAC	112.9	LVL	359°/ 15.5 NM TO FIELD
FLAT ROCK	VORTAC	113.3	FAK	198°/ 27.9 NM TO FIELD
BLACKSTONE	NDB	326	BKT	135°/ 5.4 NM TO FIELD

Allen C. Perkinson/BAAF (BKT)

Blackstone, Virginia

Instrument Approach Procedure Summary

Minimums listed are Category B

EXISTING PROCEDURES		
CIRCLING		
NDB OR GPS-A	1100 - 2 1/4 (661)	Amdt 11
RUNWAY 22		
RNAV (GPS) RWY 22 - LNAV	980 - 1 (542)	Orig
RUNWAY 4		
RNAV (GPS) RWY 4 - LNAV	940 - 1 (511)	Orig

PROCEDURES PROPOSED AS PART OF STUDY
RNAV (GPS) RWY 4 - LPV
VOR/DME-B

VISIBILITY CHANGES PROPOSED AS PART OF STUDY	
none	

REVIEWER COMMENTS

Development of the VOR/DME - B approach towards the Lawrenceville VORTAC (LVL) would permit cancellation of the NDB-A approach while still maintaining one ground based approach to the Airport. Verify and update the facility directory and approach plate diagrams to show existing runway lengths and displaced landing thresholds. Runway 1-19 is recommended to be closed due to the pavement condition and use restrictions. The airport layout drawing shows items which go beyond Study recommendations. Items include runway edge lighting, RPZ, LOC and 3/4 sm visibility minimums.

SPONSOR COMMENTS

Sponsor notes that facility directory has been updated to properly show the Runway 22 threshold. Sponsor notes that closure of Runway 1-19 is not viewed favorably. Sponsor notes concern with installation of PAPIs and REILs due to special night-vision goggle operations. Sponsor notes that ATC services commenced in April, 2008.

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 1 19 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	B-II (small)	B-II (small)
Runway Dimensions (Length x Width in ft):	4031 x 75	4031 x 75
Runway to Taxiway Separation (feet):	none	none
Runway Lighting:	MIRL	MIRL
RUNWAY 1		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	250 x 450 x 1000	250 x 450 x 1000
Runway Markings:	Visual	Visual
Available Visual Approach Aids:	none	PAPI
RUNWAY 19		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	250 x 450 x 1000	250 x 450 x 1000
Runway Markings:	Visual	Visual
Available Visual Approach Aids:	none	PAPI
RUNWAY 4 22 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	C-II	C-II
Runway Dimensions (Length x Width in ft):	5332 x 150	5332 x 150
Runway to Taxiway Separation (feet):	none	400
Runway Lighting:	MIRL	HIRL
RUNWAY 4		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 1010 x 1700	1000 x 1510 x 1700
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	none	PAPI
RUNWAY 22		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 1010 x 1700	1000 x 1510 x 1700
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	none	PAPI; REILs

Allen C. Perkinson/BAAF (BKT)

Blackstone, Virginia

System Benchmarks

General Aviation Community			
Best Approach (Primary Runway End)			
BENCHMARK		**RUNWAY 4**	
Approach:	Ground-based	☐ meets	n/a (no ground-based approach available)
Ceiling:	500 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Approach:	LNAV	☑ meets	RNAV (GPS) RWY 4 - LNAV
Ceiling:	400 AGL	☐ meets	
Visibility:	1 statute mile	☑ meets	
Equipment:	REILs, MIRLs, PAPI	☐ meets	existing MIRLs
Secondary Approach (Different Runway End)			
BENCHMARK		**RUNWAY 22**	
Approach:		☐ meets	n/a (no ground-based approach available)
Ceiling:		☐ meets	
Visibility:		☐ meets	
Approach:	LNAV	☑ meets	RNAV (GPS) RWY 22 - LNAV
Ceiling:	500 AGL	☐ meets	
Visibility:	1 statute mile	☑ meets	
Equipment:	REILs, MIRLs, PAPI	☐ meets	existing MIRLs

Additional Requirements			
Weather:	Normally on-field, 24/7, data-linked	☐ meets	
Access to ATC Clearance:	RTR or GCO	☐ meets	
ADS-B Coverage:	1000 AGL	☐ meets	

Overall Recommendations

GENERAL		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Altimeter Source Install AWOS-A.	Provides local altimeter source.	$25,000
Communications Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	Improves pilot/controller communications and clearance delivery process.	Less than $5,000
Communications Install a Ground Communication Outlet (GCO) directly with Washington Center.	Provides direct communication with approach control via radio and an "on-demand" telephone land line link. Used by aircraft on ground for obtaining or canceling IFR clearances.	$20,000
Data link Provide ADS-B coverage at 1000 AGL or lower.	Provides traffic surveillance, terrain avoidance, weather data, etc. Crucial component for Next Generation Air Transportation System.	Unknown
Runway Closure Close Runway 1-19.	Due to existing condition and use restrictions.	No equipment cost

RUNWAY 4 22		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Airfield Lighting Control Change control sequence and/or facility directory note for MIRLs to be preset on low intensity with higher intensity activated on CTAF.	Provides visibilty of landing environment during night and adverse weather conditions even during times of aircraft equipment failure or pilot control system malfunction.	Less than $10,000
Procedure Review Verify and update the facility directory and approach plate diagrams to show existing runway lengths and displaced landing thresholds.	Clarity.	No equipment cost
New Procedure Request development of VOR/DME - B approach.	Provides an alternate ground-based approach.	No equipment cost

Overall Recommendations

RUNWAY 4		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions (tree).	Standards.	Varies
Runway End Identifier Lights Install REILs for Runway 4.	Improves pilot's ability to detect the landing environment.	$50,000
Precision Approach Path Indicator Install 4-box PAPI for Runway 4.	Provides visual vertical descent guidance information during the approach to the runway.	$70,000
Aeronautical Survey Request / complete aeronautical survey to enable development of LPV approach to Runway 4.	Provides survey data for instrument approach procedures.	$50,000
New Procedure Request development of RNAV (GPS) RWY 4 Approach with LPV landing minimums.	Improve all-weather capability of the runway and airport. LPV approach provides vertical guidance.	No equipment cost

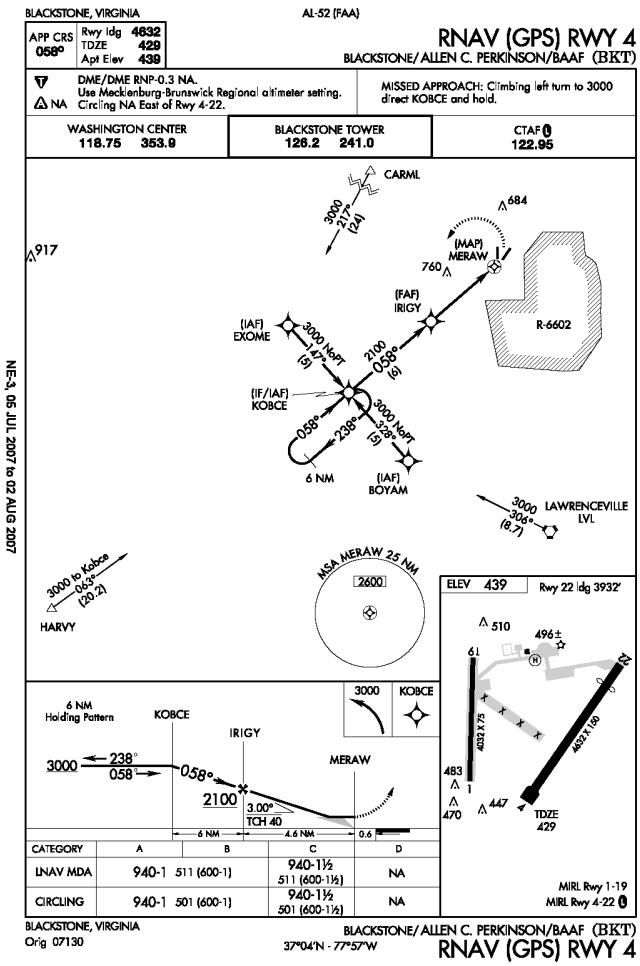
Overall Recommendations

RUNWAY 22		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions (tree).	Standards.	Varies
Landing Threshold Eliminate / reduce threshold displacement. Existing 700' displacement may be able to be reduced while maintainig 600' underrun safety area (road).	Maximize runway length.	$2,000,000
Runway End Identifier Lights Install REILs for Runway 22.	Improves pilot's ability to detect the landing environment.	$50,000
Precision Approach Path Indicator Install 4-box PAPI for Runway 22.	Provides visual vertical descent guidance information during the approach to the runway.	$70,000

Allen C. Perkinson/BAAF (BKT)

Blackstone, Virginia

Procedure Overview



RNAV (GPS) RWY 4 - LNAV

FAA PROCEDURE DATA		
Critical Obstacle:	760	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:	55	
Accuracy Code Adjustment:	50	
Other Adjustment:	-181	**see note 2**
Rounding Adjustment:	6	
Minimum Descent Altitude / Decision Height:	940	

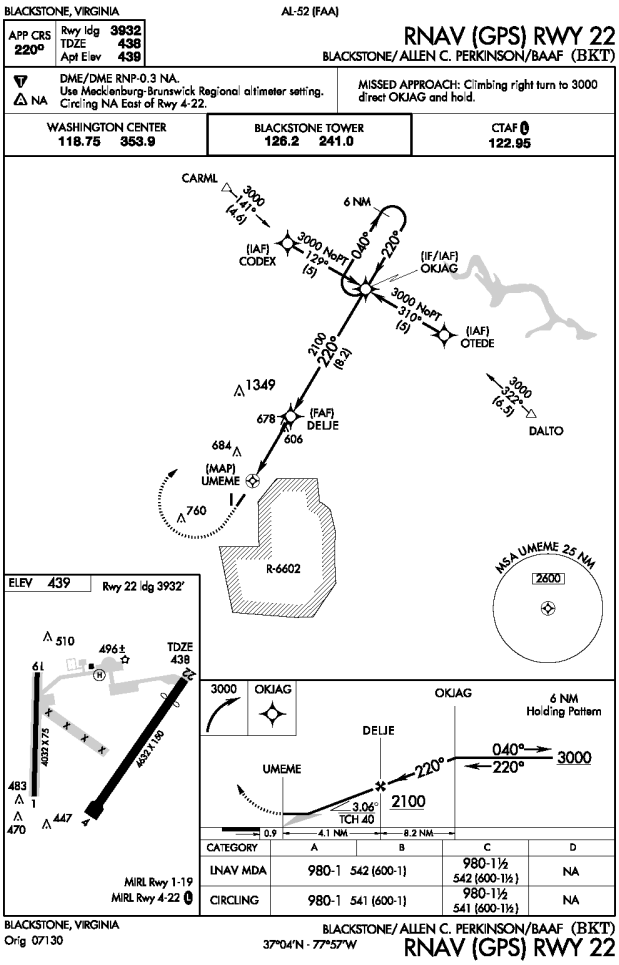
Note 1: Tower

Note 2: secondary area adjustment

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	1 SM	**KNOWN DEFICIENCIES**
	REQUIRED	
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	Yes
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	Update Recommended

Procedure Overview



RNAV (GPS) RWY 22 - LNAV

FAA PROCEDURE DATA		
Critical Obstacle:	606	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:	55	
Accuracy Code Adjustment:	50	
Other Adjustment:		**see note 2**
Rounding Adjustment:	19	
Minimum Descent Altitude / Decision Height:	980	

Note 1: Tower

Note 2:

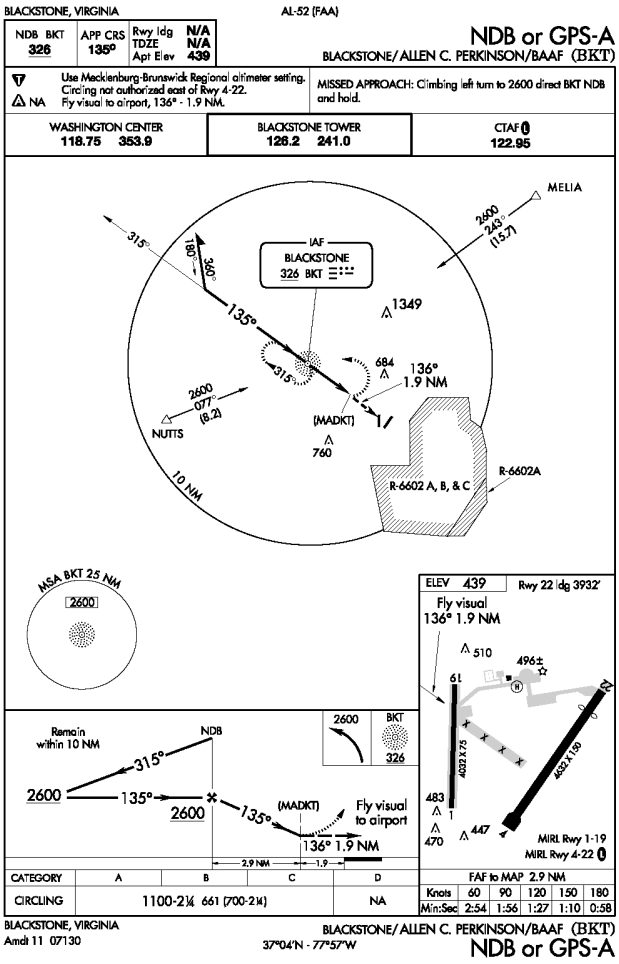
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	1 SM	**KNOWN DEFICIENCIES**
	REQUIRED	
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	Yes
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Allen C. Perkinson/BAAF (BKT)

Blackstone, Virginia

Procedure Overview



NDB OR GPS-A

FAA PROCEDURE DATA		
Critical Obstacle:	681	**see note 1**
Required Obstacle Clearance:	300	
Remote Altimeter Adjustment:	55	
Accuracy Code Adjustment:	50	
Other Adjustment:		**see note 2**
Rounding Adjustment:	14	
Minimum Descent Altitude / Decision Height:	1100	

Note 1: Tower

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	CIRCLING	KNOWN DEFICIENCIES
	REQUIRED	
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Recommended	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Visual (Basic)	None
Holding Position Signs and Markings	Visual (Basic)	None
Runway Edge Lights	MIRL / LIRL (for night minima only)	None
Parallel Taxiway	Recommended	Yes
Approach Lights	Not Required	None
Runway Design Standards	Not Required	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-2, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Recommendations

RNAV (GPS) RWY 4		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Critical Obstacle Field verify critical obstacle to change accuracy code from "D" to "A" or 50 feet to 3 feet.	Minimum Descent Altitude (MDA) may be reduced by 40 to 60 feet.	Less than $10,000
Altimeter Source Install AWOS-A and request FAA re-evaluation of remote altimeter setting source penalty. See Overall Recommendations.	Minimum Descent Altitude (MDA) may be reduced by 40 to 60 feet by eliminating the remote altimeter setting source (RASS) adjustment.	$25,000 (duplicate)
Procedure Review (Approach Category) Request addition of Approach Category D minimums to the procedure.	Improves accessibility of the airport.	No equipment cost
Procedure Review Request procedure be updated to delete "MIRL RWY 1-19" note.	Procedure clarity.	No equipment cost

Procedure Recommendations

RNAV (GPS) RWY 22		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Critical Obstacle Field verify critical obstacle to change accuracy code from "D" to "A" or 50 feet to 3 feet.	Minimum Descent Altitude (MDA) may be reduced by 40 to 60 feet.	Less than $10,000
Altimeter Source Install AWOS-A and request FAA re-evaluation of remote altimeter setting source penalty. See Overall Recommendations.	Minimum Descent Altitude (MDA) may be reduced by 40 to 60 feet by eliminating the remote altimeter setting source (RASS) adjustment.	$25,000 (duplicate)
Procedure Review (Approach Category) Request addition of Approach Category D minimums to the procedure.	Improves accessibility of the airport.	No equipment cost

NDB OR GPS A		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Critical Obstacle Field verify critical obstacle to change accuracy code from "D" to "A" or 50 feet to 3 feet.	Minimum Descent Altitude (MDA) may be reduced by 40 to 60 feet.	Less than $10,000
Altimeter Source Install AWOS-A and request FAA re-evaluation of remote altimeter setting source penalty. See Overall Recommendations.	Minimum Descent Altitude (MDA) may be reduced by 40 to 60 feet by eliminating the remote altimeter setting source (RASS) adjustment.	$25,000 (duplicate)

Blue Ridge (MTV)

Martinsville, Virginia

AIRPORT INFORMATION	
ROLE / CLASSIFICATION INFORMATION	
VATSP Classfication (2008):	General Aviation Regional
NPIAS Role (2008):	General Aviation
Study Classification:	General Aviation Regional (3/4 mile visibility)

ACTIVITY INFORMATION	
Based Aircraft (2007):	60
Annual Operations (2020):	25392
Annual Enplanements (2020):	n/a

DEVELOPMENT INFORMATION (2008)	
Critical Airport Reference Code (Existing):	C-II
Critical Airport Reference Code (Proposed):	C-II
Airport Layout Plan (Original):	December, 2005
Airport Layout Plan (Revision):	n/a

Proposed Development (from ALD):
- Extend RWY 12 (500' / 1000')
- Install ILS (RWY 30)
- Install MALSR (RWY 30)

AERONAUTICAL SURVEY INFORMATION

Runway End	Survey Type	Survey Date
all	Photoslope	2000
30	ANAPC	2001
12	ANA-LPV	underway

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS	
Available Weather Reporting:	AWOS-III (P)
Common Traffic Advisory Frequency:	122.7
Clearance Delivery:	RTR

Nearby Navigational Aids:

BALES	NDB	396	UV	304°/ 5.5 NM TO FIELD

Blue Ridge (MTV)

Martinsville, Virginia

Instrument Approach Procedure Summary

Minimums listed are Category B

EXISTING PROCEDURES		
RUNWAY 12		
RNAV (GPS) RWY 12 - LNAV	1420 - 1 (479)	Orig
RUNWAY 30		
LOC RWY 30	1340 - 1 (415)	Orig
RNAV (GPS) RWY 30 - LNAV	1620 - 3/4 (695)	Amdt 1
RNAV (GPS) RWY 30 - LPV	1175 - 1 (250)	Amdt 1

PROCEDURES PROPOSED AS PART OF STUDY
RNAV (GPS) RWY 12 - LPV

VISIBILITY CHANGES PROPOSED AS PART OF STUDY	
none	

REVIEWER COMMENTS

Consideration may be given to upgrading MTV's study role to General Aviation Regional (1/2 mile visibility) with the installation of a full ILS. The Airport currently has visibility minimums as low as 3/4 sm. The Airport Sponsor completed the requested informational survey.

SPONSOR COMMENTS

Sponsor notes that the Authority remains committed to a full ILS approach to Runway 30.

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 12 30 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	C-II	C-II
Runway Dimensions (Length x Width in ft):	5002 x 100	5500/6000 x 100
Runway to Taxiway Separation (feet):	300	300
Runway Lighting:	MIRL	HIRL
RUNWAY 12		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 1010 x 1700	500 x 1010 x 1700
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	PAPI; REILs	PAPI; REILs
RUNWAY 30		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 700 x 1000	1000 x 1510 x 1700
Runway Markings:	Non-Precision	Precision
Available Visual Approach Aids:	PAPI; ODALS	PAPI; MALSR

Blue Ridge (MTV)

Martinsville, Virginia

System Benchmarks

General Aviation Regional (3/4 mile visibility)			
Best Approach (Primary Runway End)			
BENCHMARK		**RUNWAY 30**	
Approach:	Ground-based	☑ meets	LOC RWY 30
Ceiling:	400 AGL	☐ meets	
Visibility:	3/4 statute mile	☐ meets	
Approach:	LPV	☑ meets	RNAV (GPS) RWY 30 - LPV
Ceiling:	250 AGL	☑ meets	
Visibility:	3/4 statute mile	☐ meets	
Equipment:	MALS, HIRLs, PAPI	☐ meets	existing PAPI
Secondary Approach (Different Runway End)			
BENCHMARK		**RUNWAY 12**	
Approach:	Ground-based	☐ meets	n/a (no ground-based approach available)
Ceiling:	400 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Approach:	LPV	☐ meets	RNAV (GPS) RWY 12 - LNAV
Ceiling:	250 AGL	☐ meets	
Visibility:	1 statute mile	☑ meets	
Equipment:	REILs, HIRLs, PAPI	☐ meets	existing REILs, PAPI

Additional Requirements			
Weather:	on-field, 24/7, data-linked	☑ meets	
Access to ATC Clearance:	RTR	☑ meets	
ADS-B Coverage:	On ground	☐ meets	

Overall Recommendations

GENERAL		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Weather Reporting Upgrade existing AWOS-III to include lightning and freezing rain sensor.	Improves information available to pilot.	$60,000
Communications Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	Improves pilot/controller communications and clearance delivery process.	Less than $5,000
Data link Provide ADS-B coverage while on the ground.	Provides traffic surveillance, terrain avoidance, weather data, etc. Crucial component for Next Generation Air Transportation System.	$100,000
Local Area Augmentation System (LAAS) Provide LAAS coverage to augment existing global positioning system.	Provides enhanced signal accuracy.	Unknown

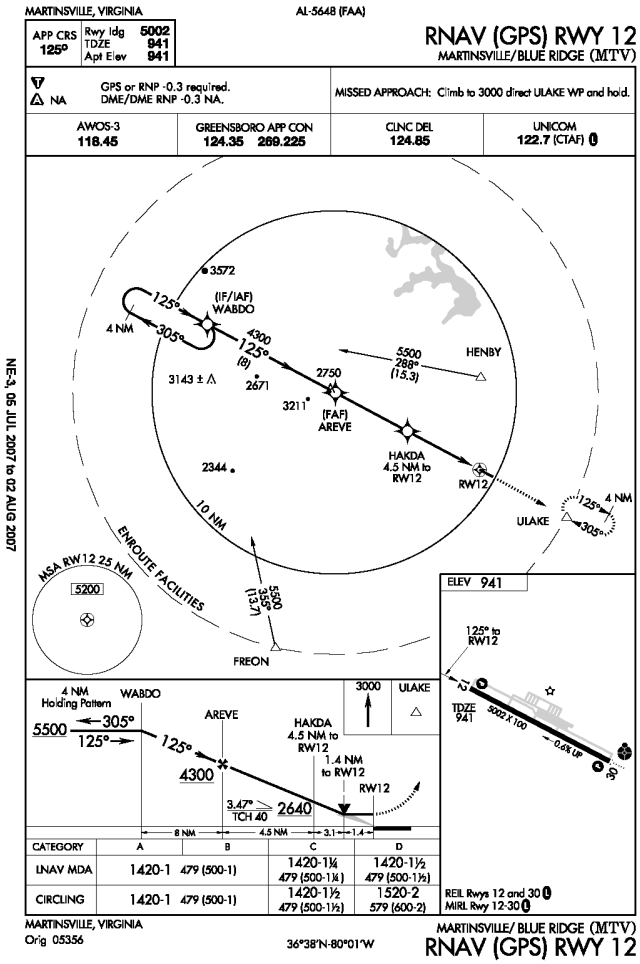
RUNWAY 12 30		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Airfield Lighting Control Change control sequence and/or facility directory note for MIRLs to be preset on low intensity with higher intensity activated on CTAF.	Provides visibilty of landing environment during night and adverse weather conditions even during times of aircraft equipment failure or pilot control system malfunction.	Less than $10,000

Overall Recommendations

RUNWAY 12		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions (tree).	Standards.	Varies
Aeronautical Survey Request / complete aeronautical survey to enable development of LPV approach to Runway 12.	Provides survey data for instrument approach procedures.	Underway
New Procedure Request development of RNAV (GPS) RWY 12 Approach with LPV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost

RUNWAY 30		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions (tree).	Standards.	Varies
Runway End Identifier Lights Confirm presence of REILs and ODALS; remove REILs.	FAA standards allow for removal of REILs when approach lighting system present.	$10,000
Approach Lighting System Upgrade Runway 30 ODALS to MALS.	Improves pilot's ability to detect the landing environment.	$400,000

Procedure Overview



RNAV (GPS) RWY 12 - LNAV

FAA PROCEDURE DATA		
Critical Obstacle:	1183	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:	-14	**see note 2**
Rounding Adjustment:	1	
Minimum Descent Altitude / Decision Height:	1420	

Note 1: 60' Tree

Note 2: secondary area adjustment

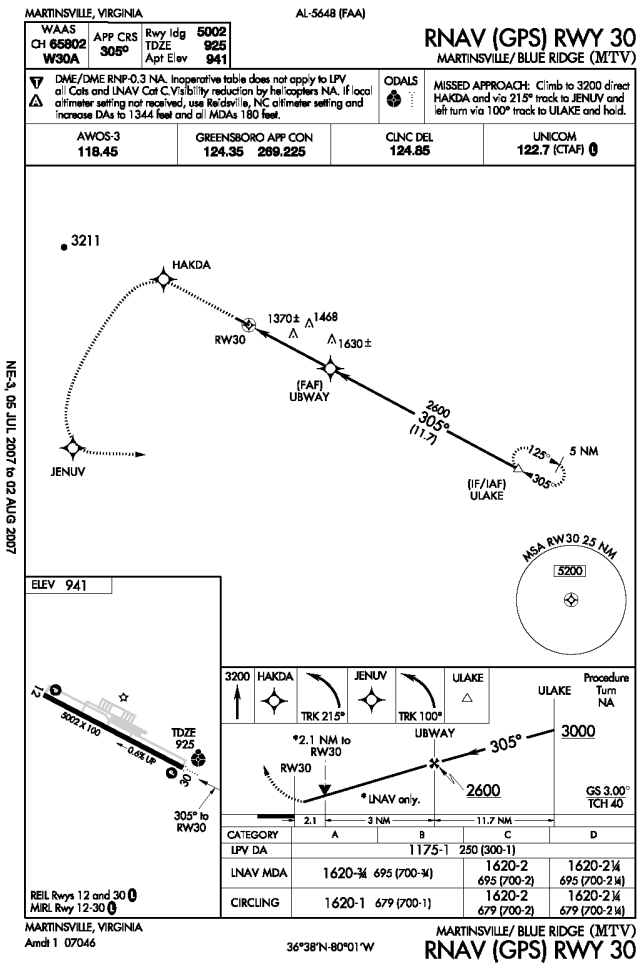
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Overview



RNAV (GPS) RWY 30 - LPV

FAA PROCEDURE DATA	
Critical Obstacle:	**see note 1**
Required Obstacle Clearance:	
Remote Altimeter Adjustment:	
Accuracy Code Adjustment:	
Other Adjustment:	**see note 2**
Rounding Adjustment:	
Minimum Descent Altitude / Decision Height:	1175

Note 1: ASC

Note 2:

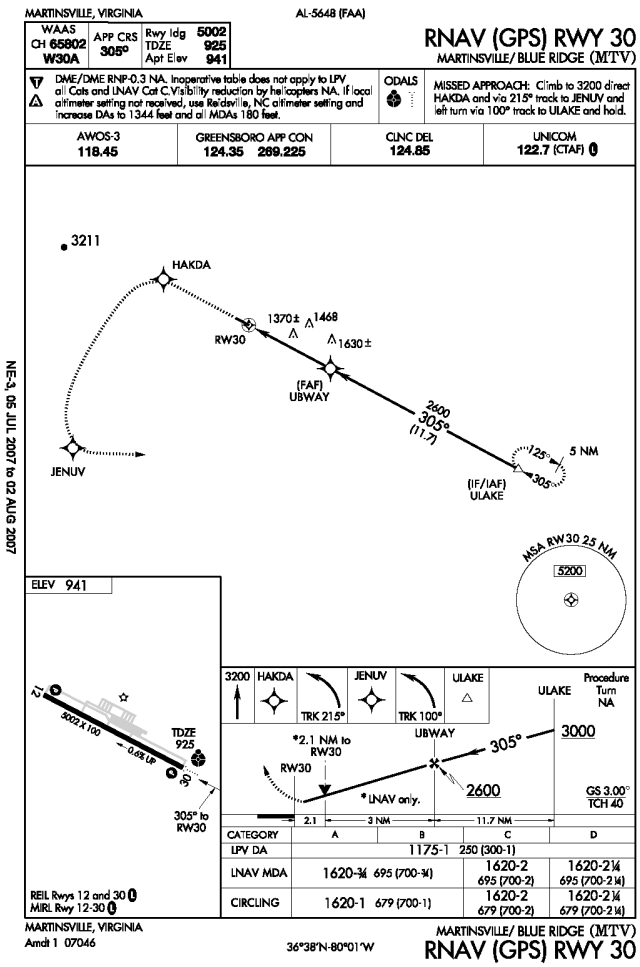
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1B - APPROACH PROCEDURE WITH VERTICAL GUIDANCE APPROACH REQUIREMENTS

	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	None
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 4 and 8, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Procedure Overview



RNAV (GPS) RWY 30 - LNAV

FAA PROCEDURE DATA		
Critical Obstacle:	1370	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	0	
Minimum Descent Altitude / Decision Height:	1620	

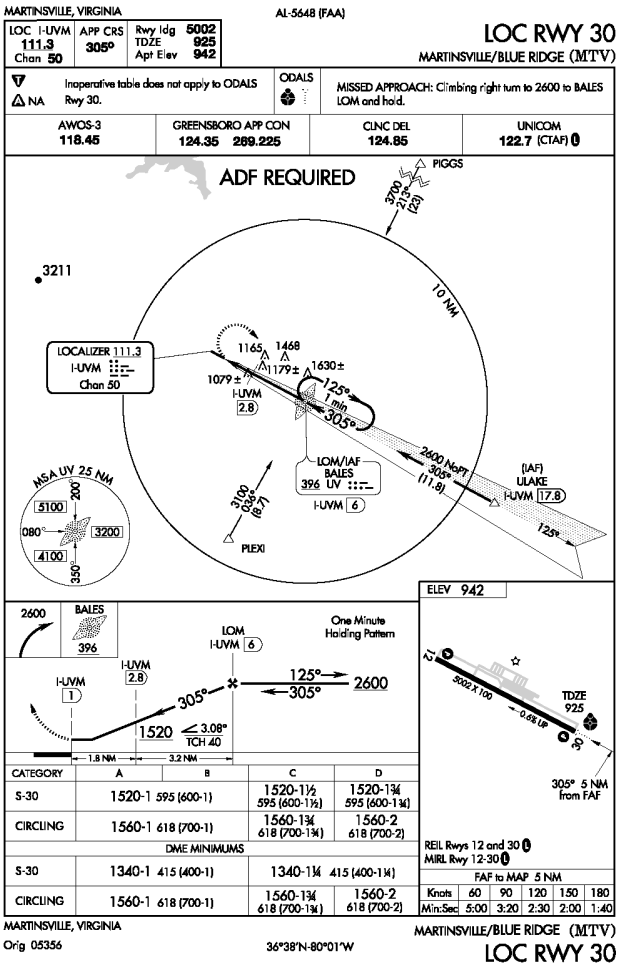
Note 1: Tree

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	<1 SM	**KNOWN DEFICIENCIES**
	REQUIRED	
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft (Paved)	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	Required	None
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 8, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Overview



LOC RWY 30

FAA PROCEDURE DATA		
Critical Obstacle:	1079	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	11	
Minimum Descent Altitude / Decision Height:	1340	

Note 1: 60' Tree

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	None
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Recommendations

RNAV (GPS) RWY 12		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a

RNAV (GPS) RWY 30		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Approach Lighting System Upgrade Runway 30 ODALS to MALS. See Overall Recommendations.	Lowers landing visibility minimum to 3/4 statute mile.	$400,000 (duplicate)

LOC RWY 30		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Approach Lighting System Upgrade Runway 30 ODALS to MALS. See Overall Recommendations.	Lowers landing visibility minimum to 3/4 statute mile.	$400,000 (duplicate)
Facility Replacement Replace problematic localizer.	Improves reliability.	$100,000

Bridgewater Airpark (VBW)

Bridgewater, Virginia

AIRPORT INFORMATION	
ROLE / CLASSIFICATION INFORMATION	
VATSP Classfication (2008):	Local Service
NPIAS Role (2008):	n/a
Study Classification:	Local Service

ACTIVITY INFORMATION	
Based Aircraft (2007):	42
Annual Operations (2020):	12877
Annual Enplanements (2020):	n/a

DEVELOPMENT INFORMATION (2008)	
Critical Airport Reference Code (Existing):	B-II
Critical Airport Reference Code (Proposed):	B-II
Airport Layout Plan (Original):	October, 1999
Airport Layout Plan (Revision):	n/a

Proposed Development (from ALD):
- Extend RWY 33 (1655')
- Construct parallel taxiway

AERONAUTICAL SURVEY INFORMATION

Runway End	Survey Type	Survey Date
all	Photoslope	2001

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS	
Available Weather Reporting:	None
Common Traffic Advisory Frequency:	122.7
Clearance Delivery:	Phone

Nearby Navigational Aids:

MONTEBELLO	VOR/DME	115.3	MOL	019°/ 28.8 NM TO FIELD
BRIDGEWATER	NDB	241	VBW	AT FIELD

Bridgewater Airpark (VBW)

Bridgewater, Virginia

Instrument Approach Procedure Summary

Minimums listed are Category B

EXISTING PROCEDURES		
CIRCLING		
NDB OR GPS-A	2300 - 1 1/4 (1135)	Amdt 4B

PROCEDURES PROPOSED AS PART OF STUDY
RNAV (GPS) - B - LNAV
RNAV (GPS) - B - LP
RNAV (GPS) RWY 33 - LNAV
RNAV (GPS) RWY 33 - LP

VISIBILITY CHANGES PROPOSED AS PART OF STUDY	
none	

REVIEWER COMMENTS

A detailed survey is required to determine if RNAV (GPS) - LP and RNAV (GPS) - LNAV approaches can be developed for either runway. If not, the Study recommends the development of a circle-to-land RNAV (GPS) - LP and RNAV (GPS) - LNAV procedures.

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 15 33 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	B-II	B-II
Runway Dimensions (Length x Width in ft):	2745 x 60	4000 x 75
Runway to Taxiway Separation (feet):	none	240
Runway Lighting:	MIRL	MIRL
RUNWAY 15		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	250 x 450 x 1000	250 x 450 x 1000
Runway Markings:	Visual	Visual
Available Visual Approach Aids:	APAP	PAPI
RUNWAY 33		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	250 x 450 x 1000	250 x 450 x 1000
Runway Markings:	Visual	Visual
Available Visual Approach Aids:	APAP	PAPI

Overall Recommendations

GENERAL		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Altimeter Source Install AWOS-A.	Provides local altimeter source.	$25,000
Communications Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	Improves pilot/controller communications and clearance delivery process.	Less than $5,000
Aeronautical Survey Request / complete aeronautical survey to enable development of LP and LNAV or circle-to-land approach to Runway 15 or Runway 33.	Provides survey data for instrument approach procedures.	$50,000
New Procedure Request development of RNAV (GPS) RWY 15 or RNAV (GPS) RWY 33 or circle-to-land approach with LP and/or LNAV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost

RUNWAY 15 33		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Airfield Lighting Control Change control sequence and/or facility directory note for MIRLs to be preset on low intensity with higher intensity activated on CTAF.	Provides visibilty of landing environment during night and adverse weather conditions even during times of aircraft equipment failure or pilot control system malfunction.	Less than $10,000

Overall Recommendations

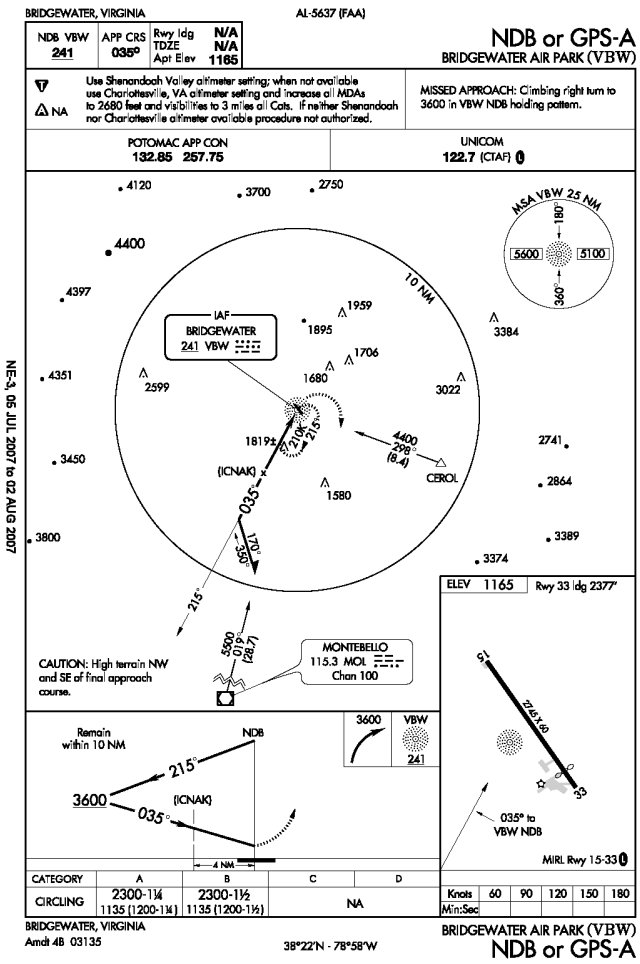
RUNWAY 15		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions (trees).	Standards.	Varies
Runway End Identifier Lights Install REILs for Runway 15.	Improves pilot's ability to detect the landing environment.	$50,000
Precision Approach Path Indicator Install 4-box PAPI for Runway 15.	Provides visual vertical descent guidance information during the approach to the runway.	$70,000

RUNWAY 33		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions.	Standards.	Varies
Runway End Identifier Lights Install REILs for Runway 33.	Improves pilot's ability to detect the landing environment.	$50,000
Precision Approach Path Indicator Install 4-box PAPI for Runway 33.	Provides visual vertical descent guidance information during the approach to the runway.	$70,000

Bridgewater Airpark (VBW)

Bridgewater, Virginia

Procedure Overview



NDB OR GPS-A

FAA PROCEDURE DATA		
Critical Obstacle:	1819	**see note 1**
Required Obstacle Clearance:	350	
Remote Altimeter Adjustment:	10	
Accuracy Code Adjustment:		
Other Adjustment:	120	**see note 2**
Rounding Adjustment:	1	
Minimum Descent Altitude / Decision Height:	2300	

Note 1: Terr 2.2SW VBW

Note 2: unknown missing Amd 4B Form 8260

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	CIRCLING REQUIRED	KNOWN DEFICIENCIES
TERPS Paragraph 251	20:1 Clear	Yes
Airport Layout Plan	Recommended	None
Minimum Runway Length	3,200 ft	Yes
Runway Markings	Visual (Basic)	None
Holding Position Signs and Markings	Visual (Basic)	None
Runway Edge Lights	MIRL / LIRL (for night minima only)	None
Parallel Taxiway	Recommended	Yes
Approach Lights	Not Required	None
Runway Design Standards	Not Required	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-2, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Recommendations

NDB OR GPS A		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Altimeter Source Install AWOS-A and request FAA re-evaluation of remote altimeter setting source penalty. See Overall Recommendations.	Minimum Descent Altitude (MDA) may be reduced by up to 20 feet by eliminating the remote altimeter setting source (RASS) adjustment.	$25,000 (duplicate)

Brookneal/Campbell County (0V4)

Brookneal, Virginia

AIRPORT INFORMATION	
ROLE / CLASSIFICATION INFORMATION	
VATSP Classfication (2008):	General Aviation Community
NPIAS Role (2008):	General Aviation
Study Classification:	General Aviation Community

ACTIVITY INFORMATION	
Based Aircraft (2007):	0
Annual Operations (2020):	834
Annual Enplanements (2020):	n/a

DEVELOPMENT INFORMATION (2008)	
Critical Airport Reference Code (Existing):	n/a
Critical Airport Reference Code (Proposed):	n/a
Airport Layout Plan (Original):	November, 1981
Airport Layout Plan (Revision):	n/a

Proposed Development (from ALD):
- Construct parallel taxiway
- Extend RWY 6 (600')
- Extend RWY 24 (400')

AERONAUTICAL SURVEY INFORMATION

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS	
Available Weather Reporting:	None
Common Traffic Advisory Frequency:	122.7
Clearance Delivery:	Phone

Nearby Navigational Aids:

SOUTHBOSTON	VORTAC	110.4	SBV	005°/ 28.0 NM TO FIELD
LYNCHBURG	VORTAC	109.2	LYH	128°/ 12.5 NM TO FIELD
BOJAR	NDB	385	LYH	132°/ 13.0 NM TO FIELD

Brookneal/Campbell County (0V4)

Brookneal, Virginia

Instrument Approach Procedure Summary

Minimums listed are Category B

EXISTING PROCEDURES		
CIRCLING		
VOR/DME-A	1160 - 1 (564)	Amdt 1
RUNWAY 24		
RNAV (GPS) RWY 24 - LNAV	980 - 1 (384)	Orig

PROCEDURES PROPOSED AS PART OF STUDY
RNAV (GPS) RWY 6 - LNAV
RNAV (GPS) RWY 6 - LP or LPV

VISIBILITY CHANGES PROPOSED AS PART OF STUDY	
none	

REVIEWER COMMENTS

A new approach to Runway 6 would eliminate the requirement for circle-to-land operations when the wind and weather conditions favor landing to the northeast. Landing minima to all approaches can be improved by elimination of the Remote Altimeter Setting Source adjustment. The Airport Sponsor completed the requested informational survey.

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 6 24 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	B-II (small)	B-II
Runway Dimensions (Length x Width in ft):	3798 x 60	4800 x 75
Runway to Taxiway Separation (feet):	none	250
Runway Lighting:	MIRL	MIRL
RUNWAY 6		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	250 x 450 x 1000	500 x 700 x 1000
Runway Markings:	Visual	Non-Precision
Available Visual Approach Aids:	none	VASI; REILs
RUNWAY 24		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	250 x 450 x 1000	500 x 700 x 1000
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	none	VASI; REILs

Brookneal/Campbell County (0V4)

Brookneal, Virginia

System Benchmarks

General Aviation Community			
Best Approach (Primary Runway End)			
BENCHMARK		**RUNWAY 24**	
Approach:	Ground-based	☐ meets	n/a (no ground-based approach available)
Ceiling:	500 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Approach:	LNAV	☑ meets	RNAV (GPS) RWY 24 - LNAV
Ceiling:	400 AGL	☑ meets	
Visibility:	1 statute mile	☑ meets	
Equipment:	REILs, MIRLs, PAPI	☐ meets	
Secondary Approach (Different Runway End)			
BENCHMARK		**RUNWAY 6**	
Approach:		☐ meets	n/a (no ground-based approach available)
Ceiling:		☐ meets	
Visibility:		☐ meets	
Approach:	LNAV	☐ meets	n/a (no satellite-based approach available)
Ceiling:	500 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Equipment:	REILs, MIRLs, PAPI	☐ meets	

Additional Requirements			
Weather:	Normally on-field, 24/7, data-linked	☐ meets	
Access to ATC Clearance:	RTR or GCO	☐ meets	
ADS-B Coverage:	1000 AGL	☐ meets	

Overall Recommendations

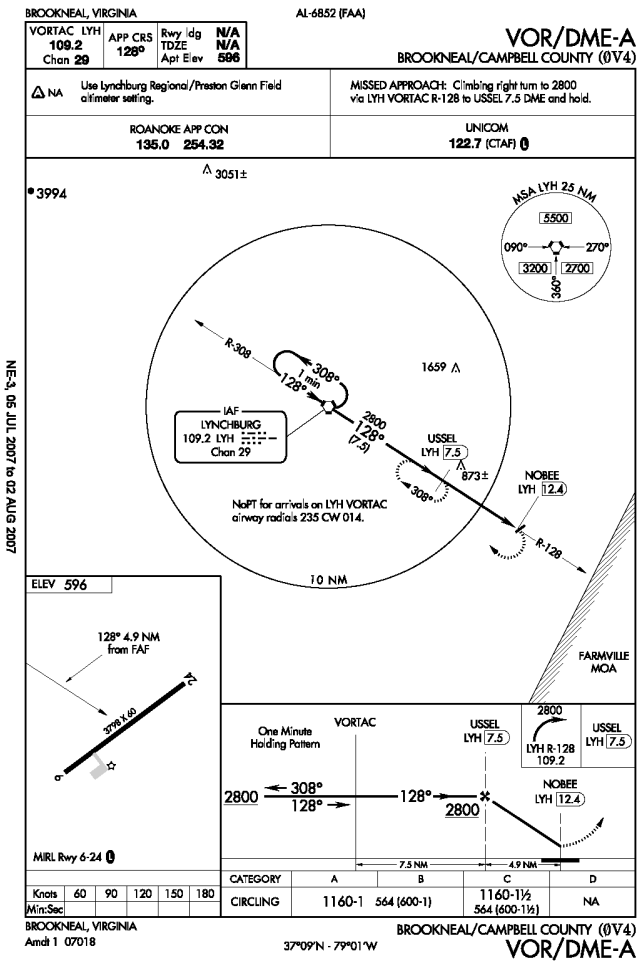
GENERAL		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Altimeter Source Install AWOS-A.	Provides local altimeter source.	$25,000
Communications Install a Ground Communication Outlet (GCO) directly with Roanoke Approach.	Provides direct communication with approach control via radio and an "on-demand" telephone land line link. Used by aircraft on ground for obtaining or canceling IFR clearances.	$20,000
Communications Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	Improves pilot/controller communications and clearance delivery process.	Less than $5,000
Data link Provide ADS-B coverage at 1000 AGL or lower.	Provides traffic surveillance, terrain avoidance, weather data, etc. Crucial component for Next Generation Air Transportation System.	Unknown

Overall Recommendations

RUNWAY 6		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions (trees).	Standards.	Varies
Runway End Identifier Lights Install REILs for Runway 6.	Improves pilot's ability to detect the landing environment.	$50,000
Precision Approach Path Indicator Install 4-box PAPI for Runway 6.	Provides visual vertical descent guidance information during the approach to the runway.	$70,000
Aeronautical Survey Request / complete aeronautical survey to enable development of LNAV and LP or LPV approach to Runway 6.	Provides survey data for instrument approach procedures.	$50,000
New Procedure Request development of RNAV (GPS) RWY 6 Approach with LP or LPV and LNAV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost

RUNWAY 24		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions (trees).	Standards.	Varies
Runway End Identifier Lights Install REILs for Runway 24.	Improves pilot's ability to detect the landing environment.	$50,000
Precision Approach Path Indicator Install 4-box PAPI for Runway 24.	Provides visual vertical descent guidance information during the approach to the runway.	$70,000

Procedure Overview



VOR/DME-A

FAA PROCEDURE DATA		
Critical Obstacle:	779	**see note 1**
Required Obstacle Clearance:	300	
Remote Altimeter Adjustment:	81	
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:		
Minimum Descent Altitude / Decision Height:	1160	

Note 1: 60' Tree 2C

Note 2:

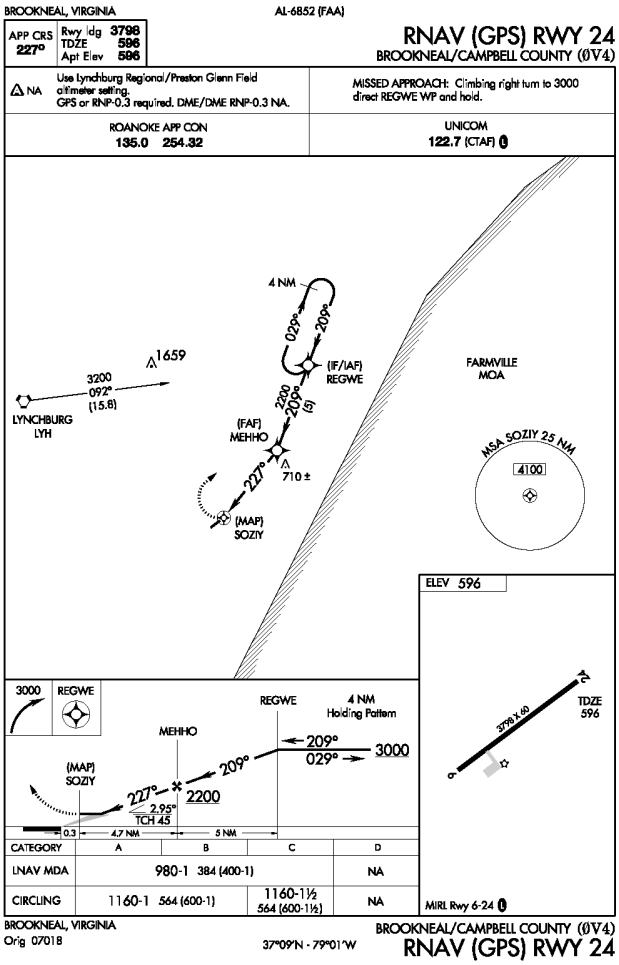
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	CIRCLING	KNOWN DEFICIENCIES
	REQUIRED	
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Recommended	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Visual (Basic)	None
Holding Position Signs and Markings	Visual (Basic)	None
Runway Edge Lights	MIRL / LIRL (for night minima only)	None
Parallel Taxiway	Recommended	Yes
Approach Lights	Not Required	None
Runway Design Standards	Not Required	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-2, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Overview



RNAV (GPS) RWY 24 - LNAV

FAA PROCEDURE DATA		
Critical Obstacle:	649	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:	81	
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:		
Minimum Descent Altitude / Decision Height:	980	

Note 1: 60' Tree 2C

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	1 SM	**KNOWN DEFICIENCIES**
	REQUIRED	
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	Yes
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Recommendations

VOR / DME A		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Altimeter Source Install AWOS-A and request FAA re-evaluation of remote altimeter setting source penalty. See Overall Recommendations.	Minimum Descent Altitude (MDA) may be reduced by 80 to 100 feet by eliminating the remote altimeter setting source (RASS) adjustment.	$25,000 (duplicate)

RNAV (GPS) RWY 24		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Altimeter Source Install AWOS-A and request FAA re-evaluation of remote altimeter setting source penalty. See Overall Recommendations.	Minimum Descent Altitude (MDA) may be reduced by 80 to 100 feet by eliminating the remote altimeter setting source (RASS) adjustment.	$25,000 (duplicate)

Charlottesville-Albemarle (CHO)

Charlottesville, Virginia

AIRPORT INFORMATION	
ROLE / CLASSIFICATION INFORMATION	
VATSP Classfication (2008):	Commercial Service
NPIAS Role (2008):	Primary, Non Hub
Study Classification:	Commercial Service (<1 million, >= 200k enplanements)

ACTIVITY INFORMATION	
Based Aircraft (2007):	94
Annual Operations (2020):	128468
Annual Enplanements (2020):	274910
DEVELOPMENT INFORMATION (2008)	
Critical Airport Reference Code (Existing):	C-III
Critical Airport Reference Code (Proposed):	C-III
Airport Layout Plan (Original):	December, 2004
Airport Layout Plan (Revision):	August, 2006

Proposed Development (from ALD):

- Install MALSR (RWY 21)
- Extend RWY 21 (800')
- Extend RWY 21 (400')
- Upgrade RWY 21 RPZ
- Install LOC (RWY 21)

AERONAUTICAL SURVEY INFORMATION

Runway End	Survey Type	Survey Date
all	Photoslope	2001
all	OC-CHO 765	2006
21	C	2006
3	PIR	2006

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS	
Available Weather Reporting:	ASOS
Common Traffic Advisory Frequency:	124.5
Clearance Delivery:	Direct

Nearby Navigational Aids:

GORDONSVILLE	VORTAC	115.6	GVE	304°/ 16 NM TO FIELD
AZALEA PARK	NDB	336	AZS	030°/ 8.3 NM TO FIELD

Charlottesville-Albemarle (CHO)

Charlottesville, Virginia

Instrument Approach Procedure Summary

Minimums listed are Category B

EXISTING PROCEDURES		
RUNWAY 21		
RNAV (GPS) Y RWY 21 - LNAV	1380 - 1 (752)	Amdt 1
RNAV (GPS) Z RWY 21 - LPV	878 - 1 (250)	Orig
RUNWAY 3		
ILS OR LOC RWY 3 - ILS	856 - 1/2 (217)	Amdt 13
ILS OR LOC RWY 3 - LOC	1380 - 1/2 (741)	Amdt 13
RNAV (GPS) RWY 3 - LNAV	1120 - 1/2 (461)	Amdt 1
RNAV (GPS) RWY 3 - VNAV	1100 - 1 (461)	Amdt 1

PROCEDURES PROPOSED AS PART OF STUDY
ILS or LOC RWY 21 - ILS
ILS or LOC RWY 21 - LOC
LOC RWY 3 (update existing)
RNAV (GPS) RWY 3 - LPV

VISIBILITY CHANGES PROPOSED AS PART OF STUDY	
RUNWAY 3:	1/2 SM to 1800 RVR
RUNWAY 21:	1 SM to 2400 RVR

REVIEWER COMMENTS

All of the existing ground-based approach procedures depend upon the RWY 3 localizer. For redundancy, the Study strongly recommends that a second localizer be installed for RWY 21. This would also eliminate the circle-to-land requirement for non-GPS equipped aircraft when winds favor Runway 21. ILS RWY 3 has non-standard minimums which may be corrected by removal of the critical obstacle in the missed approach area. LOC RWY 3 has a very high ceiling minimum which may be lowered through a DME step-down fix. The Study recommends a reduction in landing visibility minimums. Additional information regarding the estimated impacts and costs associated with the visibility changes is included in Appendix E. The Airport Sponsor completed the requested informational survey.

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 3 21 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	C-III	C-III
Runway Dimensions (Length x Width in ft):	6001 x 150	6800/7200 x 150
Runway to Taxiway Separation (feet):	400	400
Runway Lighting:	HIRL	HIRL
RUNWAY 3		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	1000 x 1750 x 2500	1000 x 1750 x 2500
Runway Markings:	Precision	Precision
Available Visual Approach Aids:	MALSR	PAPI; MALSR
RUNWAY 21		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 1010 x 1700	1000 x 1750 x 2500
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	VASI; REILs	PAPI; MALSR

Charlottesville-Albemarle (CHO)

Charlottesville, Virginia

System Benchmarks

Commercial Service (<1 million, > 200k enplanements)			
Best Approach (Primary Runway End)			
BENCHMARK		**RUNWAY 3**	
Approach:	ILS CAT I	☑ meets	ILS OR LOC RWY 3 - ILS
Ceiling:	200 AGL	☐ meets	
Visibility:	1800 RVR	☐ meets	
Approach:	LPV	☐ meets	RNAV (GPS) RWY 3 - LNAV
Ceiling:	200 AGL	☐ meets	
Visibility:	1800 RVR	☐ meets	
Equipment:	ALSF-2 or MALSR, TDZ, CL, HIRLs, RVR, PAPI	☐ meets	existing MALSR, HIRLs
Secondary Approach (Different Runway End)			
BENCHMARK		**RUNWAY 21**	
Approach:	ILS CAT I	☐ meets	n/a (no ground-based approach available)
Ceiling:	200 AGL	☐ meets	
Visibility:	2400 RVR	☐ meets	
Approach:	LPV	☑ meets	RNAV (GPS) Z RWY 21 - LPV
Ceiling:	200 AGL	☐ meets	
Visibility:	2400 RVR	☐ meets	
Equipment:	ALSF-2 or MALSR, TDZ, CL, HIRLs, RVR, PAPI	☐ meets	existing HIRLs

Additional Requirements			
Weather:	on-field, 24/7, data-linked	☑ meets	
Access to ATC Clearance:	Direct	☑ meets	
ADS-B Coverage:	On ground	☐ meets	

Overall Recommendations

GENERAL		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Data link Provide ADS-B coverage while on the ground.	Provides traffic surveillance, terrain avoidance, weather data, etc. Crucial component for Next Generation Air Transportation System.	$100,000
Local Area Augmentation System (LAAS) Provide LAAS coverage to augment existing global positioning system.	Provides enhanced signal accuracy.	Unknown
RUNWAY 3 21		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Runway Lighting Install centerline lights for Runway 3-21.	Improves visibility of runway environment, allows lower landing and take-off visibility minima, maintains landing visibiliity minima below 3/4 statute mile when runway markings are obscured by snow (TERPS 3.1.3).	$800,000

Overall Recommendations

RUNWAY 3		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Precision Approach Path Indicator Install 4-box PAPI for Runway 3.	Provides visual vertical descent guidance information during the approach to the runway.	$200,000
Runway Lighting Install touchdown zone lights for Runway 3.	Improves visibility of runway environment, allows lower landing visibility minima, maintains landing visibiliity minima below 3/4 statute mile when runway markings are obscured by snow (TERPS 3.1.3).	$800,000
Weather Reporting Install Runway Visual Range (RVR) equipment.	Reduces visibility minima to as low as 1800 feet RVR (in lieu of prevailing visibility).	$400,000
Visibility Minimum Upon installation of runway visual range equipment, request procedure be updated to 2400 RVR. Upon installation of centerline and touchdown zone lighting, request procedure be updated to 1800 RVR.	Lower landing visibility minimum.	No equipment cost
New Procedure Request development of RNAV (GPS) RWY 3 Approach with LPV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost

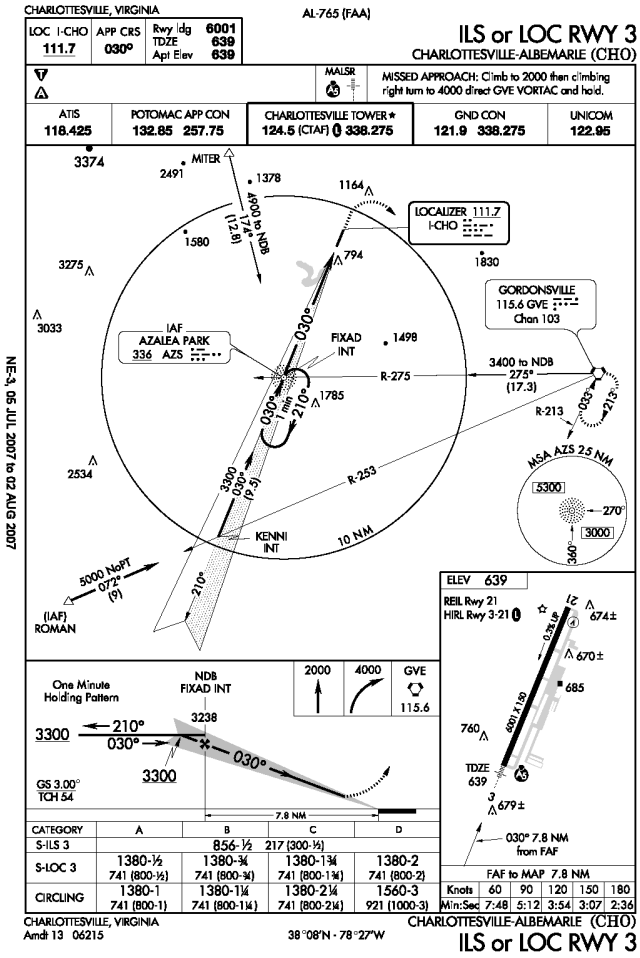
Overall Recommendations

RUNWAY 21		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Precision Approach Path Indicator Upgrade Runway 21 VASI to a 4-box PAPI.	Provides improved visual vertical descent guidance information during the approach to the runway.	$200,000
Approach Lighting System Install MALSR for Runway 21.	Improves pilot's ability to detect the landing environment.	$1,250,000
Weather Reporting Install Runway Visual Range (RVR) equipment.	Reduces visibility minima to as low as 2400 feet RVR (in lieu of prevailing visibility).	$400,000 (duplicate)
Visibility Minimum Upon installation of approach lighting system, request procedure be updated to 1/2 statute mile visibility or 2400 RVR with installation of RVR.	Lower landing visibility minimum.	$600,000
Aeronautical Survey Request / update aeronautical survey to enable development of ILS approach to Runway 21.	Provides survey data for instrument approach procedures.	$50,000
New Procedure Request development of ILS RWY 21 and LOC RWY 21.	Improve all-weather capability of the runway and airport. LOC RWY 21 may lower the ground-based approach minimums to 980-2400 (352) and will provide second ground based approach to the airport.	$2,000,000

Charlottesville-Albemarle (CHO)

Charlottesville, Virginia

Procedure Overview



ILS OR LOC RWY 3 - ILS

FAA PROCEDURE DATA	
Critical Obstacle:	**see note 1**
Required Obstacle Clearance:	
Remote Altimeter Adjustment:	
Accuracy Code Adjustment:	
Other Adjustment:	17 **see note 2**
Rounding Adjustment:	
Minimum Descent Altitude / Decision Height:	856

Note 1: ASC

Note 2: missed approach segment

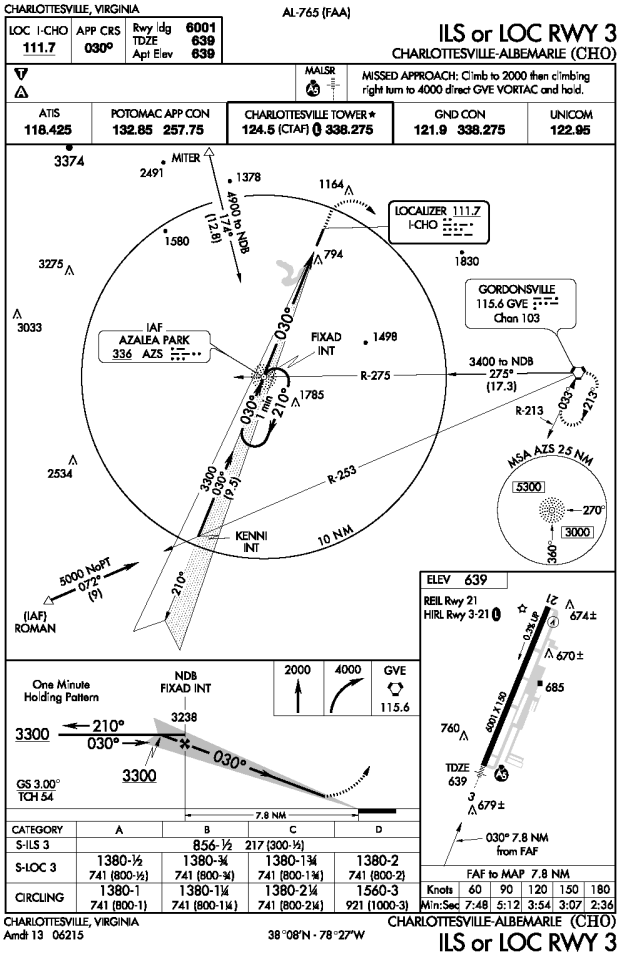
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1A - PRECISION INSTRUMENT APPROACH REQUIREMENTS		
	<3/4 SM	**KNOWN DEFICIENCIES**
	REQUIRED	
TERPS Paragraph 251	34:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	4,200 ft (Paved)	None
Runway Markings	Precision	None
Holding Position Signs and Markings	Precision	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	MALSR, SSALR, or ALSF	None
Runway Design Standards	<3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 9, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Charlottesville-Albemarle (CHO)

Charlottesville, Virginia

Procedure Overview



ILS OR LOC RWY 3 - LOC

FAA PROCEDURE DATA		
Critical Obstacle:	979	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:	91	**see note 2**
Rounding Adjustment:	60	
Minimum Descent Altitude / Decision Height:	1380	

Note 1: 100' Tree 2C

Note 2: XL

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

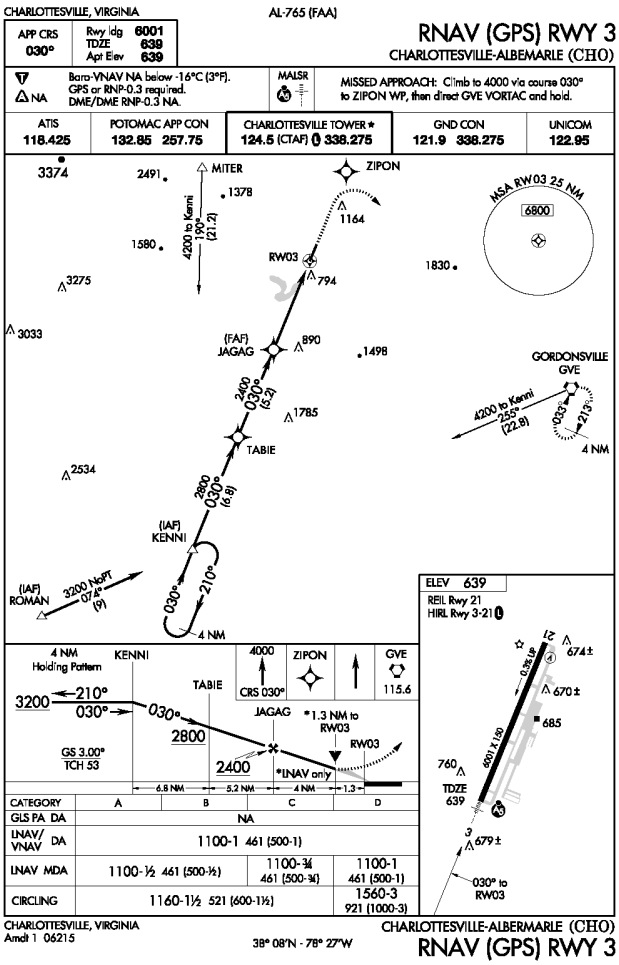
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	<3/4 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	34:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	4,200 ft (Paved)	None
Runway Markings	Precision	None
Holding Position Signs and Markings	Precision	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	MALSR, SSALR, or ALSF Required	None
Runway Design Standards	<3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 9, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Charlottesville-Albemarle (CHO)

Charlottesville, Virginia

Procedure Overview



RNAV (GPS) RWY 3 - VNAV

FAA PROCEDURE DATA	
Critical Obstacle:	753 **see note 1**
Required Obstacle Clearance:	
Remote Altimeter Adjustment:	
Accuracy Code Adjustment:	
Other Adjustment:	71 **see note 2**
Rounding Adjustment:	
Minimum Descent Altitude / Decision Height:	1100

Note 1: OL/TWR 1A

Note 2: MA20 XP51

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

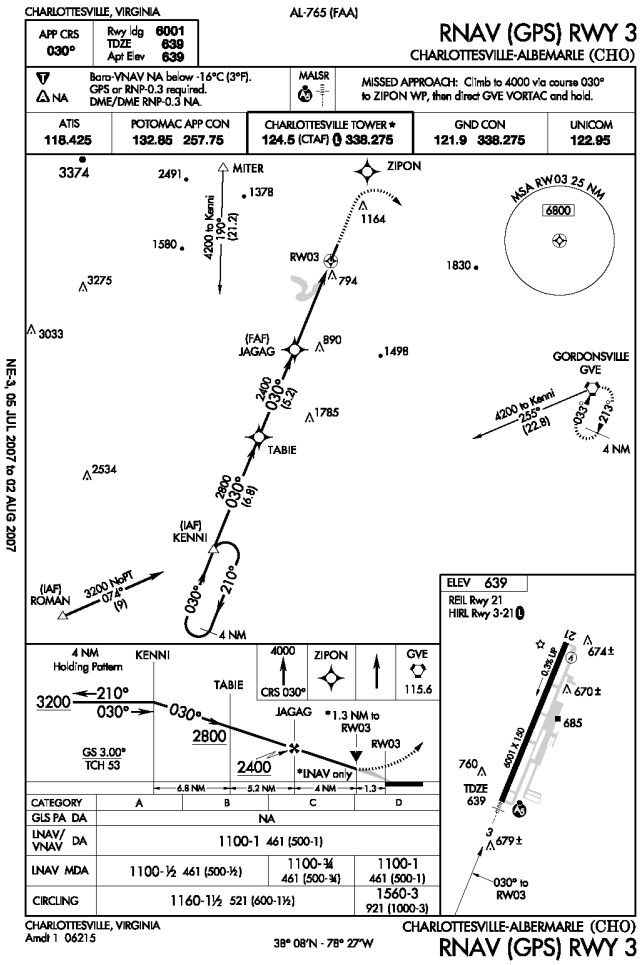
TABLE A16-1B - APPROACH PROCEDURE WITH VERTICAL GUIDANCE APPROACH REQUIREMENTS

	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	None
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 4 and 8, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Charlottesville-Albemarle (CHO)

Charlottesville, Virginia

Procedure Overview



RNAV (GPS) RWY 3 - LNAV

FAA PROCEDURE DATA		
Critical Obstacle:	890	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:	50	
Other Adjustment:	-85	**see note 2**
Rounding Adjustment:	15	
Minimum Descent Altitude / Decision Height:	1120	

Note 1: Towers 2 4D

Note 2: calc are for amdt 2

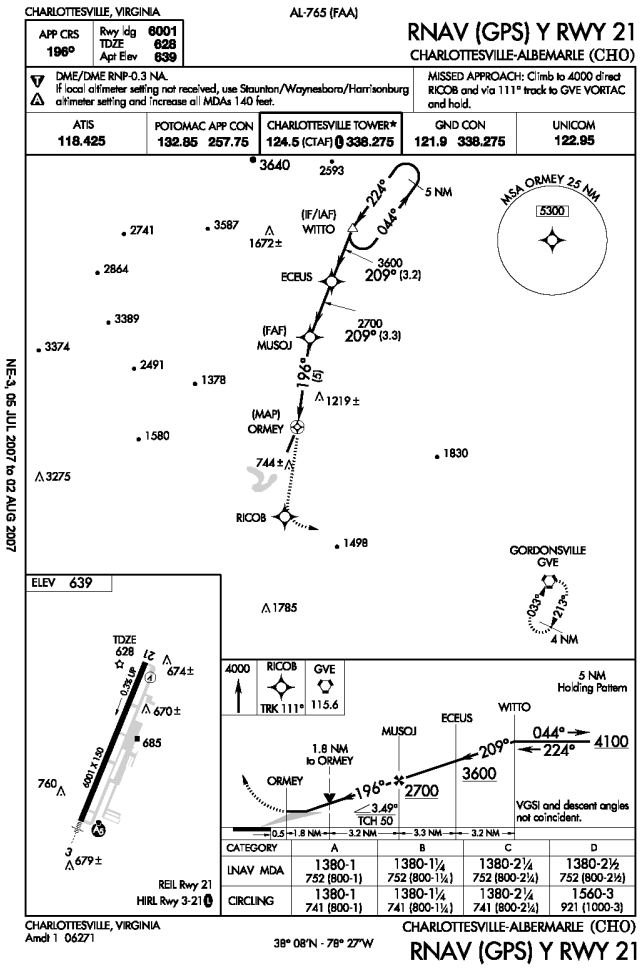
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	<3/4 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	34:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	4,200 ft (Paved)	None
Runway Markings	Precision	None
Holding Position Signs and Markings	Precision	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	MALSR, SSALR, or ALSF Required	None
Runway Design Standards	<3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 9, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Procedure Overview



RNAV (GPS) Y RWY 21 - LNAV

FAA PROCEDURE DATA		
Critical Obstacle:	1219	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:	-95	**see note 2**
Rounding Adjustment:	6	
Minimum Descent Altitude / Decision Height:	1380	

Note 1: 100' Tree 2C

Note 2: secondary area adjustment

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

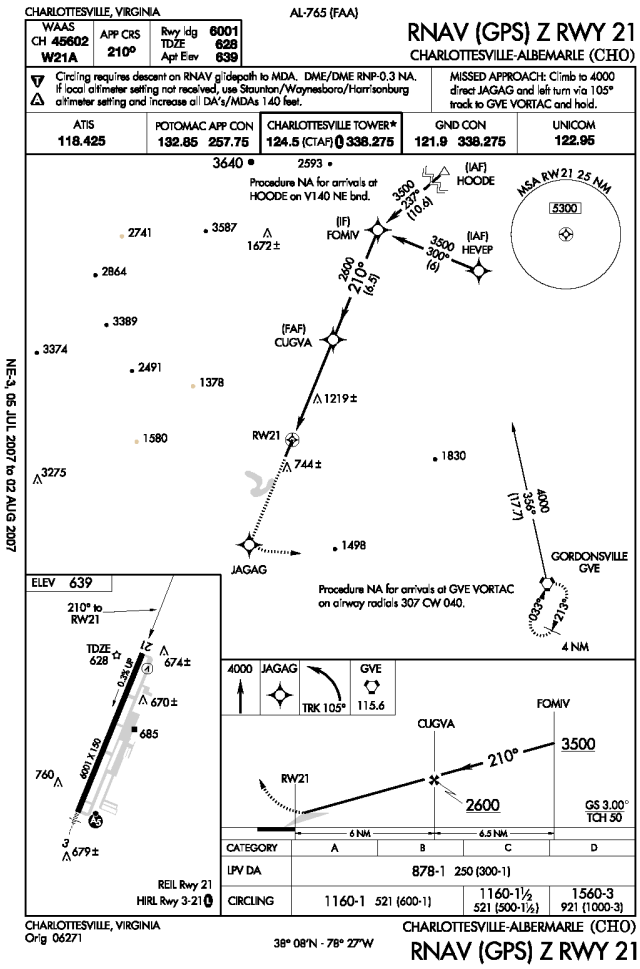
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	None
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Charlottesville-Albemarle (CHO)

Charlottesville, Virginia

Procedure Overview



RNAV (GPS) Z RWY 21 - LPV

FAA PROCEDURE DATA	
Critical Obstacle:	see note 1
Required Obstacle Clearance:	
Remote Altimeter Adjustment:	
Accuracy Code Adjustment:	
Other Adjustment:	see note 2
Rounding Adjustment:	
Minimum Descent Altitude / Decision Height:	878

Note 1: ASC

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1B - APPROACH PROCEDURE WITH VERTICAL GUIDANCE APPROACH REQUIREMENTS		
	1 SM	KNOWN DEFICIENCIES
	REQUIRED	
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	None
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 4 and 8, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Procedure Recommendations

ILS OR LOC RWY 3		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Critical Obstacle Verify removal of close-in obstacle on the ILS missed approach segment.	ILS Decision Altitude (DA) may be reduced by as much as 17 feet and standard ILS minimums of 200 - 1/2 may be obtained.	No equipment cost
Step-Down Fix Request localizer procedure be modified to include step-down fix.	Localizer Minimum Descent Altitude (MDA) may be reduced to as low as 1060 (421), or a reduction of 320 feet.	No equipment cost
Distance Measuring Equipment Install Distance Measuring Equipment (DME). Co-locate with the localizer.	Improves pilot's situational awareness. Provides method to establish a step-down fix and shorten final approach segment length.	$200,000
Marker Beacon Install an Outer Marker.	Improves pilot's situational awareness. Can be used to establish a step-down fix.	$50,000
Runway Lighting Install centerline lights for Runway 3-21. See Overall Recommendations.	Improves visibility of runway environment, allows lower landing and take-off visibility minima, maintains landing visibiliity minima below 3/4 statute mile when runway markings are obscured by snow (TERPS 3.1.3).	$800,000 (duplicate)
Runway Lighting Install touchdown zone lights for Runway 3. See Overall Recommendations.	Improves visibility of runway environment, allows lower landing visibility minima, maintains landing visibiliity minima below 3/4 statute mile when runway markings are obscured by snow (TERPS 3.1.3).	$800,000 (duplicate)
Weather Reporting Install Runway Visual Range (RVR) equipment. See Overall Recommendations.	Reduces visibility minima to as low as 1800 feet RVR (in lieu of prevailing visibility).	$400,000 (duplicate)

Procedure Recommendations

ILS OR LOC RWY 3		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Visibility Minimum Upon installation of runway visual range equipment, request procedure be updated to 2400 RVR. Upon installation of centerline and touchdown zone lighting, request procedure be updated to 1800 RVR.	Lower landing visibility minimum.	No equipment cost

RNAV (GPS) RWY 3		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Critical Obstacle Field verify critical obstacle to change accuracy code from "D" to "A" or 50 feet to 3 feet.	Minimum Descent Altitude (MDA) may be reduced by 40 to 60 feet.	Less than $10,000
Weather Reporting Install Runway Visual Range (RVR) equipment. See Overall Recommendations.	Reduces visibility minima to as low as 2400 feet RVR (in lieu of prevailing visibility).	$400,000 (duplicate)
Runway Lighting Install centerline lights for Runway 3-21. See Overall Recommendations.	Improves visibility of runway environment, allows lower landing and take-off visibility minima, maintains landing visibiliity minima below 3/4 statute mile when runway markings are obscured by snow (TERPS 3.1.3).	$800,000 (duplicate)
Runway Lighting Install touchdown zone lights for Runway 3. See Overall Recommendations.	Improves visibility of runway environment, allows lower landing visibility minima, maintains landing visibiliity minima below 3/4 statute mile when runway markings are obscured by snow (TERPS 3.1.3).	$800,000 (duplicate)
Weather Reporting Install Runway Visual Range (RVR) equipment. See Overall Recommendations.	Reduces visibility minima to as low as 1800 feet RVR (in lieu of prevailing visibility).	$400,000 (duplicate)
Visibility Minimum Upon installation of runway visual range equipment, request procedure be updated to 2400 RVR. Upon installation of centerline and touchdown zone lighting, request procedure be updated to 1800 RVR.	Lower landing visibility minimum.	No equipment cost

Procedure Recommendations

RNAV (GPS) Y RWY 21		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Approach Lighting System Install MALSR for Runway 21. See Overall Recommendations.	Lowers landing minimums to as low as 200 - 2400.	$1,250,000 (duplicate)
Weather Reporting Install Runway Visual Range (RVR) equipment. See Overall Recommendations.	Reduces visibility minima to as low as 2400 feet RVR (in lieu of prevailing visibility).	$400,000 (duplicate)

RNAV (GPS) Z RWY 21		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Approach Lighting System Install MALSR for Runway 21. See Overall Recommendations.	Lowers landing minimums to as low as 200 - 2400.	$1,250,000 (duplicate)
Weather Reporting Install Runway Visual Range (RVR) equipment.	Reduces visibility minima to as low as 2400 feet RVR (in lieu of prevailing visibility).	$400,000 (duplicate)

Chase City Municipal (CXE)

Chase City, Virginia

AIRPORT INFORMATION	
ROLE / CLASSIFICATION INFORMATION	
VATSP Classfication (2008):	Local Service
NPIAS Role (2008):	n/a
Study Classification:	Local Service

ACTIVITY INFORMATION	
Based Aircraft (2007):	5
Annual Operations (2020):	3337
Annual Enplanements (2020):	n/a
DEVELOPMENT INFORMATION (2008)	
Critical Airport Reference Code (Existing):	n/a
Critical Airport Reference Code (Proposed):	n/a
Airport Layout Plan (Original):	November, 1974
Airport Layout Plan (Revision):	n/a

Proposed Development (from ALD):
- Increase pavement strength to 15,000#
- Install VASIs
- Install REILs
- Upgrade to MIRL

AERONAUTICAL SURVEY INFORMATION

Runway End	Survey Type	Survey Date
all	Photoslope	2000

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS	
Available Weather Reporting:	None
Common Traffic Advisory Frequency:	122.9
Clearance Delivery:	Phone

Nearby Navigational Aids:

SOUTH BOSTON	VORTAC	110.4	SBV	080° / 25.6 NM TO FIELD
LAWRENCEVILLE	VORTAC	112.9	LVL	274° / 28.8 NM TO FIELD

Chase City Municipal (CXE)

Chase City, Virginia

Instrument Approach Procedure Summary

Minimums listed are Category B

EXISTING PROCEDURES		
RUNWAY 18		
RNAV (GPS) RWY 18 - LNAV	1100 - 1 (597)	Orig
RUNWAY 36		
RNAV (GPS) RWY 36 - LNAV	1040 - 1 (537)	Orig

VISIBILITY CHANGES PROPOSED AS PART OF STUDY	
none	

REVIEWER COMMENTS

Close-in obstructions need to be removed for night minimums to Runway 18.

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 18 36 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	n/a	n/a
Runway Dimensions (Length x Width in ft):	3400 x 50	3400 x 50
Runway to Taxiway Separation (feet):	none	none
Runway Lighting:	LIRL	MIRL
RUNWAY 18		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	250 x 450 x 1000	250 x 450 x 1000
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	VASI (tri-color)	VASI; REILs
RUNWAY 36		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	250 x 450 x 1000	250 x 450 x 1000
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	VASI (tri-color)	VASI; REILs

Overall Recommendations

GENERAL		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Altimeter Source Install AWOS-A.	Provides local altimeter source.	$25,000
Communications Install a Ground Communication Outlet (GCO) directly with Washington Center.	Provides direct communication with approach control via radio and an "on-demand" telephone land line link. Used by aircraft on ground for obtaining or canceling IFR clearances.	$20,000
Communications Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	Improves pilot/controller communications and clearance delivery process.	Less than $5,000

RUNWAY 18		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions (trees).	Standards. Required for authorization for night approaches.	Varies
Precision Approach Path Indicator Install 4-box PAPI for Runway 18.	Provides visual vertical descent guidance information during the approach to the runway.	$70,000
Runway End Identifier Lights Install REILs for Runway 18.	Improves pilot's ability to detect the landing environment.	$50,000

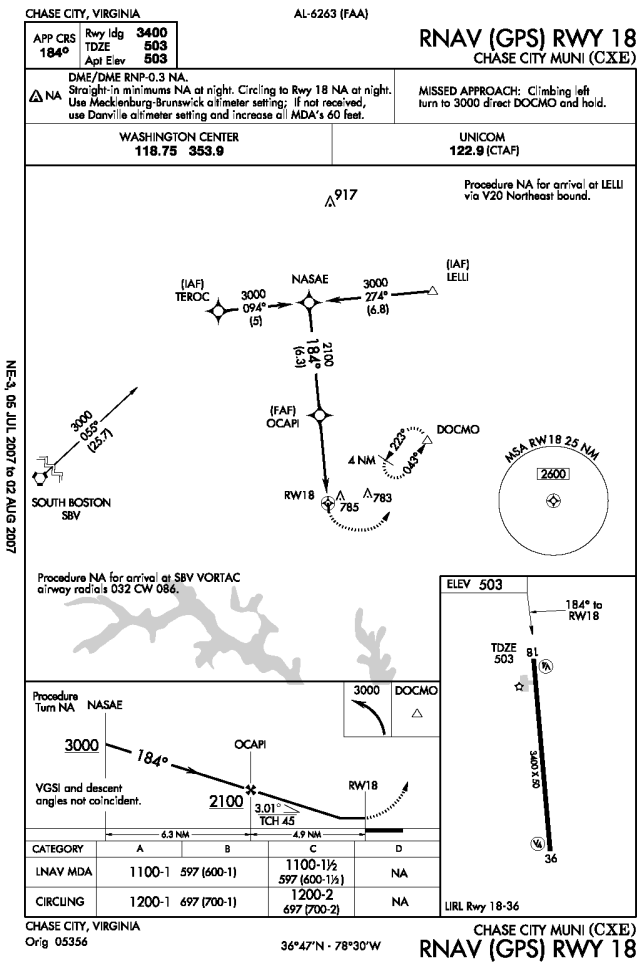
Overall Recommendations

RUNWAY 36		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions (trees).	Standards.	Varies
Precision Approach Path Indicator Install 4-box PAPI for Runway 36.	Provides visual vertical descent guidance information during the approach to the runway.	$70,000
Runway End Identifier Lights Install REILs for Runway 36.	Improves pilot's ability to detect the landing environment.	$50,000

Chase City Municipal (CXE)

Chase City, Virginia

Procedure Overview



RNAV (GPS) RWY 18 - LNAV

FAA PROCEDURE DATA		
Critical Obstacle:	785	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:	61	
Accuracy Code Adjustment:	50	
Other Adjustment:	-49	**see note 2**
Rounding Adjustment:	3	
Minimum Descent Altitude / Decision Height:	1100	

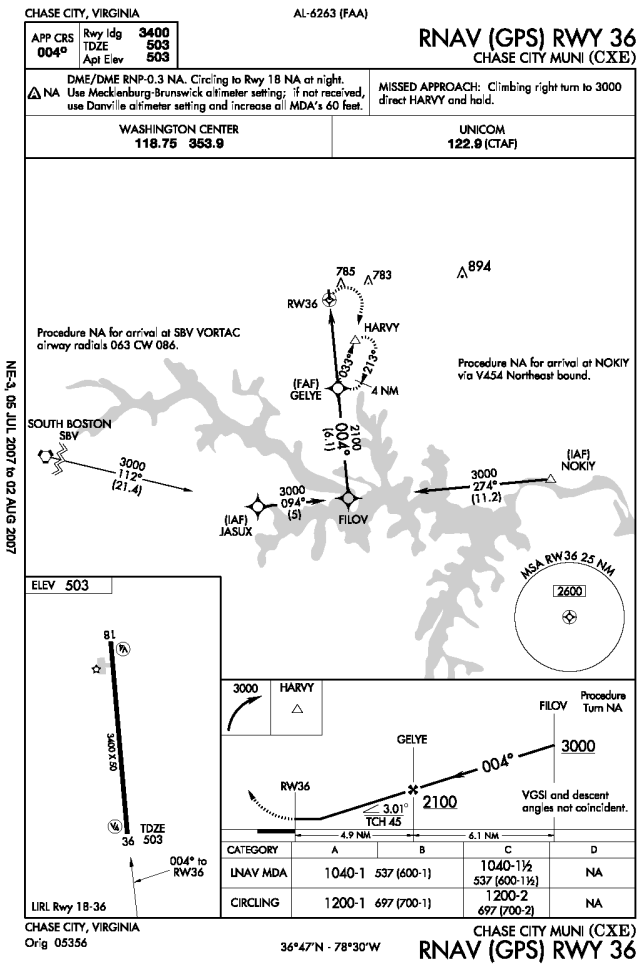
Note 1: Tower (47-1648)

Note 2: secondary area adjustment

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	1 SM	**KNOWN DEFICIENCIES**
	REQUIRED	
TERPS Paragraph 251	20:1 Clear	Yes
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	Yes
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	Yes
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Overview



RNAV (GPS) RWY 36 - LNAV

FAA PROCEDURE DATA		
Critical Obstacle:	579	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:	61	
Accuracy Code Adjustment:		
Other Adjustment:	133	**see note 2**
Rounding Adjustment:	17	
Minimum Descent Altitude / Decision Height:	1040	

Note 1: 50' Tree

Note 2: missed approach segment

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM REQUIRED	KNOWN DEFICIENCIES
TERPS Paragraph 251	20:1 Clear	Yes
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	Yes
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	Yes
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Recommendations

RNAV (GPS) RWY 18		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Altimeter Source Install AWOS-A and request FAA re-evaluation of remote altimeter setting source penalty. See Overall Recommendations.	Minimum Descent Altitude (MDA) may be reduced by 60 feet by eliminating the remote altimeter setting source (RASS) adjustment.	$25,000 (duplicate)
Procedure Review (Approach Category) Request deletion of Approach Category C minimums from the procedure.	Better reflects capabilities of airport infrastructure and design standards.	No equipment cost

RNAV (GPS) RWY 36		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Altimeter Source Install AWOS-A and request FAA re-evaluation of remote altimeter setting source penalty. See Overall Recommendations.	Minimum Descent Altitude (MDA) may be reduced by 60 feet by eliminating the remote altimeter setting source (RASS) adjustment.	$25,000 (duplicate)
Procedure Review (Approach Category) Request deletion of Approach Category C minimums from the procedure.	Better reflects capabilities of airport infrastructure and design standards.	No equipment cost

Chesapeake Regional (CPK)

Norfolk, Virginia

AIRPORT INFORMATION	
ROLE / CLASSIFICATION INFORMATION	
VATSP Classfication (2008):	Reliever
NPIAS Role (2008):	General Aviation
Study Classification:	Reliever

ACTIVITY INFORMATION	
Based Aircraft (2007):	122
Annual Operations (2020):	39963
Annual Enplanements (2020):	n/a
DEVELOPMENT INFORMATION (2008)	
Critical Airport Reference Code (Existing):	B-II
Critical Airport Reference Code (Proposed):	C-II
Airport Layout Plan (Original):	February, 2003
Airport Layout Plan (Revision):	n/a

Proposed Development (from ALD):

- Upgrade to C-II
- Install ODALS (RWY 23)
- Increase runway strength to 60,000# dual

AERONAUTICAL SURVEY INFORMATION

Runway End	Survey Type	Survey Date
all	Photoslope	2001
23	ANA-LPV	underway

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS	
Available Weather Reporting:	AWOS-III (PT)
Common Traffic Advisory Frequency:	123.05
Clearance Delivery:	GCO

Nearby Navigational Aids:

PORTSMOUTH	NDB	241	PVG	149°/ 9.1 NM TO FIELD
NORFOLK	VORTAC	116.9	ORF	210°/ 14.8 NM TO FIELD
ELIZABETH CITY	VOR/DME	112.5	ECG	351°/ 25.5 NM TO FIELD
CHESI	NDB	233	EY	046°/ 4.9 NM TO FIELD

Chesapeake Regional (CPK)

Norfolk, Virginia

Instrument Approach Procedure Summary

Minimums listed are Category B

EXISTING PROCEDURES		
RUNWAY 23		
VOR/DME RWY 23	480 - 1 (460)	Orig A
RUNWAY 5		
ILS RWY 5 - ILS	220 - 1/2 (200)	Orig
ILS RWY 5 - LOC	380 - 1/2 (360)	Orig
RNAV (GPS) RWY 5 - LNAV	420 - 1 (400)	Orig

PROCEDURES PROPOSED AS PART OF STUDY
RNAV (GPS) RWY 23 - LNAV
RNAV (GPS) RWY 23 - LPV
RNAV (GPS) RWY 5 - LPV

VISIBILITY CHANGES PROPOSED AS PART OF STUDY	
RUNWAY 23:	1 SM to 3/4 SM (also recommended on ALD)

REVIEWER COMMENTS

Although an ODALS is proposed on the ALD, the Study recommends installation of a MALS. The Study recommends a reduction in landing visibility minimums. Additional information regarding the estimated impacts and costs associated with the visibility changes is included in Appendix E. The Airport Sponsor completed the requested informational survey.

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 5 23 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	B-II	C-II
Runway Dimensions (Length x Width in ft):	5500 x 100	5500 x 100
Runway to Taxiway Separation (feet):	400	400
Runway Lighting:	HIRL	HIRL
RUNWAY 5		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	1000 x 1750 x 2500	1000 x 1750 x 2500
Runway Markings:	Precision	Precision
Available Visual Approach Aids:	PAPI	PAPI; ODALS
RUNWAY 23		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	1000 x 1510 x 1700	1000 x 1510 x 1700
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	PAPI; REILs	PAPI; REIL

Chesapeake Regional (CPK)

Norfolk, Virginia

System Benchmarks

Reliever			
Best Approach (Primary Runway End)			
BENCHMARK		**RUNWAY 5**	
Approach:	ILS CAT I	☑ meets	ILS RWY 5 - ILS
Ceiling:	200 AGL	☑ meets	
Visibility:	1/2 statute mile	☑ meets	
Approach:	LPV	☐ meets	RNAV (GPS) RWY 5 - LNAV
Ceiling:	200 AGL	☐ meets	
Visibility:	1/2 statute mile	☐ meets	
Equipment:	MALSR, HIRLs, PAPI	☑ meets	
Secondary Approach (Different Runway End)			
BENCHMARK		**RUNWAY 23**	
Approach:	Ground-based	☑ meets	VOR/DME RWY 23
Ceiling:	400 AGL	☐ meets	
Visibility:	3/4 staute mile	☐ meets	
Approach:	LPV	☐ meets	n/a (no satellite-based approach available)
Ceiling:	250 AGL	☐ meets	
Visibility:	3/4 statute mile	☐ meets	
Equipment:	MALS, HIRLs, PAPI	☐ meets	existing HIRLs, PAPI

Additional Requirements			
Weather:	on-field, 24/7, data-linked	☑ meets	
Access to ATC Clearance:	RTR	☐ meets	
ADS-B Coverage:	On ground	☐ meets	

Overall Recommendations

GENERAL		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Weather Reporting Upgrade existing AWOS-III to include freezing rain sensor.	Improves information available to pilot.	$50,000
Communications Upgrade existing Ground Communication Outlet (GCO) to a Remote Transmitter / Receiver (RTR) directly with Norfolk Approach.	Improves clearance delivery process. Provides direct communication with approach control. Used by aircraft on ground for obtaining or canceling IFR clearances.	$40,000
Communications Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	Improves pilot/controller communications and clearance delivery process.	Less than $5,000
Data link Provide ADS-B coverage while on the ground.	Provides traffic surveillance, terrain avoidance, weather data, etc. Crucial component for Next Generation Air Transportation System.	$100,000
Local Area Augmentation System (LAAS) Provide LAAS coverage to augment existing global positioning system.	Provides enhanced signal accuracy.	Unknown

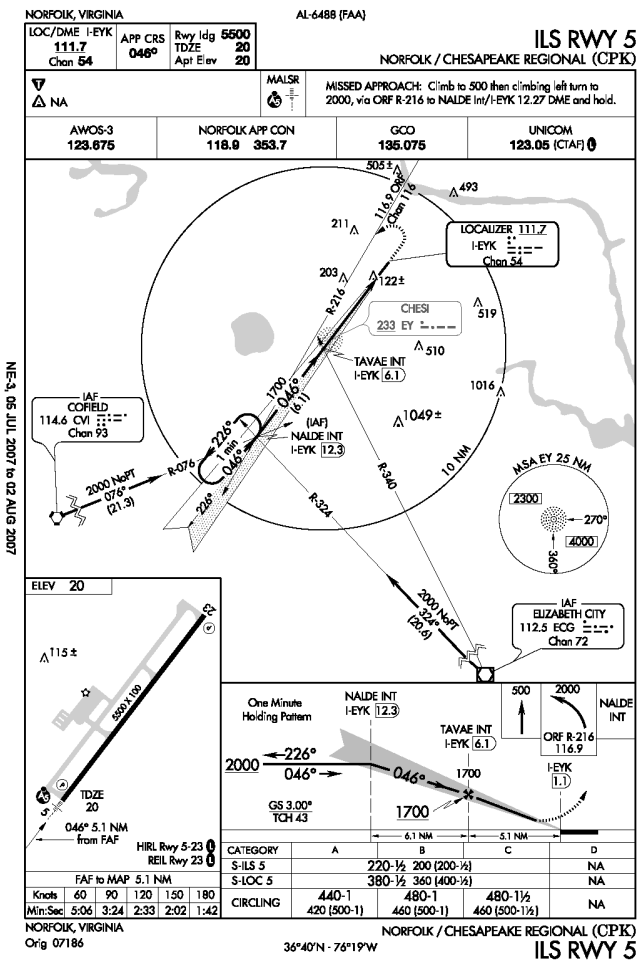
RUNWAY 5 23		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Airfield Lighting Control Change control sequence and/or facility directory note for HIRLs to be preset on low intensity with higher intensity activated on CTAF.	Provides visibilty of landing environment during night and adverse weather conditions even during times of aircraft equipment failure or pilot control system malfunction.	Less than $10,000

Overall Recommendations

RUNWAY 5		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions.	Standards.	Varies
Aeronautical Survey Request / complete aeronautical survey to enable development of LPV approach to Runway 5.	Provides survey data for instrument approach procedures.	$50,000
New Procedure Request development of RNAV (GPS) RWY 5 Approach with LPV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost

RUNWAY 23		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions.	Standards.	Varies
Approach Lighting System Install MALS for Runway 23.	Improves pilot's ability to detect the landing environment.	$400,000
Visibility Minimum Upon installation of approach lighting system, request procedure(s) be updated to 3/4 statute mile visibility.	Lower landing visibility minimum.	$100,000
Aeronautical Survey Request / complete aeronautical survey to enable development of LNAV and LPV approaches to Runway 23.	Provides survey data for instrument approach procedures.	Underway
New Procedure Request development of RNAV (GPS) RWY 23 Approach with LPV and LNAV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost

Procedure Overview



ILS RWY 5 - ILS

FAA PROCEDURE DATA	
Critical Obstacle:	**see note 1**
Required Obstacle Clearance:	
Remote Altimeter Adjustment:	
Accuracy Code Adjustment:	
Other Adjustment:	**see note 2**
Rounding Adjustment:	
Minimum Descent Altitude / Decision Height:	220

Note 1: ASC

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

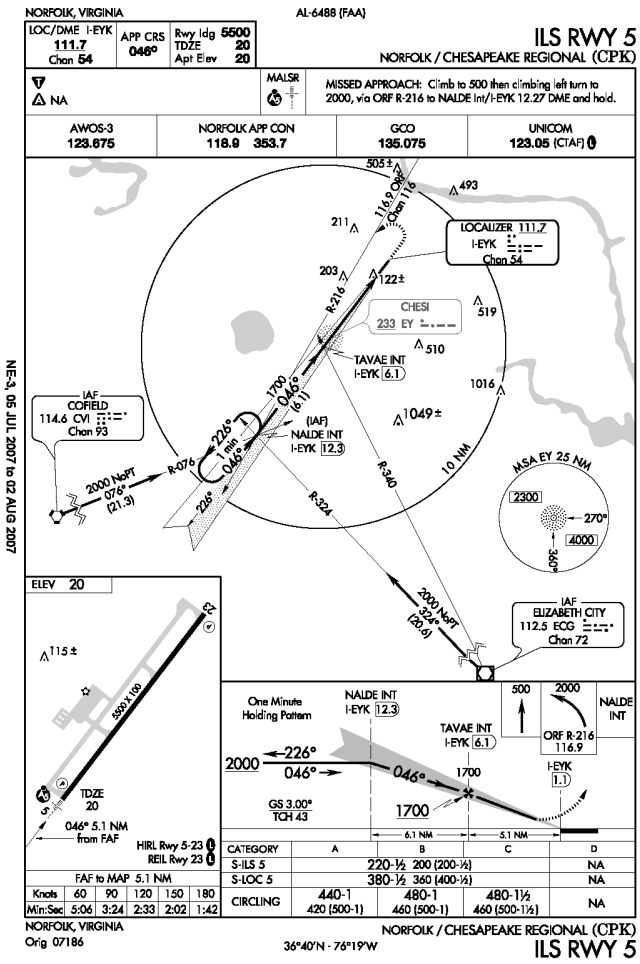
TABLE A16-1A - PRECISION INSTRUMENT APPROACH REQUIREMENTS

	<3/4 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	34:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	4,200 ft (Paved)	None
Runway Markings	Precision	None
Holding Position Signs and Markings	Precision	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	MALSR, SSALR, or ALSF	None
Runway Design Standards	<3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 9, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Chesapeake Regional (CPK)

Norfolk, Virginia

Procedure Overview



ILS RWY 5 - LOC

FAA PROCEDURE DATA		
Critical Obstacle:	122	see note 1
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		see note 2
Rounding Adjustment:	8	
Minimum Descent Altitude / Decision Height:	380	

Note 1: 105' Tree

Note 2:

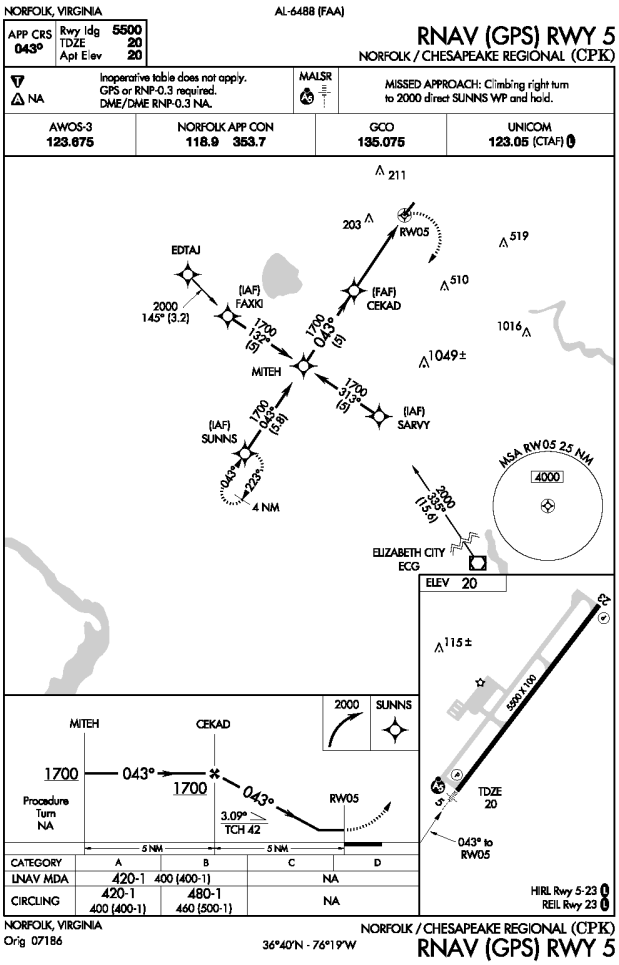
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	<3/4 SM REQUIRED	KNOWN DEFICIENCIES
TERPS Paragraph 251	34:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	4,200 ft (Paved)	None
Runway Markings	Precision	None
Holding Position Signs and Markings	Precision	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	MALSR, SSALR, or ALSF Required	None
Runway Design Standards	<3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 9, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Procedure Overview



RNAV (GPS) RWY 5 - LNAV

FAA PROCEDURE DATA		
Critical Obstacle:	120	see note 1
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:	50	
Other Adjustment:		see note 2
Rounding Adjustment:	0	
Minimum Descent Altitude / Decision Height:	420	

Note 1: 100' Tree

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

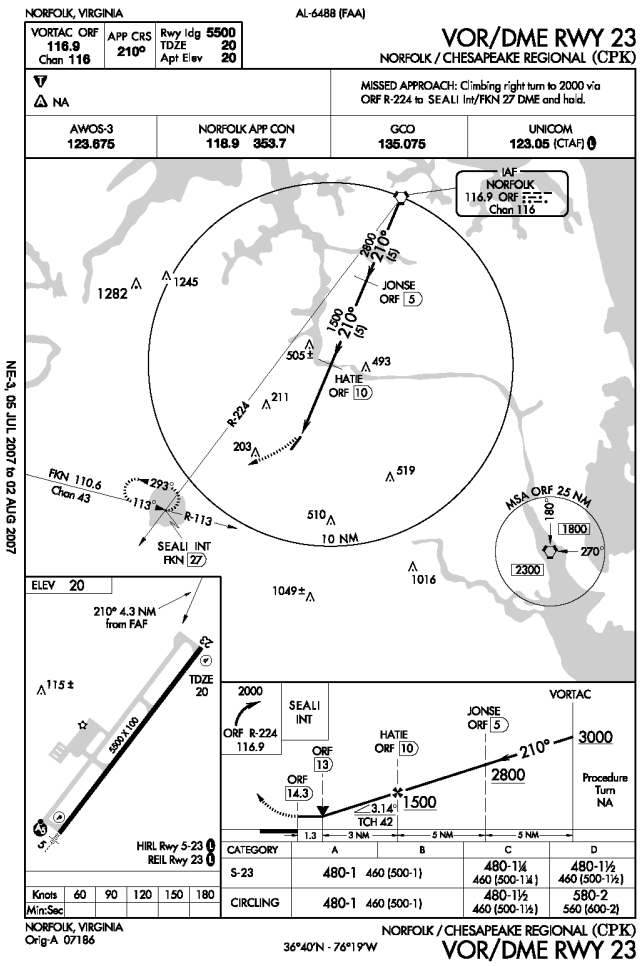
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM REQUIRED	KNOWN DEFICIENCIES
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	None
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Chesapeake Regional (CPK)

Norfolk, Virginia

Procedure Overview



VOR/DME RWY 23

FAA PROCEDURE DATA		
Critical Obstacle:	170	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:	50	
Other Adjustment:		**see note 2**
Rounding Adjustment:	10	
Minimum Descent Altitude / Decision Height:	480	

Note 1: TWR (47-1498)

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	1 SM	**KNOWN DEFICIENCIES**
	REQUIRED	
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Recommendations

ILS RWY 5		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Procedure Review (Approach Category) Request addition of Approach Category D minimums to the procedure.	Improves accessibility of the airport.	No equipment cost

RNAV (GPS) RWY 5		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Procedure Review (Approach Category) Request addition of Approach Category C and D minimums to the procedure.	Improves accessibility of the airport.	No equipment cost

VOR / DME RWY 23		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Approach Lighting System Install MALS for Runway 23. See Overall Recommendations.	Lowers landing visibility minimum to as low as 3/4 statute mile.	$400,000 (duplicate)

Chesterfield County (FCI)

Richmond, Virginia

AIRPORT INFORMATION	
ROLE / CLASSIFICATION INFORMATION	
VATSP Classfication (2008):	Reliever
NPIAS Role (2008):	Reliever
Study Classification:	Reliever

ACTIVITY INFORMATION	
Based Aircraft (2007):	138
Annual Operations (2020):	66689
Annual Enplanements (2020):	n/a

DEVELOPMENT INFORMATION (2008)	
Critical Airport Reference Code (Existing):	C-II
Critical Airport Reference Code (Proposed):	C-II
Airport Layout Plan (Original):	January, 2006
Airport Layout Plan (Revision):	n/a

Proposed Development (from ALD):
- Install ODALS (RWY 15)
- New Runway 10-28 (3500 x 75)

AERONAUTICAL SURVEY INFORMATION

Runway End	Survey Type	Survey Date
all	Photoslope	2001
all		incl. in Study

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS

Available Weather Reporting:	AWOS-III
Common Traffic Advisory Frequency:	123.05
Clearance Delivery:	RTR

Nearby Navigational Aids:

RICHMOND	VORTAC	114.1	RIC	248°/ 11.3 NM TO FIELD
HOPEWELL	VORTAC	112	HPW	289°/ 20.1 NM TO FIELD
FLAT ROCK	VORTAC	113.3	FAK	123°/ 16.2 NM TO FIELD

Chesterfield County (FCI)

Richmond, Virginia

Instrument Approach Procedure Summary

Minimums listed are Category B

EXISTING PROCEDURES		
RUNWAY 15		
RNAV (GPS) RWY 15 - LNAV	680 - 1 (443)	Orig
RUNWAY 33		
ILS OR LOC RWY 33 - ILS	418 - 1/2 (200)	Amdt 2
ILS OR LOC RWY 33 - LOC	520 - 1/2 (302)	Amdt 2
RNAV (GPS) RWY 33 - LNAV	660 - 1/2 (442)	Orig
RNAV (GPS) RWY 33 - LPV	470 - 1/2 (252)	Orig
RNAV (GPS) RWY 33 - VNAV	520 - 1/2 (302)	Orig

PROCEDURES PROPOSED AS PART OF STUDY
RNAV (GPS) RWY 15 - LPV
VOR/DME RWY 15 or - A

VISIBILITY CHANGES PROPOSED AS PART OF STUDY	
RUNWAY 15:	1 SM to 3/4 SM

REVIEWER COMMENTS

As a reliever airport, the Study recommends a ground-based approach and a vertically-guided approach be developed for Runway 15. Approach lights are also recommended for Runway 15. The Study recommends a reduction in landing visibility minimums. Additional information regarding the estimated impacts and costs associated with the visibility changes is included in Appendix E. The Airport Sponsor completed the requested informational survey.

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 10 28 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	n/a	B-II
Runway Dimensions (Length x Width in ft):	n/a	3500 x 75
Runway to Taxiway Separation (feet):	n/a	240
Runway Lighting:	n/a	MIRL
RUNWAY 10		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	n/a	250 x 450 x 1000
Runway Markings:	n/a	Visual
Available Visual Approach Aids:	n/a	PAPI; REILs
RUNWAY 28		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	n/a	250 x 450 x 1000
Runway Markings:	n/a	Visual
Available Visual Approach Aids:	n/a	PAPI; REILs
RUNWAY 15 33 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	C-II	C-II
Runway Dimensions (Length x Width in ft):	5500 x 100	5500 x 100
Runway to Taxiway Separation (feet):	375	375
Runway Lighting:	HIRL	HIRL
RUNWAY 15		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	1000 x 1510 x 1700	1000 x 1510 x 1700
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	PAPI; REILs	PAPI; ODALs
RUNWAY 33		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	1000 x 1750 x 2500	1000 x 1750 x 2500
Runway Markings:	Precision	Precision
Available Visual Approach Aids:	PAPI; MALSR	PAPI; MALSR

Chesterfield County (FCI)

Richmond, Virginia

System Benchmarks

Reliever			
Best Approach (Primary Runway End)			
BENCHMARK		**RUNWAY 33**	
Approach:	ILS CAT I	☑ meets	ILS OR LOC RWY 33 - ILS
Ceiling:	200 AGL	☑ meets	
Visibility:	1/2 statute mile	☑ meets	
Approach:	LPV	☑ meets	RNAV (GPS) RWY 33 - LPV
Ceiling:	200 AGL	☐ meets	
Visibility:	1/2 statute mile	☑ meets	
Equipment:	MALSR, HIRLs, PAPI	☑ meets	
Secondary Approach (Different Runway End)			
BENCHMARK		**RUNWAY 15**	
Approach:	Ground-based	☐ meets	n/a (no ground-based approach available)
Ceiling:	400 AGL	☐ meets	
Visibility:	3/4 staute mile	☐ meets	
Approach:	LPV	☐ meets	RNAV (GPS) RWY 15 - LNAV
Ceiling:	250 AGL	☐ meets	
Visibility:	3/4 statute mile	☐ meets	
Equipment:	MALS, HIRLs, PAPI	☐ meets	existing HIRLs, PAPI

Additional Requirements			
Weather:	on-field, 24/7, data-linked	☐ meets	
Access to ATC Clearance:	RTR	☑ meets	
ADS-B Coverage:	On ground	☐ meets	

Overall Recommendations

GENERAL		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Weather Reporting Connect existing AWOS-III to NADIN system.	Improve availability / accessibility of weather information.	$5,000
Weather Reporting Upgrade existing AWOS-III to include present weather, lightning and freezing rain sensor.	Improves information available to pilot.	$60,000
Communications Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	Improves pilot/controller communications and clearance delivery process.	Less than $5,000
Data link Provide ADS-B coverage while on the ground.	Provides traffic surveillance, terrain avoidance, weather data, etc. Crucial component for Next Generation Air Transportation System.	$100,000
Local Area Augmentation System (LAAS) Provide LAAS coverage to augment existing global positioning system.	Provides enhanced signal accuracy.	Unknown

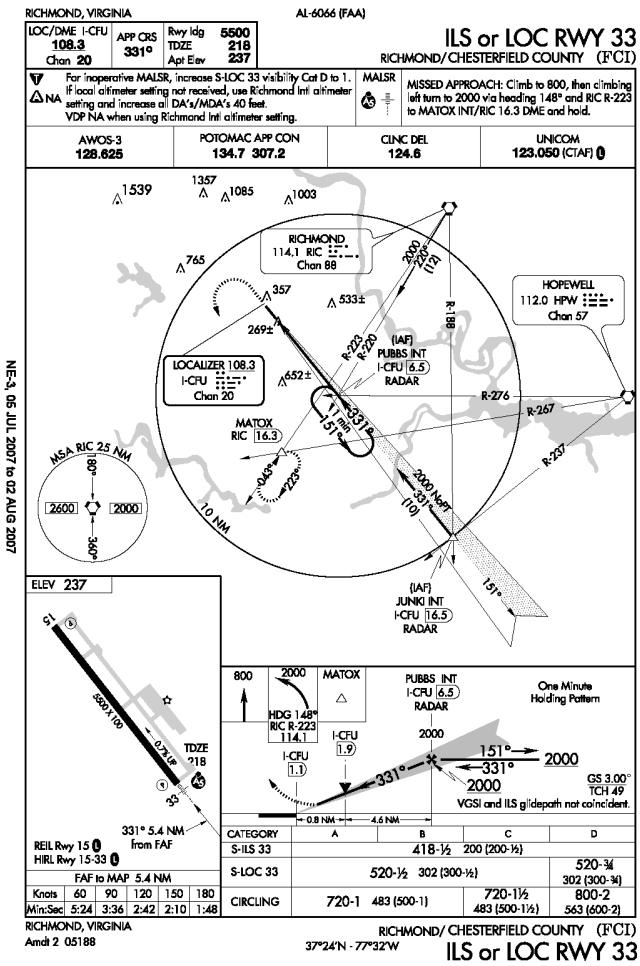
Overall Recommendations

RUNWAY 15		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Runway End Identifier Lights Repair REILs and eliminate AFD note "Runway 15 REILS OTS indef".	Improves pilot's ability to detect the landing environment.	$50,000
Approach Lighting System Install MALS for Runway 15.	Improves pilot's ability to detect the landing environment.	$450,000
Visibility Minimum Upon installation of approach lighting system and subsequent acceptance of visibility credit, different design standards apply (less than 1 mile).	Lower landing visibility minimum.	No equipment cost
New Procedure Request development of VOR/DME RWY 15 (FAK VORTAC) or VOR/DME-A (RIC VORTAC) approach.	Improve all-weather capability of the runway and airport.	No equipment cost
Aeronautical Survey Request / complete aeronautical survey to enable development of LPV approach to Runway 15.	Provides survey data for instrument approach procedures.	Underway as part of Study
New Procedure Request development of RNAV (GPS) RWY 15 Approach with LPV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost
Obstruction Removal Remove close-in obstructions (pole).	Standards.	Varies

Chesterfield County (FCI)

Richmond, Virginia

Procedure Overview



ILS OR LOC RWY 33 - ILS

FAA PROCEDURE DATA	
Critical Obstacle:	**see note 1**
Required Obstacle Clearance:	
Remote Altimeter Adjustment:	
Accuracy Code Adjustment:	
Other Adjustment:	**see note 2**
Rounding Adjustment:	
Minimum Descent Altitude / Decision Height:	418

Note 1: ASC

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

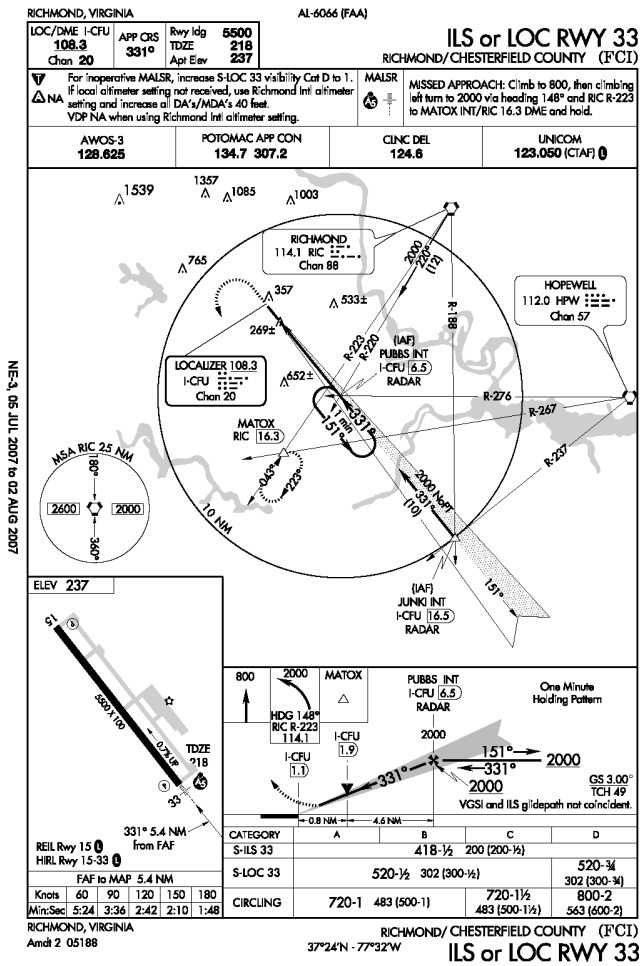
TABLE A16-1A - PRECISION INSTRUMENT APPROACH REQUIREMENTS

	<3/4 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	34:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	4,200 ft (Paved)	None
Runway Markings	Precision	None
Holding Position Signs and Markings	Precision	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	MALSR, SSALR, or ALSF	None
Runway Design Standards	<3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 9, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Chesterfield County (FCI)

Richmond, Virginia

Procedure Overview



ILS OR LOC RWY 33 - LOC

FAA PROCEDURE DATA		
Critical Obstacle:	269	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	1	
Minimum Descent Altitude / Decision Height:	520	

Note 1: 60' Tree

Note 2:

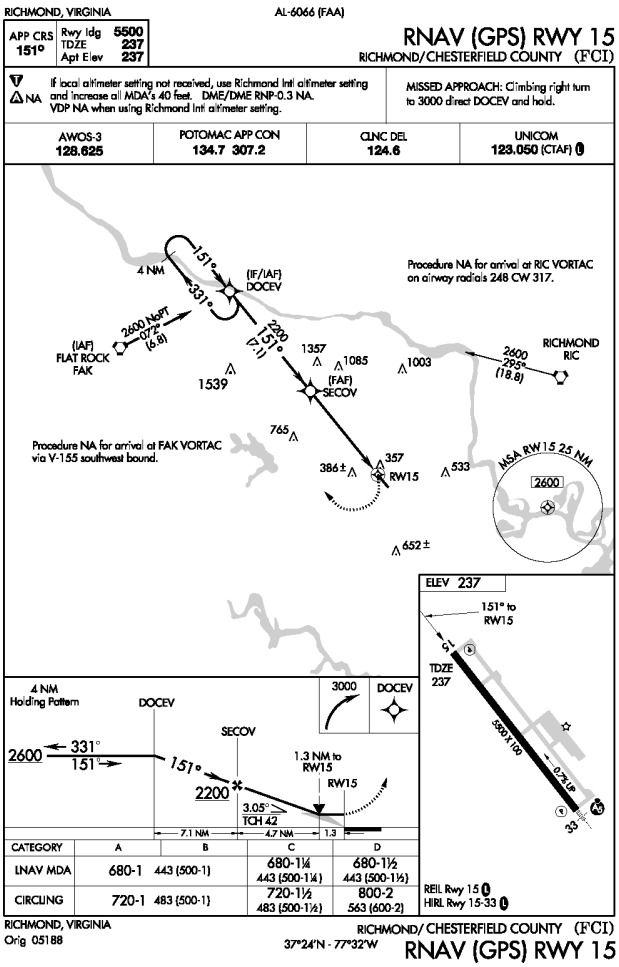
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	<3/4 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	34:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	4,200 ft (Paved)	None
Runway Markings	Precision	None
Holding Position Signs and Markings	Precision	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	MALSR, SSALR, or ALSF Required	None
Runway Design Standards	<3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 9, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Procedure Overview



RNAV (GPS) RWY 15 - LNAV

FAA PROCEDURE DATA		
Critical Obstacle:	380	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:	50	
Other Adjustment:		**see note 2**
Rounding Adjustment:	0	
Minimum Descent Altitude / Decision Height:	680	

Note 1: Tower (47-0421)

Note 2:

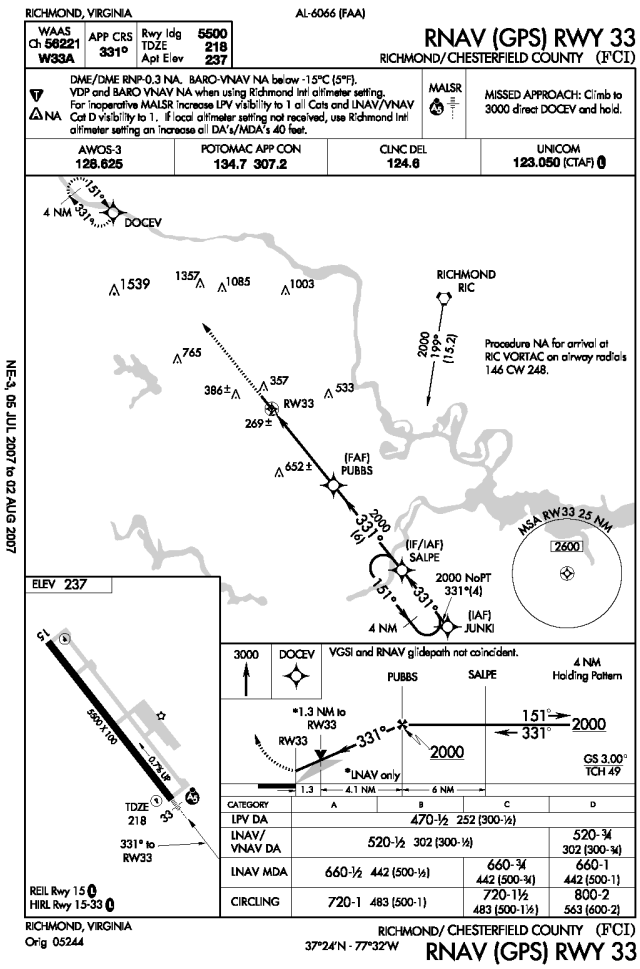
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Overview



RNAV (GPS) RWY 33 - LPV

FAA PROCEDURE DATA	
Critical Obstacle:	**see note 1**
Required Obstacle Clearance:	
Remote Altimeter Adjustment:	
Accuracy Code Adjustment:	
Other Adjustment:	**see note 2**
Rounding Adjustment:	
Minimum Descent Altitude / Decision Height:	470

Note 1: ASC

Note 2:

Note 3:

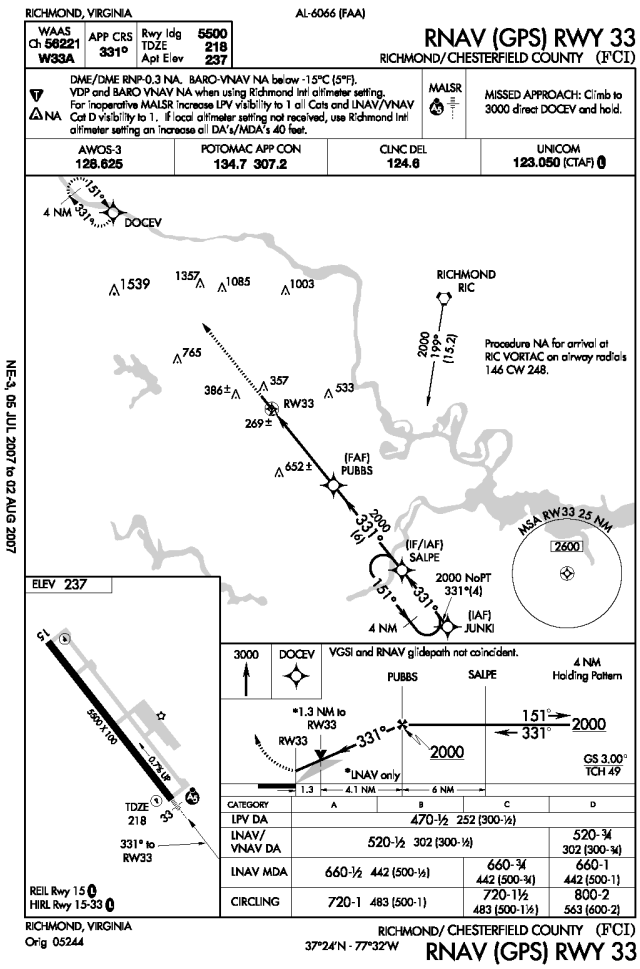
NE-3, 05 JUL 2007 to 02 AUG 2007

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1B - APPROACH PROCEDURE WITH VERTICAL GUIDANCE APPROACH REQUIREMENTS

	<3/4 SM	KNOWN DEFICIENCIES
	REQUIRED	
TERPS Paragraph 251	34:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	4,200 ft (Paved)	None
Runway Markings	Precision	None
Holding Position Signs and Markings	Precision	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	Required	None
Runway Design Standards	<3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 4 and 9, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Procedure Overview



RNAV (GPS) RWY 33 - VNAV

FAA PROCEDURE DATA		
Critical Obstacle:	269	**see note 1**
Required Obstacle Clearance:		
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:		
Minimum Descent Altitude / Decision Height:	520	

Note 1: 60' Tree

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

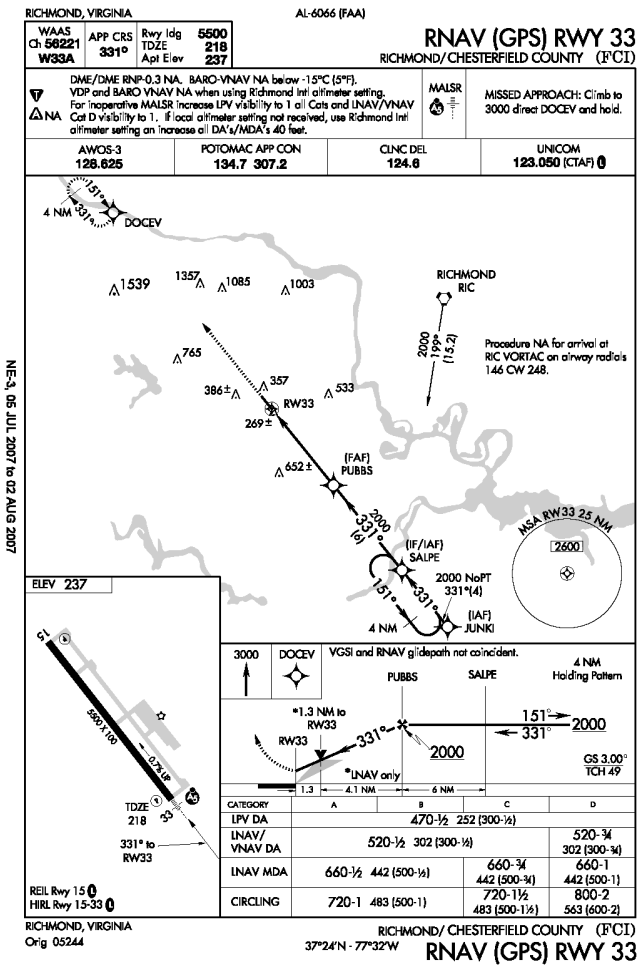
TABLE A16-1B - APPROACH PROCEDURE WITH VERTICAL GUIDANCE APPROACH REQUIREMENTS

	<3/4 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	34:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	4,200 ft (Paved)	None
Runway Markings	Precision	None
Holding Position Signs and Markings	Precision	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	Required	None
Runway Design Standards	<3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 4 and 9, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Chesterfield County (FCI)

Richmond, Virginia

Procedure Overview



RNAV (GPS) RWY 33 - LNAV

FAA PROCEDURE DATA		
Critical Obstacle:	350	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:	50	
Other Adjustment:		**see note 2**
Rounding Adjustment:	10	
Minimum Descent Altitude / Decision Height:	660	

Note 1: Tower((47-0682)

Note 2:

Note 3:

NE-3, 05 JUL 2007 to 02 AUG 2007

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	<3/4 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	34:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	4,200 ft (Paved)	None
Runway Markings	Precision	None
Holding Position Signs and Markings	Precision	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	MALSR, SSALR, or ALSF Required	None
Runway Design Standards	<3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 9, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Procedure Recommendations

ILS OR LOC RWY 33		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Critical Obstacle Field verify critical obstacle for localizer approach to change accuracy code from "D" to "A" or 50 feet to 3 feet.	Minimum Descent Altitude (MDA) for localizer approach may be reduced by 40 to 60 feet.	Less than $10,000

RNAV (GPS) RWY 15		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Visibility Minimum Upon installation of approach lighting system, request procedure be updated to 3/4 statute mile visibility.	Lower landing visibility minimum.	See Overall Recommendations

RNAV (GPS) RWY 33		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a

Crewe Municipal (W81)

Crewe, Virginia

AIRPORT INFORMATION	
ROLE / CLASSIFICATION INFORMATION	
VATSP Classfication (2008):	Local Service
NPIAS Role (2008):	n/a
Study Classification:	Local Service

ACTIVITY INFORMATION	
Based Aircraft (2007):	14
Annual Operations (2020):	4999
Annual Enplanements (2020):	n/a

DEVELOPMENT INFORMATION (2008)	
Critical Airport Reference Code (Existing):	B-I
Critical Airport Reference Code (Proposed):	B-I
Airport Layout Plan (Original):	June, 1992
Airport Layout Plan (Revision):	July, 2003

Proposed Development (from ALD):

- Extend runway (700')

AERONAUTICAL SURVEY INFORMATION

Runway End	Survey Type	Survey Date
all	Photoslope	2006

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS	
Available Weather Reporting:	None
Common Traffic Advisory Frequency:	122.8
Clearance Delivery:	Phone

Nearby Navigational Aids:

LAWRENCEVILLE	VORTAC	112.9	LVL	345°/ 23.7 NM TO FIELD
FLAT ROCK	VORTAC	113.3	FAK	218°/ 24.5 NM TO FIELD
BLACKSTONE	NDB	326	BKT	330°/ 4.1 NM TO FIELD

Crewe Municipal (W81)

Crewe, Virginia

REVIEWER COMMENTS

No published instrument approach procedures. The Airport Sponsor completed the requested informational survey.

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 15 33 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	B-I	B-I
Runway Dimensions (Length x Width in ft):	3300 x 60	4000 x 60
Runway to Taxiway Separation (feet):	none	none
Runway Lighting:	LIRL	MIRL
RUNWAY 15		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	250 x 450 x 1000	250 x 450 x 1000
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	APAP	APAP
RUNWAY 33		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	250 x 450 x 1000	250 x 450 x 1000
Runway Markings:	Visual	Visual
Available Visual Approach Aids:	APAP	APAP

Culpeper Regional (CJR)

Culpeper, Virginia

AIRPORT INFORMATION	
ROLE / CLASSIFICATION INFORMATION	
VATSP Classfication (2008):	General Aviation Regional
NPIAS Role (2008):	General Aviation
Study Classification:	General Aviation Regional (3/4 mile visibility)

ACTIVITY INFORMATION	
Based Aircraft (2007):	129
Annual Operations (2020):	83479
Annual Enplanements (2020):	n/a
DEVELOPMENT INFORMATION (2008)	
Critical Airport Reference Code (Existing):	B-II
Critical Airport Reference Code (Proposed):	B-II
Airport Layout Plan (Original):	December, 2002
Airport Layout Plan (Revision):	n/a
Proposed Development (from ALD):	

AERONAUTICAL SURVEY INFORMATION

Runway End	Survey Type	Survey Date
all	Photoslope	2006
22	ANA-LPV	2006
4	ANA-LPV	2006

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS	
Available Weather Reporting:	AWOS-III (PT)
Common Traffic Advisory Frequency:	123.075
Clearance Delivery:	GCO

Nearby Navigational Aids:

NAILR	NDB	351	MSQ	037°/ 4.8 NM TO FIELD
LINDEN	VORTAC	114.3	LDN	147°/ 25.5 NM TO FIELD
CASANOVA	VORTAC	116.3	CSN	184°/ 6.9 NM TO FIELD
BROOKE	VORTAC	114.5	BRV	304°/ 26.4 NM TO FIELD

Culpeper Regional (CJR)

Culpeper, Virginia

Instrument Approach Procedure Summary

Minimums listed are Category B

EXISTING PROCEDURES		
CIRCLING		
NDB OR GPS-B	980 - 1 (667)	Orig A
VOR OR GPS-A	980 - 1 (667)	Amdt 4B
RUNWAY 22		
VOR/DME RNAV OR GPS RWY 22	820 - 1 (507)	Amdt 1B
RUNWAY 4		
LOC RWY 4	700 - 1 (384)	Orig
NDB RWY 4	920 - 1 (604)	Orig

PROCEDURES PROPOSED AS PART OF STUDY
RNAV (GPS) RWY 22 - LNAV
RNAV (GPS) RWY 22 - LPV
RNAV (GPS) RWY 4 - LNAV
RNAV (GPS) RWY 4 - LPV

VISIBILITY CHANGES PROPOSED AS PART OF STUDY	
RUNWAY 4:	1 SM to 3/4 SM

REVIEWER COMMENTS

The Study recommends a reduction in visibility minimums from 1 mile to 3/4 mile. Additional information regarding the estimated impacts and costs associated with the visibility changes is included in Appendix E.

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 4 22 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	B-II	B-II
Runway Dimensions (Length x Width in ft):	5000 x 100	5000 x 100
Runway to Taxiway Separation (feet):	252	252
Runway Lighting:	MIRL	MIRL
RUNWAY 4		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 700 x 1000	500 x 700 x 1000
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	PAPI; REILs	PAPI; REILs
RUNWAY 22		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 700 x 1000	500 x 700 x 1000
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	PAPI; REILs	PAPI; REILs

Culpeper Regional (CJR)

Culpeper, Virginia

System Benchmarks

General Aviation Regional (3/4 mile visibility)			
Best Approach (Primary Runway End)			
BENCHMARK		**RUNWAY 4**	
Approach:	Ground-based	☑ meets	LOC RWY 4
Ceiling:	400 AGL	☑ meets	
Visibility:	3/4 statute mile	☐ meets	
Approach:	LPV	☐ meets	n/a (no satellite-based approach available)
Ceiling:	250 AGL	☐ meets	
Visibility:	3/4 statute mile	☐ meets	
Equipment:	MALS, HIRLs, PAPI	☐ meets	
Secondary Approach (Different Runway End)			
BENCHMARK		**RUNWAY 22**	
Approach:	Ground-based	☑ meets	VOR/DME RNAV OR GPS RWY 22
Ceiling:	400 AGL	☐ meets	
Visibility:	1 statute mile	☑ meets	
Approach:	LPV	☐ meets	n/a (no satellite-based approach available)
Ceiling:	250 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Equipment:	REILs, HIRLs, PAPI	☐ meets	

Additional Requirements			
Weather:	on-field, 24/7, data-linked	☑ meets	
Access to ATC Clearance:	RTR	☐ meets	
ADS-B Coverage:	On ground	☐ meets	

Overall Recommendations

GENERAL		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Weather Reporting Upgrade existing AWOS-III to include freezing rain sensor.	Improves information available to pilot.	$50,000
Communications Upgrade existing Ground Communication Outlet (GCO) to a Remote Transmitter / Receiver (RTR) directly with Potomac Approach.	Improves clearance delivery process. Provides direct communication with approach control. Used by aircraft on ground for obtaining or canceling IFR clearances.	$40,000
Communications Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	Improves pilot/controller communications and clearance delivery process.	Less than $5,000
Data link Provide ADS-B coverage while on the ground.	Provides traffic surveillance, terrain avoidance, weather data, etc. Crucial component for Next Generation Air Transportation System.	$100,000
Local Area Augmentation System (LAAS) Provide LAAS coverage to augment existing global positioning system.	Provides enhanced signal accuracy.	Unknown

RUNWAY 4 22		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Airfield Lighting Control Change control sequence and/or facility directory note for MIRLs to be preset on low intensity with higher intensity activated on CTAF.	Provides visibilty of landing environment during night and adverse weather conditions even during times of aircraft equipment failure or pilot control system malfunction.	Less than $10,000

Overall Recommendations

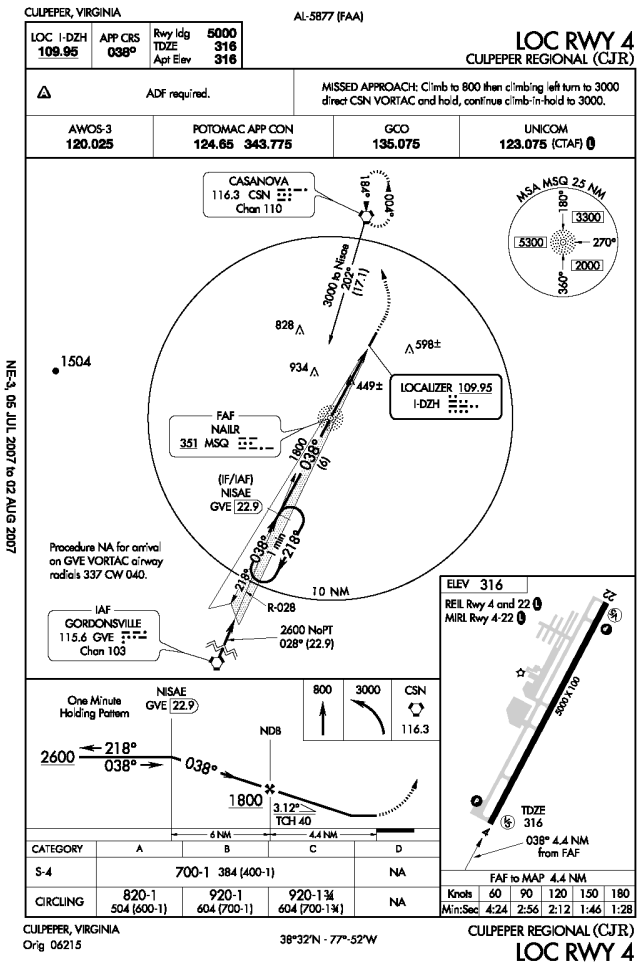
RUNWAY 4		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions (pole).	Standards.	Varies
Approach Lighting System Install MALSR or MALS for Runway 4.	Improves pilot's ability to detect the landing environment.	$800,000
Visibility Minimum Upon installation of approach lighting system and subsequent acceptance of visibility credit, different design standards apply (less than 1 mile).	Lower landing visibility minimum.	$2,100,000
Aeronautical Survey Request / complete aeronautical survey to enable development of LNAV and LPV approaches to Runway 4.	Provides survey data for instrument approach procedures.	Completed 2006
New Procedure Request development of RNAV (GPS) RWY 4 Approach with LPV and LNAV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost

RUNWAY 22		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions (fence).	Standards.	Varies
Aeronautical Survey Request / complete aeronautical survey to enable development of LNAV and LPV approaches to Runway 22.	Provides survey data for instrument approach procedures.	Completed 2006
New Procedure Request development of RNAV (GPS) RWY 22 Approach with LPV and LNAV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost

Culpeper Regional (CJR)

Culpeper, Virginia

Procedure Overview



LOC RWY 4

FAA PROCEDURE DATA		
Critical Obstacle:	449	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	1	
Minimum Descent Altitude / Decision Height:	700	

Note 1: 50' Tree 2C

Note 2:

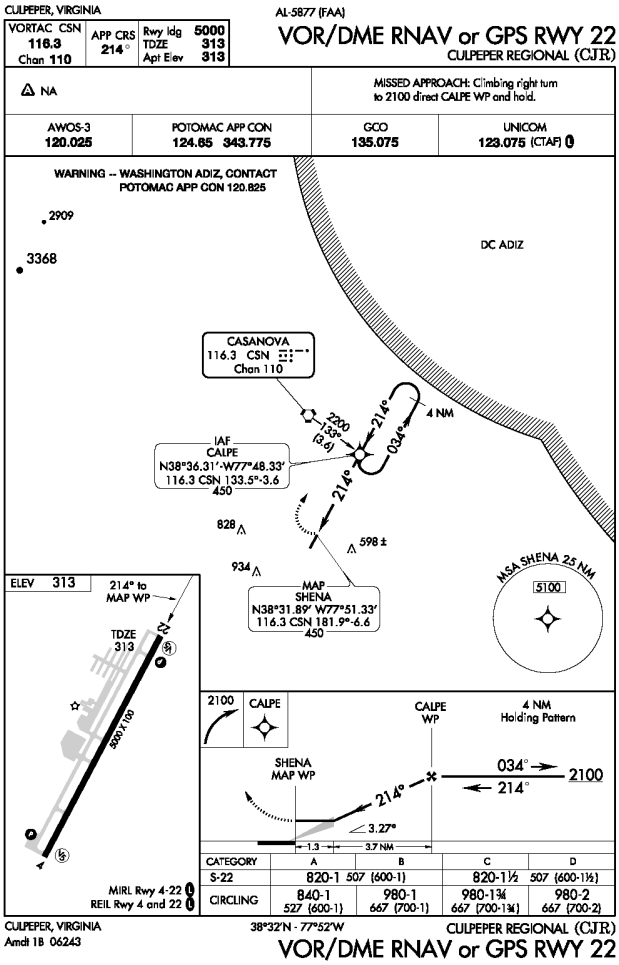
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Overview



VOR/DME RNAV OR GPS RWY 22

FAA PROCEDURE DATA		
Critical Obstacle:	589	**see note 1**
Required Obstacle Clearance:	223	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	8	
Minimum Descent Altitude / Decision Height:	820	

Note 1: 60 Tree 2C

Note 2:

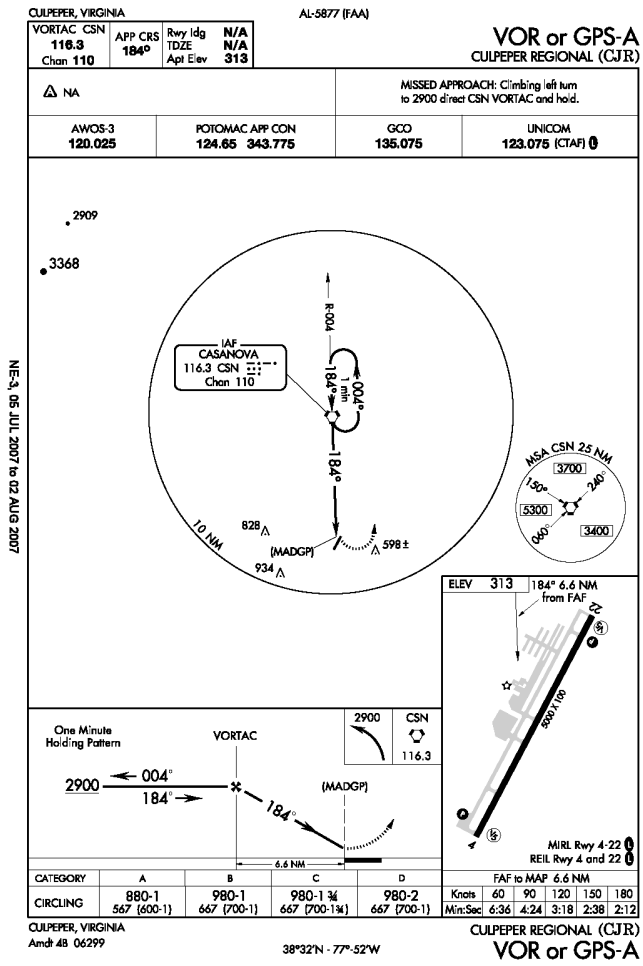
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Overview



VOR OR GPS-A

FAA PROCEDURE DATA		
Critical Obstacle:	619	**see note 1**
Required Obstacle Clearance:	300	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:	50	
Other Adjustment:		**see note 2**
Rounding Adjustment:	11	
Minimum Descent Altitude / Decision Height:	980	

Note 1: 60' Tree

Note 2:

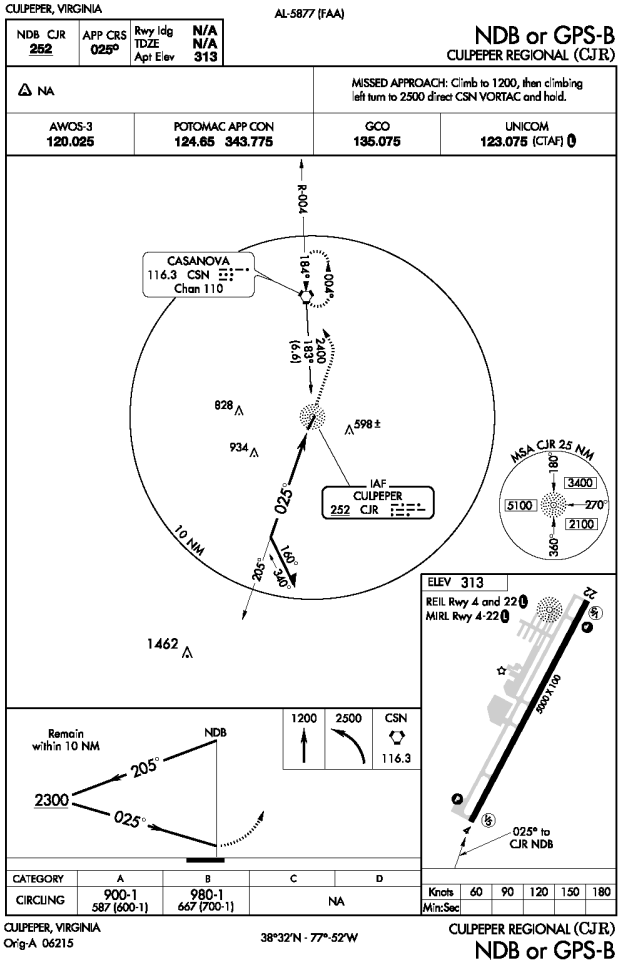
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	CIRCLING **REQUIRED**	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Recommended	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Visual (Basic)	None
Holding Position Signs and Markings	Visual (Basic)	None
Runway Edge Lights	MIRL / LIRL (for night minima only)	None
Parallel Taxiway	Recommended	None
Approach Lights	Not Required	Yes
Runway Design Standards	Not Required	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-2, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Culpeper Regional (CJR)

Culpeper, Virginia

Procedure Overview



NDB OR GPS-B

FAA PROCEDURE DATA		
Critical Obstacle:	619	**see note 1**
Required Obstacle Clearance:	300	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:	50	
Other Adjustment:		**see note 2**
Rounding Adjustment:	11	
Minimum Descent Altitude / Decision Height:	980	

Note 1: 60' Tree

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

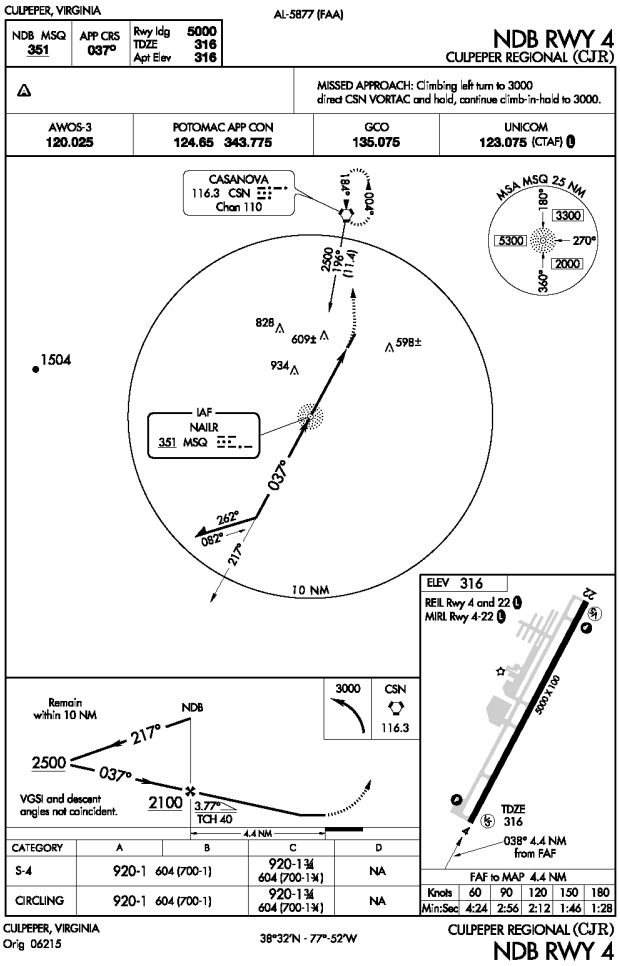
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	CIRCLING	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Recommended	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Visual (Basic)	None
Holding Position Signs and Markings	Visual (Basic)	None
Runway Edge Lights	MIRL / LIRL (for night minima only)	None
Parallel Taxiway	Recommended	None
Approach Lights	Not Required	Yes
Runway Design Standards	Not Required	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-2, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Culpeper Regional (CJR)

Culpeper, Virginia

Procedure Overview



NDB RWY 4

FAA PROCEDURE DATA		
Critical Obstacle:	609	**see note 1**
Required Obstacle Clearance:	300	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	11	
Minimum Descent Altitude / Decision Height:	920	

Note 1: 50' Tree 2C

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	1 SM	**KNOWN DEFICIENCIES**
	REQUIRED	
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Recommendations

LOC RWY 4		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Procedure Review Request procedure be modified to eliminate ADF requirement.	Procedure simplification and improved reliability.	No equipment cost
Marker Beacon Install an Outer Marker.	Improves pilot's situational awareness. Can be used to establish the final approach fix.	$50,000
Distance Measuring Equipment Install Distance Measuring Equipment (DME). Co-locate with the localizer.	Improves pilot's situational awareness. Preferred method to establish the final approach fix.	$100,000
Procedure Review (Approach Category) Request addition of Approach Category D minimums to the procedure.	Improves accessibility of the airport.	No equipment cost
Visibility Minimum Upon installation of approach lighting system, request procedure be updated to 3/4 statute mile visibility.	Lower landing visibility minimum.	See Overall Recommendations

VOR/DME RNAV OR GPS RWY 22		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a

Procedure Recommendations

VOR OR GPS A		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a

NDB or GPS B		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a

NDB RWY 4		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Visibility Minimum Upon installation of approach lighting system, request procedure be updated to 3/4 statute mile visibility.	Lower landing visibility minimum.	See Overall Recommendations

Danville Regional (DAN)

Danville, Virginia

AIRPORT INFORMATION	
ROLE / CLASSIFICATION INFORMATION	
VATSP Classfication (2008):	General Aviation Regional
NPIAS Role (2008):	General Aviation
Study Classification:	General Aviation Regional (1/2 mile visibility)

ACTIVITY INFORMATION	
Based Aircraft (2007):	44
Annual Operations (2020):	23083
Annual Enplanements (2020):	n/a
DEVELOPMENT INFORMATION (2008)	
Critical Airport Reference Code (Existing):	C-II
Critical Airport Reference Code (Proposed):	C-II
Airport Layout Plan (Original):	December, 2001
Airport Layout Plan (Revision):	n/a

Proposed Development (from ALD):
- Acquire property within RWY 20 RPZ

AERONAUTICAL SURVEY INFORMATION

Runway End	Survey Type	Survey Date
all	Photoslope	2006
31	BV	1999
13	BV	1999
20	C	1999
2	PIR	1999
all	OC-DAN 599	2001
20	ANA-LPV	underway

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS	
Available Weather Reporting:	ASOS
Common Traffic Advisory Frequency:	123.05
Clearance Delivery:	RTR

Nearby Navigational Aids:

SOUTH BOSTON	VORTAC	110.4	SBV	253°/ 16.7 NM TO FIELD
DANVILLE	VOR	113.1	DAN	AT FIELD

Danville Regional (DAN)

Danville, Virginia

Instrument Approach Procedure Summary

Minimums listed are Category B

EXISTING PROCEDURES		
RUNWAY 2		
ILS RWY 2 - ILS	759 - 1/2 (200)	Amdt 3
ILS RWY 2 - LOC	900 - 1/2 (341)	Amdt 3
VOR RWY 2	1060 - 3/4 (492)	Amdt 13
RUNWAY 20		
GPS RWY 20	1000 - 1 (432)	Orig A
VOR RWY 20	1000 - 1 (432)	Amdt 1

PROCEDURES PROPOSED AS PART OF STUDY
RNAV (GPS) RWY 13 - LNAV
RNAV (GPS) RWY 2 - LNAV
RNAV (GPS) RWY 2 - LPV
RNAV (GPS) RWY 20 - LPV
RNAV (GPS) RWY 31 - LNAV

VISIBILITY CHANGES PROPOSED AS PART OF STUDY	
none	

REVIEWER COMMENTS

none

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 13 31 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	B-II	B-II
Runway Dimensions (Length x Width in ft):	4020 x 100	4020 x 100
Runway to Taxiway Separation (feet):	300	300
Runway Lighting:	MIRL	MIRL
RUNWAY 13		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 700 x 1000	500 x 700 x 1000
Runway Markings:	Visual	Visual
Available Visual Approach Aids:	VASI; REILs	PAPI; REILs
RUNWAY 31		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 700 x 1000	500 x 700 x 1000
Runway Markings:	Visual	Visual
Available Visual Approach Aids:	VASI; REILs	PAPI; REILs
RUNWAY 2 20 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	C-II	C-II
Runway Dimensions (Length x Width in ft):	6500 x 150	6500 x 150
Runway to Taxiway Separation (feet):	400	400
Runway Lighting:	HIRL	HIRL
RUNWAY 2		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	1000 x 1750 x 2500	1000 x 1750 x 2500
Runway Markings:	Precision	Precision
Available Visual Approach Aids:	PAPI; MALSR	PAPI; MALSR
RUNWAY 20		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 1010 x 1700	500 x 1010 x 1700
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	PAPI; REILs	PAPI; REILs

Danville Regional (DAN)

Danville, Virginia

System Benchmarks

General Aviation Regional (1/2 mile visibility)			
Best Approach (Primary Runway End)			
BENCHMARK		**RUNWAY 2**	
Approach:	ILS CAT I	☑ meets	ILS RWY 2 - ILS
Ceiling:	200 AGL	☑ meets	
Visibility:	1/2 statue mile	☑ meets	
Approach:	LPV	☐ meets	n/a (no satellite-based approach available)
Ceiling:	200 AGL	☐ meets	
Visibility:	1/2 statute mile	☐ meets	
Equipment:	MALSR, HIRLs, PAPI	☑ meets	
Secondary Approach (Different Runway End)			
BENCHMARK		**RUNWAY 20**	
Approach:	Ground-based	☑ meets	VOR RWY 20
Ceiling:	400 AGL	☐ meets	
Visibility:	1 statute mile	☑ meets	
Approach:	LPV	☐ meets	GPS RWY 20
Ceiling:	250 AGL	☐ meets	
Visibility:	1 statute mile	☑ meets	
Equipment:	REILs, HIRLs, PAPI	☑ meets	
All Ends of Instrument Runways			
BENCHMARK		**RUNWAY 31**	
Approach:	none	☐ meets	n/a (no ground-based approach available)
Ceiling:		☐ meets	
Visibility:		☐ meets	
Approach:	LNAV	☐ meets	n/a (no satellite-based approach available)
Ceiling:	400 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Equipment:	REILs, MIRLs, PAPI	☑ meets	

Danville Regional (DAN)

Danville, Virginia

BENCHMARK		RUNWAY 13	
Approach:	none	☐ meets	n/a (no ground-based approach available)
Ceiling:		☐ meets	
Visibility:		☐ meets	
Approach:	LNAV	☐ meets	n/a (no satellite-based approach available)
Ceiling:	400 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Equipment:	REILs, MIRLs, PAPI	☑ meets	

Weather:	on-field, 24/7, data-linked	☑ meets	
Access to ATC Clearance:	RTR	☑ meets	
ADS-B Coverage:	On ground	☐ meets	

Overall Recommendations

GENERAL		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Weather Reporting Upgrade existing AWOS-III to include lightning and freezing rain sensor.	Improves information available to pilot.	$60,000
Data link Provide ADS-B coverage while on the ground.	Provides traffic surveillance, terrain avoidance, weather data, etc. Crucial component for Next Generation Air Transportation System.	$100,000
Local Area Augmentation System (LAAS) Provide LAAS coverage to augment existing global positioning system.	Provides enhanced signal accuracy.	Unknown

RUNWAY 2 20		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Airfield Lighting Control Change control sequence and/or facility directory note for HIRLs to be preset on low intensity with higher intensity activated on CTAF.	Provides visibilty of landing environment during night and adverse weather conditions even during times of aircraft equipment failure or pilot control system malfunction.	Less than $10,000

Overall Recommendations

RUNWAY 2		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions (trees).	Standards.	Varies
Weather Reporting Install Runway Visual Range (RVR) equipment.	Replaces prevailing visibility measurement.	$400,000
Aeronautical Survey Request / complete aeronautical survey to enable development of LNAV and LPV approaches to Runway 2.	Provides survey data for instrument approach procedures.	$50,000 (duplicate)
New Procedure Request development of RNAV (GPS) RWY 2 Approach with LPV and LNAV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost

RUNWAY 20		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Aeronautical Survey Request / complete aeronautical survey to enable development of LPV approach to Runway 20.	Provides survey data for instrument approach procedures.	Underway
New Procedure Request development of RNAV (GPS) RWY 20 Approach with LPV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost

Overall Recommendations

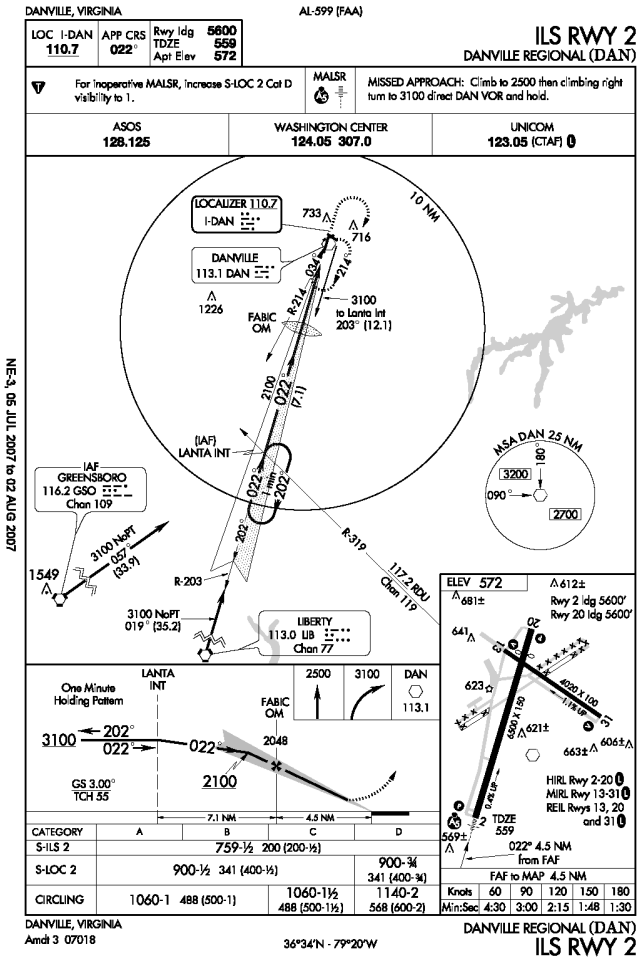
RUNWAY 13		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Aeronautical Survey Request / complete aeronautical survey to enable development of LNAV and LPV approaches to Runway 13 or Runway 31.	Provides survey data for instrument approach procedures.	$50,000 (duplicate)
New Procedure Request development of RNAV (GPS) RWY 13 or RNAV (GPS) RWY 31 Approach with LPV and LNAV landing minimums.	Improve all-weather capability of the runway and airport and eliminate requirement for circle-to-land operations.	No equipment cost

RUNWAY 31		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions (trees).	Standards.	Varies

Danville Regional (DAN)

Danville, Virginia

Procedure Overview



ILS RWY 2 - ILS

FAA PROCEDURE DATA	
Critical Obstacle:	**see note 1**
Required Obstacle Clearance:	
Remote Altimeter Adjustment:	
Accuracy Code Adjustment:	
Other Adjustment:	**see note 2**
Rounding Adjustment:	
Minimum Descent Altitude / Decision Height:	759

Note 1: ASC

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

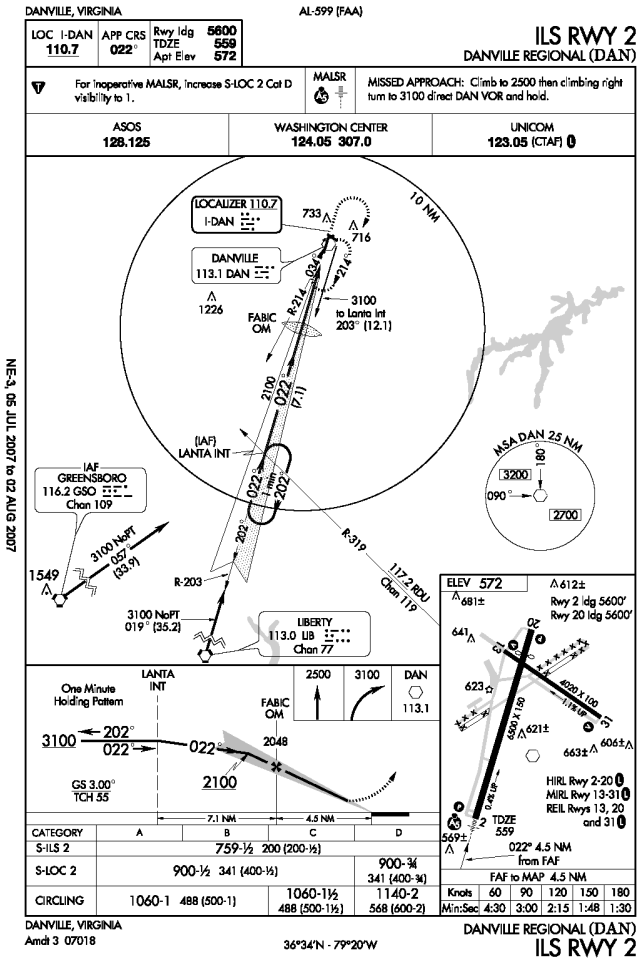
TABLE A16-1A - PRECISION INSTRUMENT APPROACH REQUIREMENTS

	<3/4 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	34:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	4,200 ft (Paved)	None
Runway Markings	Precision	None
Holding Position Signs and Markings	Precision	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	MALSR, SSALR, or ALSF	None
Runway Design Standards	<3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 9, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Danville Regional (DAN)

Danville, Virginia

Procedure Overview



ILS RWY 2 - LOC

FAA PROCEDURE DATA		
Critical Obstacle:	644	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	6	
Minimum Descent Altitude / Decision Height:	900	

Note 1: 80' Tree 2C

Note 2:

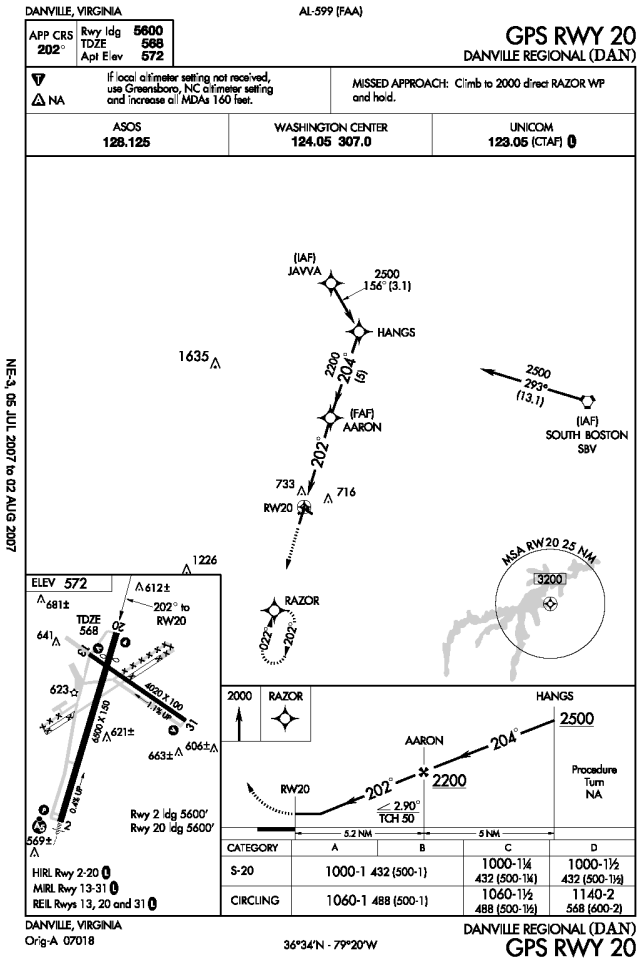
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	<3/4 SM	**KNOWN DEFICIENCIES**
	REQUIRED	
TERPS Paragraph 251	34:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	4,200 ft (Paved)	None
Runway Markings	Precision	None
Holding Position Signs and Markings	Precision	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	MALSR, SSALR, or ALSF Required	None
Runway Design Standards	<3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 9, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Danville Regional (DAN)

Danville, Virginia

Procedure Overview



GPS RWY 20

FAA PROCEDURE DATA		
Critical Obstacle:	733	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	17	
Minimum Descent Altitude / Decision Height:	1000	

Note 1: Tank

Note 2:

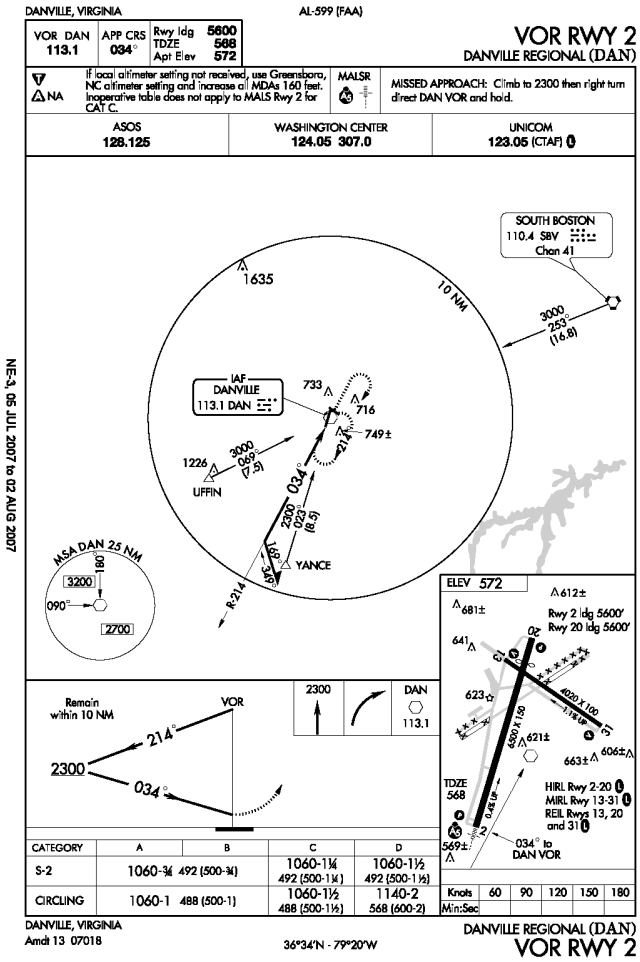
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	1 SM	**KNOWN DEFICIENCIES**
	REQUIRED	
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Danville Regional (DAN)

Danville, Virginia

Procedure Overview



VOR RWY 2

FAA PROCEDURE DATA		
Critical Obstacle:	749	**see note 1**
Required Obstacle Clearance:	300	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	11	
Minimum Descent Altitude / Decision Height:	1060	

Note 1: not listed

Note 2:

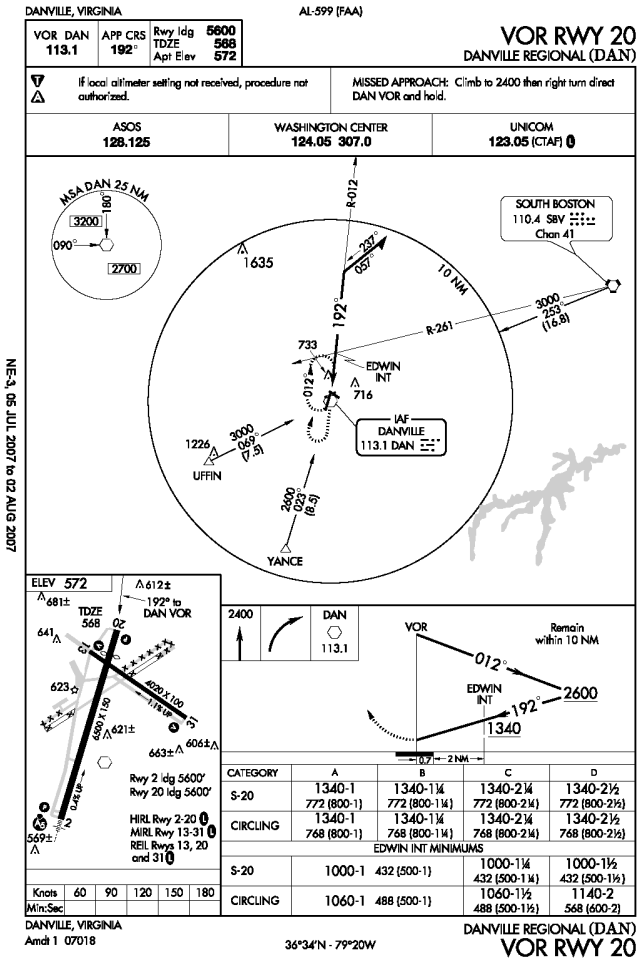
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	<1 SM	**KNOWN DEFICIENCIES**
	REQUIRED	
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft (Paved)	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	Required	None
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 8, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Danville Regional (DAN)

Danville, Virginia

Procedure Overview



VOR RWY 20

FAA PROCEDURE DATA		
Critical Obstacle:	733	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	17	
Minimum Descent Altitude / Decision Height:	1000	

Note 1: Tank

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	1 SM	**KNOWN DEFICIENCIES**
	REQUIRED	
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Recommendations

ILS RWY 2		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Weather Reporting Install Runway Visual Range (RVR) equipment.	Reduces visibility minima to as low as 2400 feet RVR (in lieu of prevailing visibility).	$400,000 (duplicate)

GPS RWY 20		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Procedure Review Request procedure title be updated to RNAV (GPS) RWY 20 format.	Procedure clarity.	No equipment cost

VOR RWY 2		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Distance Measuring Equipment Install Distance Measuring Equipment (DME). Co-locate with Danville VOR (DAN).	Improves pilot's situational awareness. Provides method to establish the final approach fix.	$200,000

Procedure Recommendations

VOR RWY 20		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Distance Measuring Equipment Install Distance Measuring Equipment (DME). Co-locate with Danville VOR (DAN).	Improves pilot's situational awareness. Provides method to establish the final approach fix.	$200,000 (duplicate)

Dinwiddie County (PTB)

Petersburg, Virginia

AIRPORT INFORMATION	
ROLE / CLASSIFICATION INFORMATION	
VATSP Classfication (2008):	General Aviation Regional
NPIAS Role (2008):	General Aviation
Study Classification:	General Aviation Regional (3/4 mile visibility)

ACTIVITY INFORMATION	
Based Aircraft (2007):	71
Annual Operations (2020):	54694
Annual Enplanements (2020):	n/a

DEVELOPMENT INFORMATION (2008)	
Critical Airport Reference Code (Existing):	B-II
Critical Airport Reference Code (Proposed):	n/a
Airport Layout Plan (Original):	August, 1992
Airport Layout Plan (Revision):	June, 2007

Proposed Development (from ALD):
- Widen RWY 14-32 (60')
- Increase RWY 5-23 strength to 25,000#
- Increase RWY 14-32 strength to 12,500#

AERONAUTICAL SURVEY INFORMATION

Runway End	Survey Type	Survey Date
all	Photoslope	2006
23	ANA-LPV	2006
5	ANA-LPV	2006

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS	
Available Weather Reporting:	AWOS-III (PT)
Common Traffic Advisory Frequency:	122.7
Clearance Delivery:	GCO

Nearby Navigational Aids:

RICHMOND	VORTAC	114.1	RIC	214°/ 21.1 NM TO FIELD
PETERSBURG	NDB	284	PTB	053°/ 4.6 NM TO FIELD
LAWRENCEVILLE	VORTAC	112.9	LVL	049°/ 29.0 NM TO FIELD
HOPEWELL	VORTAC	112	HPW	251°/ 20.6 NM TO FIELD
FLAT ROCK	VORTAC	113.3	FAK	150°/ 25.7 NM TO FIELD

Dinwiddie County (PTB)

Petersburg, Virginia

Instrument Approach Procedure Summary

Minimums listed are Category B

EXISTING PROCEDURES		
RUNWAY 23		
RNAV (GPS) RWY 23 - LNAV	720 - 1 (528)	Orig
VOR RWY 23	700 - 1 (508)	Amdt 5
RUNWAY 5		
LOC RWY 5	620 - 3/4 (427)	Amdt 1A
RNAV (GPS) RWY 5 - LNAV	660 - 1 (467)	Orig

PROCEDURES PROPOSED AS PART OF STUDY
RNAV (GPS) RWY 23 - LPV
RNAV (GPS) RWY 5 - LPV

VISIBILITY CHANGES PROPOSED AS PART OF STUDY	
none	

REVIEWER COMMENTS

The Airport Sponsor completed the requested informational survey.

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 14 32 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	B-I	B-I
Runway Dimensions (Length x Width in ft):	3061 x 50	3061 x 60
Runway to Taxiway Separation (feet):	none	225
Runway Lighting:	none	MIRL
RUNWAY 14		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	250 x 450 x 1000	250 x 450 x 1000
Runway Markings:	Visual	Visual
Available Visual Approach Aids:	none	PAPI; REILs
RUNWAY 32		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	250 x 450 x 1000	250 x 450 x 1000
Runway Markings:	Visual	Visual
Available Visual Approach Aids:	none	PAPI; REILs
RUNWAY 5 23 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	B-II	B-II
Runway Dimensions (Length x Width in ft):	5002 x 100	5002 x 100
Runway to Taxiway Separation (feet):	485	485
Runway Lighting:	MIRL	MIRL
RUNWAY 5		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 1010 x 1700	1000 x 1510 x 1700
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	PAPI; ODALS	PAPI; ODALS
RUNWAY 23		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 1010 x 1700	1000 x 1425 x 1700
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	PAPI; REILs	PAPI; REILs

Dinwiddie County (PTB)

Petersburg, Virginia

System Benchmarks

General Aviation Regional (3/4 mile visibility)			
Best Approach (Primary Runway End)			
BENCHMARK		**RUNWAY 5**	
Approach:	Ground-based	☑ meets	LOC RWY 5
Ceiling:	400 AGL	☐ meets	
Visibility:	3/4 statute mile	☑ meets	
Approach:	LPV	☐ meets	RNAV (GPS) RWY 5 - LNAV
Ceiling:	250 AGL	☐ meets	
Visibility:	3/4 statute mile	☐ meets	
Equipment:	MALS, HIRLs, PAPI	☐ meets	existing PAPI
Secondary Approach (Different Runway End)			
BENCHMARK		**RUNWAY 23**	
Approach:	Ground-based	☑ meets	VOR RWY 23
Ceiling:	400 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Approach:	LPV	☐ meets	RNAV (GPS) RWY 23 - LNAV
Ceiling:	250 AGL	☐ meets	
Visibility:	1 statute mile	☑ meets	
Equipment:	REILs, HIRLs, PAPI	☐ meets	existing REILs, PAPI

Additional Requirements			
Weather:	on-field, 24/7, data-linked	☑ meets	
Access to ATC Clearance:	RTR	☐ meets	
ADS-B Coverage:	On ground	☐ meets	

Overall Recommendations

GENERAL		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Weather Reporting Upgrade existing AWOS-III to include freezing rain sensor.	Improves information available to pilot.	$50,000
Communications Upgrade existing Ground Communication Outlet (GCO) to a Remote Transmitter / Receiver (RTR) directly with Potomac Approach.	Improves clearance delivery process. Provides direct communication with approach control. Used by aircraft on ground for obtaining or canceling IFR clearances.	$40,000
Communications Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	Improves pilot/controller communications and clearance delivery process.	Less than $5,000
Data link Provide ADS-B coverage while on the ground.	Provides traffic surveillance, terrain avoidance, weather data, etc. Crucial component for Next Generation Air Transportation System.	$100,000
Local Area Augmentation System (LAAS) Provide LAAS coverage to augment existing global positioning system.	Provides enhanced signal accuracy.	Unknown

RUNWAY 5 23		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Airfield Lighting Control Change control sequence and/or facility directory note for MIRLs to be preset on low intensity with higher intensity activated on CTAF.	Provides visibilty of landing environment during night and adverse weather conditions even during times of aircraft equipment failure or pilot control system malfunction.	Less than $10,000
Runway Lighting Replace Medium Intensity Runway Lights (MIRLs) with High Intensity Runway Lights (HIRLs).	Improves pilot's ability to detect the runway environment.	$300,000

Overall Recommendations

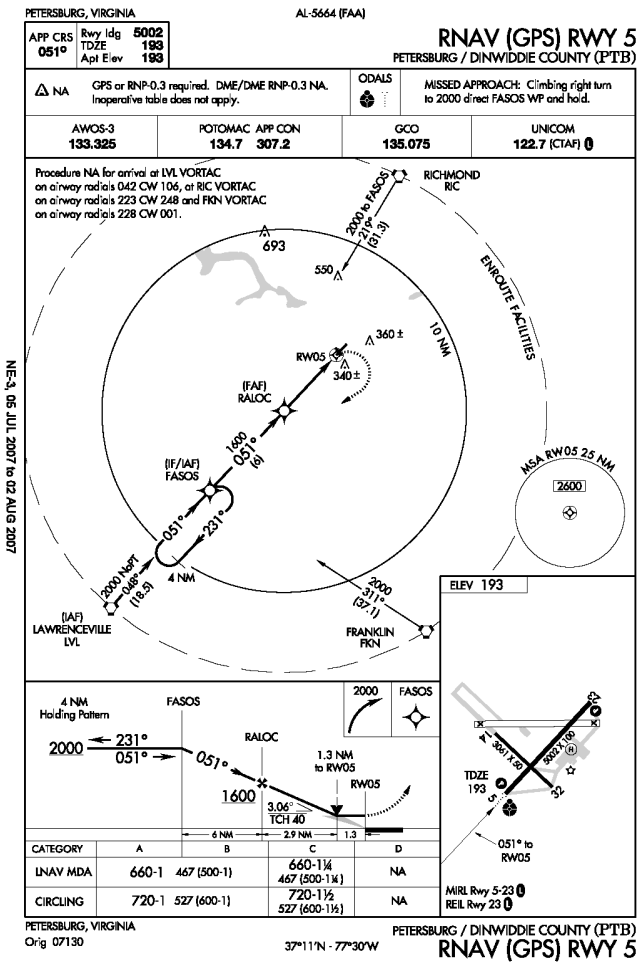
RUNWAY 5		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions (tree).	Standards.	Varies
Approach Lighting System Upgrade Runway 5 ODALS to MALS.	Improves pilot's ability to detect the landing environment.	$400,000
Aeronautical Survey Request / complete aeronautical survey to enable development of LPV approach to Runway 5.	Provides survey data for instrument approach procedures.	Completed 2006
New Procedure Request development of RNAV (GPS) RWY 5 Approach with LPV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost

RUNWAY 23		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions (tree).	Standards.	Varies
Aeronautical Survey Request / complete aeronautical survey to enable development of LPV approach to Runway 23.	Provides survey data for instrument approach procedures.	Completed 2006
New Procedure Request development of RNAV (GPS) RWY 23 Approach with LPV landing minimums.	Improve all-weather capability of the runway and airport. Provides vertical guidance.	No equipment cost

Dinwiddie County (PTB)

Petersburg, Virginia

Procedure Overview



RNAV (GPS) RWY 5 - LNAV

FAA PROCEDURE DATA		
Critical Obstacle:	399	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	11	
Minimum Descent Altitude / Decision Height:	660	

Note 1: Tree

Note 2:

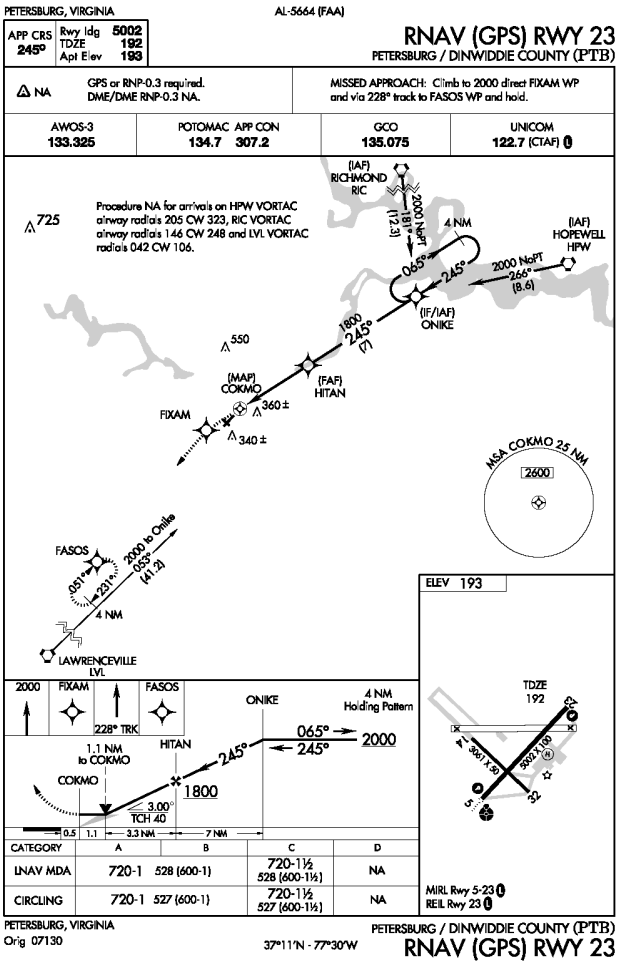
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	None
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Overview



RNAV (GPS) RWY 23 - LNAV

FAA PROCEDURE DATA		
Critical Obstacle:	414	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:	50	
Other Adjustment:		**see note 2**
Rounding Adjustment:	6	
Minimum Descent Altitude / Decision Height:	720	

Note 1: Tower

Note 2:

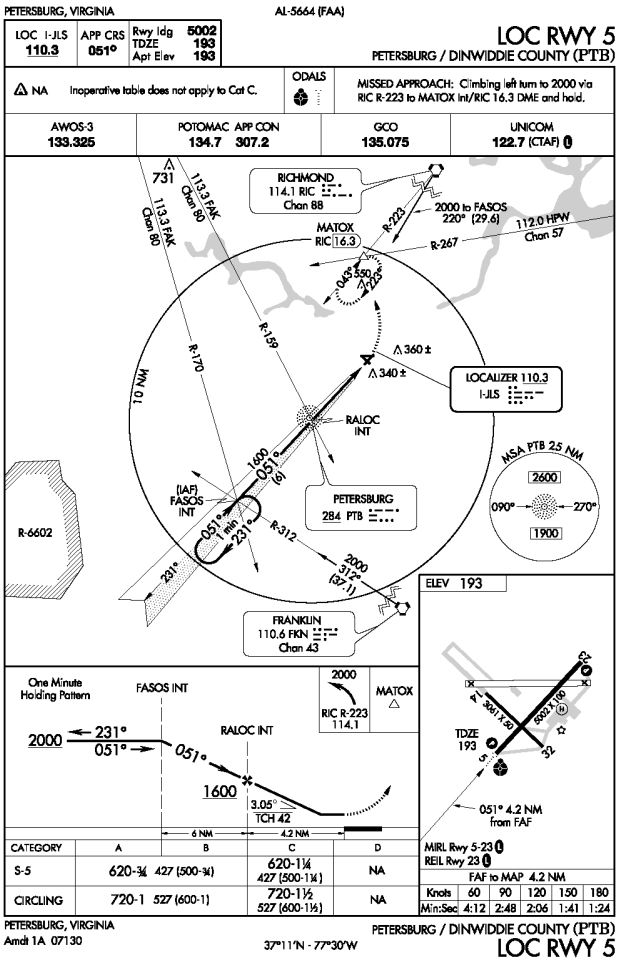
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	1 SM **REQUIRED**	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Dinwiddie County (PTB)

Petersburg, Virginia

Procedure Overview



LOC RWY 5

FAA PROCEDURE DATA		
Critical Obstacle:	369	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	1	
Minimum Descent Altitude / Decision Height:	620	

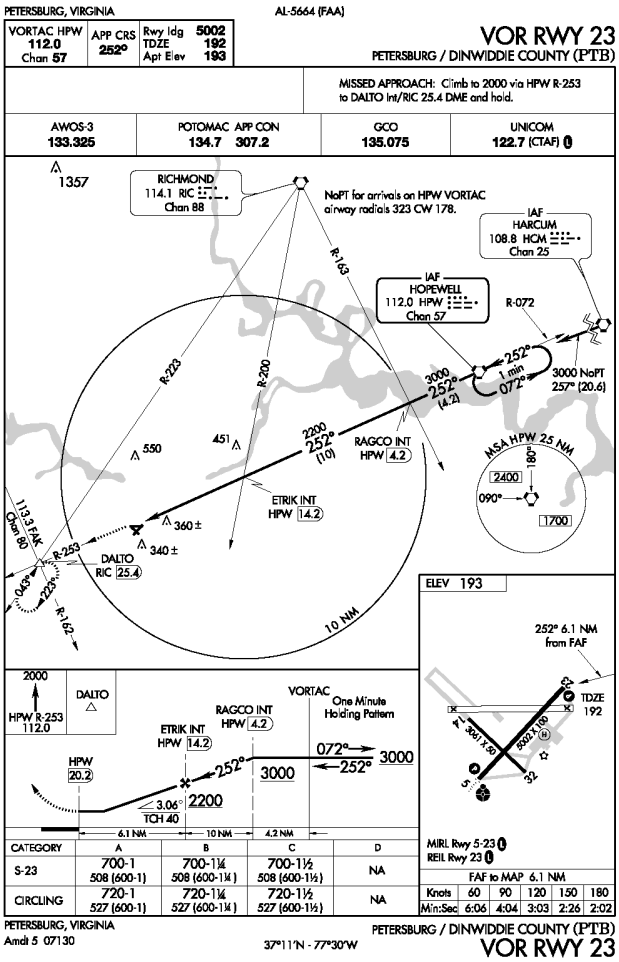
Note 1: Tree

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	<1 SM	**KNOWN DEFICIENCIES**
	REQUIRED	
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft (Paved)	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	Required	None
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 8, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Overview



VOR RWY 23

FAA PROCEDURE DATA		
Critical Obstacle:	439	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	11	
Minimum Descent Altitude / Decision Height:	700	

Note 1: Tower

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM REQUIRED	KNOWN DEFICIENCIES
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Recommendations

RNAV (GPS) RWY 5		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Step-Down Fix Request procedure be modified to include step-down fix.	Minimum Descent Altitude (MDA) may be reduced by as much as 60 feet.	No equipment cost
Procedure Review (Approach Category) Request addition of Approach Category D minimums to the procedure.	Improves accessibility of the airport.	No equipment cost

RNAV (GPS) RWY 23		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Procedure Review (Approach Category) Request addition of Approach Category D minimums to the procedure.	Improves accessibility of the airport.	No equipment cost

Procedure Recommendations

LOC RWY 5		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Procedure Review (Approach Category) Request addition of Approach Category D minimums to the procedure.	Improves accessibility of the airport.	No equipment cost
Distance Measuring Equipment Install Distance Measuring Equipment (DME). Co-locate with the localizer.	Improves pilot's situational awareness. Preferred method to establish the final approach fix.	$100,000

VOR RWY 23		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Step-Down Fix Request procedure be modified to include step-down fix.	Minimum Descent Altitude (MDA) may be reduced by as much as 80 feet.	No equipment cost
Procedure Review (Approach Category) Request addition of Approach Category D minimums to the procedure.	Improves accessibility of the airport.	No equipment cost

Emporia-Greensville Regional (EMV)

Emporia, Virginia

AIRPORT INFORMATION	
ROLE / CLASSIFICATION INFORMATION	
VATSP Classfication (2008):	General Aviation Regional
NPIAS Role (2008):	General Aviation
Study Classification:	General Aviation Regional (1 mile visibility)

ACTIVITY INFORMATION	
Based Aircraft (2007):	6
Annual Operations (2020):	1246
Annual Enplanements (2020):	n/a

DEVELOPMENT INFORMATION (2008)	
Critical Airport Reference Code (Existing):	B-II
Critical Airport Reference Code (Proposed):	B-II
Airport Layout Plan (Original):	September, 1992
Airport Layout Plan (Revision):	July, 2000

Proposed Development (from ALD):

- Complete parallel taxiway
- Install ODALS (RWY 33)

AERONAUTICAL SURVEY INFORMATION

Runway End	Survey Type	Survey Date
all	Photoslope	2007

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS	
Available Weather Reporting:	AWOS-III (PT)
Common Traffic Advisory Frequency:	123.0
Clearance Delivery:	Phone

Nearby Navigational Aids:

LAWRENCEVILLE	VORTAC	112.9	LVL	119°/ 21.7 NM TO FIELD
FRANKLIN	VORTAC	110.6	FKN	275°/ 22.7 NM TO FIELD
EMPORIA	NDB	261	ELQ	336°/ 5.0 NM TO FIELD

Emporia-Greensville Regional (EMV)

Emporia, Virginia

Instrument Approach Procedure Summary

Minimums listed are Category B

EXISTING PROCEDURES		
RUNWAY 33		
LOC RWY 33	420 - 1 (299)	Orig A
RNAV (GPS) RWY 33 - LNAV	420 - 1 (299)	Orig A

PROCEDURES PROPOSED AS PART OF STUDY
RNAV (GPS) RWY 15 - LNAV
RNAV (GPS) RWY 15 - LPV
RNAV (GPS) RWY 33 - LPV

VISIBILITY CHANGES PROPOSED AS PART OF STUDY	
none	

REVIEWER COMMENTS

A new approach to Runway 15 would eliminate the requirement for circle-to-land operations when the wind and weather conditions favor landing to the south.

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 15 33 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	B-II	B-II
Runway Dimensions (Length x Width in ft):	5044 x 100	5007 x 100
Runway to Taxiway Separation (feet):	300	300
Runway Lighting:	MIRL	MIRL
RUNWAY 15		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 700 x 1000	500 x 700 x 1000
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	PAPI; REILs	PAPI; REILs
RUNWAY 33		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 1010 x 1700	1000 x 1510 x 1700
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	PAPI; REILs	PAPI; REILs

Emporia-Greensville Regional (EMV)

Emporia, Virginia

System Benchmarks

General Aviation Regional (1 mile visibility)			
Best Approach (Primary Runway End)			
BENCHMARK		**RUNWAY 33**	
Approach:	Ground-based	☑ meets	LOC RWY 33
Ceiling:	400 AGL	☑ meets	
Visibility:	1 statute mile	☑ meets	
Approach:	LPV	☐ meets	RNAV (GPS) RWY 33 - LNAV
Ceiling:	250 AGL	☐ meets	
Visibility:	1 statute mile	☑ meets	
Equipment:	REILs (or approach lights), MIRLs, PAPI	☑ meets	
Secondary Approach (Different Runway End)			
BENCHMARK		**RUNWAY 15**	
Approach:		☐ meets	n/a (no ground-based approach available)
Ceiling:		☐ meets	
Visibility:		☐ meets	
Approach:	LNAV	☐ meets	n/a (no satellite-based approach available)
Ceiling:	400 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Equipment:	REILs, MIRLs, PAPI	☑ meets	

Additional Requirements			
Weather:	on-field, 24/7, data-linked	☑ meets	
Access to ATC Clearance:	RTR or GCO	☐ meets	
ADS-B Coverage:	On ground	☐ meets	

Overall Recommendations

GENERAL		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Weather Reporting Upgrade existing AWOS-III to include freezing rain sensor.	Improves information available to pilot.	$50,000
Communications Install a Ground Communication Outlet (GCO) directly with Washington Center.	Provides direct communication with approach control via radio and an "on-demand" telephone land line link. Used by aircraft on ground for obtaining or canceling IFR clearances.	$20,000
Communications Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	Improves pilot/controller communications and clearance delivery process.	Less than $5,000
Data link Provide ADS-B coverage while on the ground.	Provides traffic surveillance, terrain avoidance, weather data, etc. Crucial component for Next Generation Air Transportation System.	$100,000
Procedure Review Update airport diagram to show partial parallal taxiway.	Improves pilot's situational awareness.	No equipment cost

RUNWAY 15 33		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Airfield Lighting Control Change control sequence and/or facility directory note for MIRLs to be preset on low intensity with higher intensity activated on CTAF.	Provides visibilty of landing environment during night and adverse weather conditions even during times of aircraft equipment failure or pilot control system malfunction.	Less than $10,000

Overall Recommendations

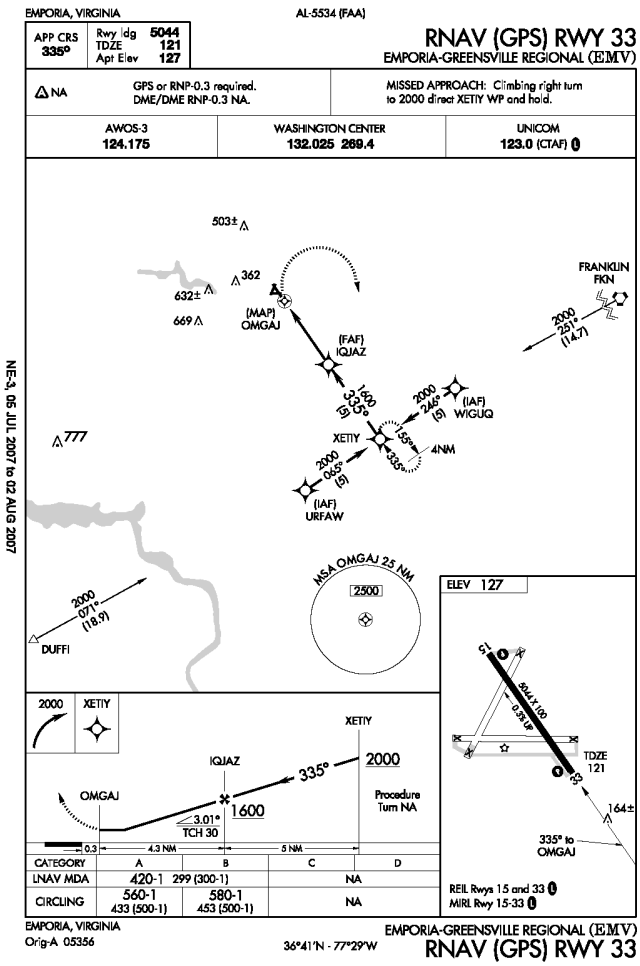
RUNWAY 15		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Aeronautical Survey Request / complete aeronautical survey to enable development of LNAV and LPV approaches to Runway 15.	Provides survey data for instrument approach procedures.	$50,000
New Procedure Request development of RNAV (GPS) RWY 15 Approach with LPV and LNAV landing minimums.	Improve all-weather capability of the runway and airport and eliminate requirement for circle-to-land operations. An LNAV approach may support minimums as low as 520-1 (393) with a reduction in HAT of 60 feet.	No equipment cost

RUNWAY 33		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Aeronautical Survey Request / complete aeronautical survey to enable development of LPV approach to Runway 33.	Provides survey data for instrument approach procedures.	$50,000 (duplicate)
New Procedure Request development of RNAV (GPS) RWY 33 Approach with LPV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost

Emporia-Greensville Regional (EMV)

Emporia, Virginia

Procedure Overview



RNAV (GPS) RWY 33 - LNAV

FAA PROCEDURE DATA		
Critical Obstacle:	164	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	6	
Minimum Descent Altitude / Decision Height:	420	

Note 1: Trees

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

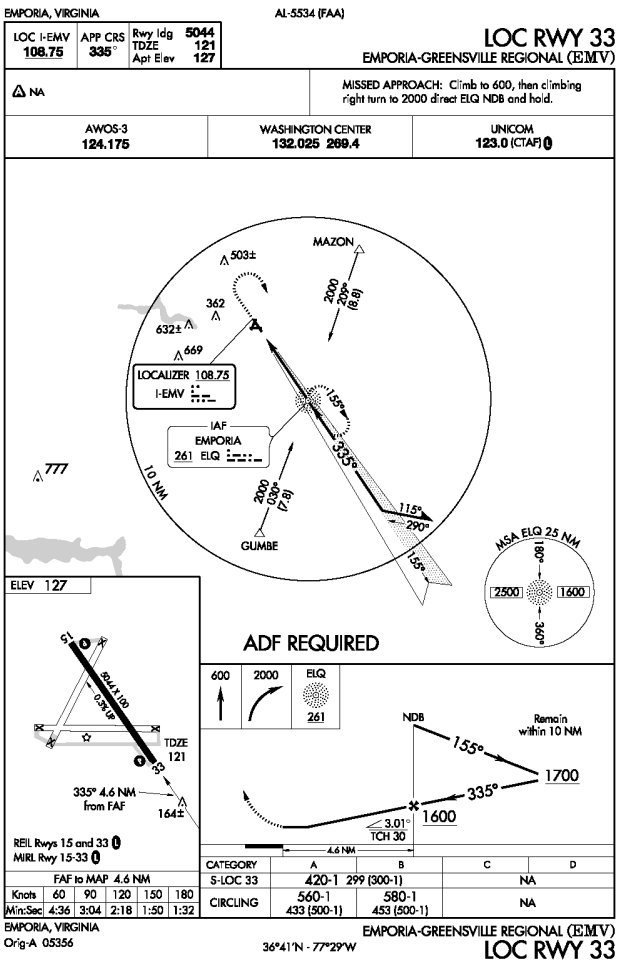
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	Yes
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Emporia-Greensville Regional (EMV)

Emporia, Virginia

Procedure Overview



LOC RWY 33

FAA PROCEDURE DATA		
Critical Obstacle:	164	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	6	
Minimum Descent Altitude / Decision Height:	420	

Note 1: Trees

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	Yes
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Recommendations

RNAV (GPS) RWY 33		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Procedure Review (Approach Category) Request addition of Approach Category C and D minimums to the procedure.	Improves accessibility of the airport.	No equipment cost

LOC RWY 33		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Procedure Review Request procedure be modified to eliminate ADF requirement.	Procedure simplification and improved reliability.	No equipment cost
Distance Measuring Equipment Install Distance Measuring Equipment (DME). Co-locate with the localizer.	Improves pilot's situational awareness. Preferred method to establish the final approach fix.	$100,000
Procedure Review (Approach Category) Request addition of Approach Category C and D minimums to the procedure.	Improves accessibility of the airport.	No equipment cost
Facility Replacement Replace problematic localizer.	Improves reliability.	$100,000

Falwell (W24)

Lynchburg, Virginia

AIRPORT INFORMATION	
ROLE / CLASSIFICATION INFORMATION	
VATSP Classfication (2008):	Local Service
NPIAS Role (2008):	n/a
Study Classification:	Local Service

ACTIVITY INFORMATION	
Based Aircraft (2007):	27
Annual Operations (2020):	10273
Annual Enplanements (2020):	n/a

DEVELOPMENT INFORMATION (2008)	
Critical Airport Reference Code (Existing):	B-I
Critical Airport Reference Code (Proposed):	n/a
Airport Layout Plan (Original):	January, 1998
Airport Layout Plan (Revision):	n/a

Proposed Development (from ALD):

- RWY 10-28 operational in both directions

AERONAUTICAL SURVEY INFORMATION

Runway End	Survey Type	Survey Date
all	Photoslope	2000

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS	
Available Weather Reporting:	None
Common Traffic Advisory Frequency:	123.0
Clearance Delivery:	Phone

Nearby Navigational Aids:

LYNCHBURG	VORTAC	109.2	LYH	041°/ 9.2 NM TO FIELD
BOJAR	NDB	385	LY	048°/ 9.0 NM TO FIELD

Falwell (W24)

Lynchburg, Virginia

Instrument Approach Procedure Summary

Minimums listed are Category B

EXISTING PROCEDURES		
RUNWAY 28		
RNAV (GPS) RWY 28 - LNAV	1460 - 1 (521)	Orig

VISIBILITY CHANGES PROPOSED AS PART OF STUDY	
none	

REVIEWER COMMENTS

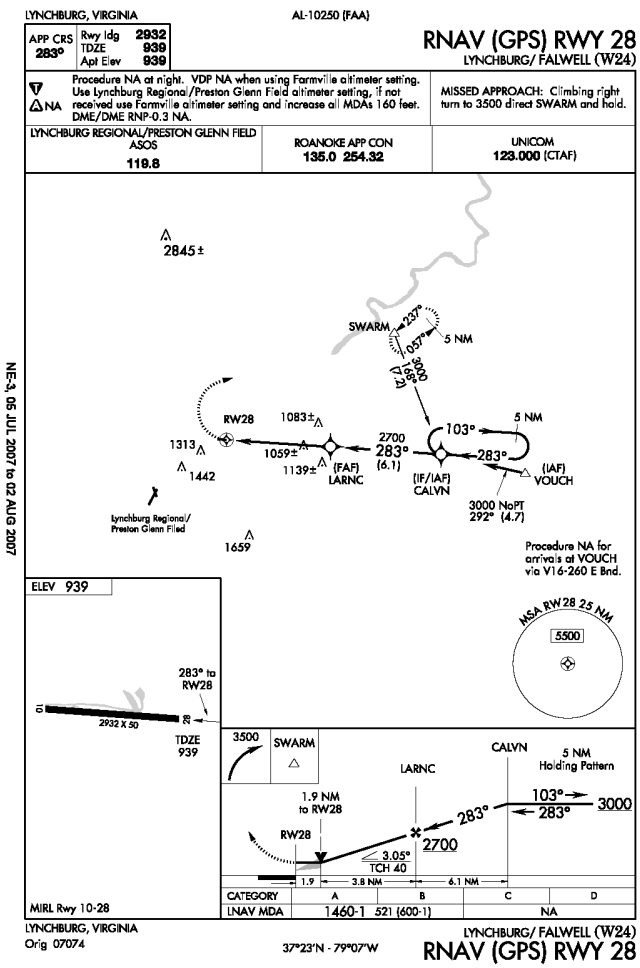
none

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 10 28 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	B-I	B-I
Runway Dimensions (Length x Width in ft):	2932 x 50	2932 x 50
Runway to Taxiway Separation (feet):	none	none
Runway Lighting:	MIRL	MIRL
RUNWAY 10		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	200 x 400 x 1000	200 x 400 x 1000
Runway Markings:	Visual	Visual
Available Visual Approach Aids:	none	PAPI; REILs
RUNWAY 28		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	200 x 400 x 1000	200 x 400 x 1000
Runway Markings:	Visual	Non-Precision
Available Visual Approach Aids:	TRIL	PAPI

Procedure Overview



RNAV (GPS) RWY 28 - LNAV

FAA PROCEDURE DATA		
Critical Obstacle:	1059	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:	134	**see note 2**
Rounding Adjustment:	17	
Minimum Descent Altitude / Decision Height:	1460	

Note 1: AAO

Note 2: missed approach segment

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	Yes
Runway Markings	Nonprecision	Yes
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	Yes
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Recommendations

RNAV (GPS) RWY 28		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
none		

Farmville Regional (FVX)

Farmville, Virginia

AIRPORT INFORMATION	
ROLE / CLASSIFICATION INFORMATION	
VATSP Classfication (2008):	General Aviation Regional
NPIAS Role (2008):	General Aviation
Study Classification:	General Aviation Regional (1 mile visibility)

ACTIVITY INFORMATION	
Based Aircraft (2007):	34
Annual Operations (2020):	14232
Annual Enplanements (2020):	n/a
DEVELOPMENT INFORMATION (2008)	
Critical Airport Reference Code (Existing):	B-II
Critical Airport Reference Code (Proposed):	C-II
Airport Layout Plan (Original):	November, 2005
Airport Layout Plan (Revision):	February, 2006

Proposed Development (from ALD):
- Extend RWY 21 (600')
- Upgrade to C-II
- Upgrade RWY 3 RPZ
- Install Localizer (RWY 3)
- Install ODALS (RWY 3)
- Upgrade RWY 21 RPZ

AERONAUTICAL SURVEY INFORMATION

Runway End	Survey Type	Survey Date
all	Photoslope	2000
all		incl. in Study

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS	
Available Weather Reporting:	AWOS-III (P)
Common Traffic Advisory Frequency:	123.0
Clearance Delivery:	GCO

Nearby Navigational Aids:

FARMVILLE	NDB	367	FVX	AT FIELD

Farmville Regional (FVX)

Farmville, Virginia

Instrument Approach Procedure Summary

Minimums listed are Category B

EXISTING PROCEDURES		
RUNWAY 21		
GPS RWY 21	820 - 1 (403)	Orig
RUNWAY 3		
NDB OR GPS RWY 3	1220 - 1 (810)	Amdt 5

PROCEDURES PROPOSED AS PART OF STUDY
LOC RWY 3
RNAV (GPS) RWY 21 - LPV
RNAV (GPS) RWY 3 - LNAV
RNAV (GPS) RWY 3 - LPV

VISIBILITY CHANGES PROPOSED AS PART OF STUDY	
none	

REVIEWER COMMENTS

The Study recommends a LOC RWY 3 approach to improve the ground-based procedure and allow the decommissioning of the NDB.

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 3 21 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	B-II	C-II
Runway Dimensions (Length x Width in ft):	4400 x 75	5000 x 100
Runway to Taxiway Separation (feet):	none	300
Runway Lighting:	MIRL	MIRL
RUNWAY 3		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 X 700 X 1000	500 X 1010 X 1700
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	PAPI	PAPI; ODALS
RUNWAY 21		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 X 700 X 1000	500 X 1010 X 1700
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	PAPI	PAPI; REILs

Farmville Regional (FVX)

Farmville, Virginia

System Benchmarks

General Aviation Regional (1 mile visibility)			
Best Approach (Primary Runway End)			
BENCHMARK		**RUNWAY 21**	
Approach:	Ground-based	☐ meets	n/a (no ground-based approach available)
Ceiling:	400 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Approach:	LPV	☐ meets	GPS RWY 21
Ceiling:	250 AGL	☐ meets	
Visibility:	1 statute mile	☑ meets	
Equipment:	REILs (or approach lights), MIRLs, PAPI	☐ meets	existing MIRLs, PAPI
Secondary Approach (Different Runway End)			
BENCHMARK		**RUNWAY 3**	
Approach:		☐ meets	NDB OR GPS RWY 22
Ceiling:		☐ meets	
Visibility:		☐ meets	
Approach:	LNAV	☐ meets	n/a (no satellite-based approach available)
Ceiling:	400 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Equipment:	REILs, MIRLs, PAPI	☐ meets	existing MIRLs, PAPI

Additional Requirements			
Weather:	on-field, 24/7, data-linked	☑ meets	
Access to ATC Clearance:	RTR or GCO	☑ meets	
ADS-B Coverage:	On ground	☐ meets	

Overall Recommendations

GENERAL		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Weather Reporting Upgrade existing AWOS-III to include lightning and freezing rain sensor.	Improves information available to pilot.	$60,000
Communications Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	Improves pilot/controller communications and clearance delivery process.	Less than $5,000
Data link Provide ADS-B coverage while on the ground.	Provides traffic surveillance, terrain avoidance, weather data, etc. Crucial component for Next Generation Air Transportation System.	$100,000

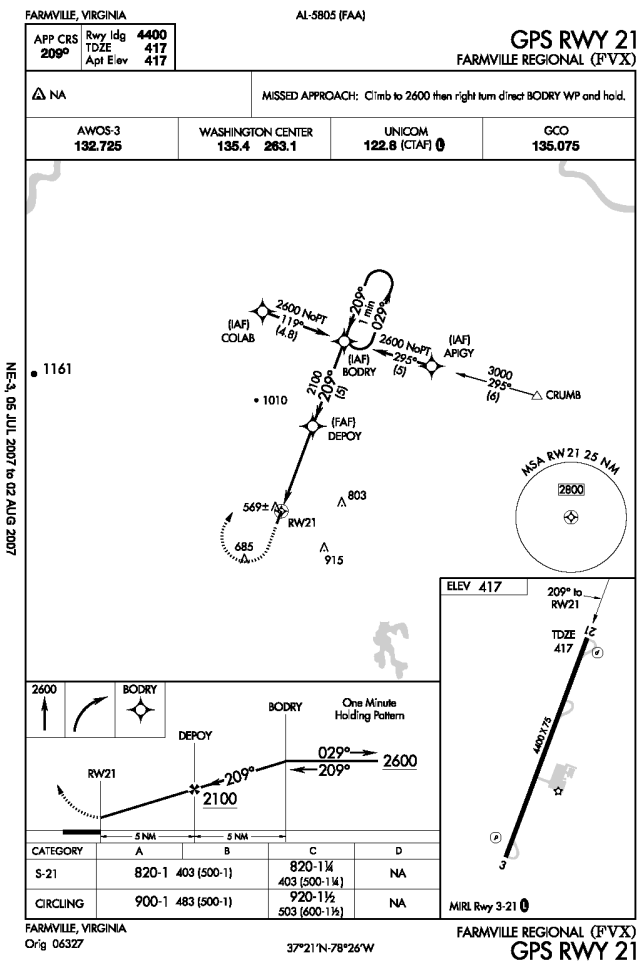
Overall Recommendations

RUNWAY 3		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Runway End Identifier Lights Install REILs for Runway 3.	Improves pilot's ability to detect the landing environment.	$50,000
Precision Approach Path Indicator Upgrade Runway 3 PAPI from a 2 box to a 4 box unit.	Provides improved visual vertical descent guidance information during the approach to the runway.	$20,000
New Procedure Install localizer and request development of LOC RWY 3 approach.	Provides straight-in, ground based approach.	$200,000
Aeronautical Survey Request / complete aeronautical survey to enable development of LNAV and LPV approaches to Runway 3.	Provides survey data for instrument approach procedures.	Underway as part of Study
New Procedure Request development of RNAV (GPS) RWY 3 Approach with LPV and LNAV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost
Obstruction Removal Remove close-in obstructions (tree).	Standards.	Varies

Overall Recommendations

RUNWAY 21		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Runway End Identifier Lights Install REILs for Runway 21.	Improves pilot's ability to detect the landing environment.	$50,000
Precision Approach Path Indicator Upgrade Runway 21 PAPI from a 2 box to a 4 box unit.	Provides improved visual vertical descent guidance information during the approach to the runway.	$20,000
Obstruction Removal Remove close-in obstructions (tree).	Standards.	Varies
Aeronautical Survey Request / complete aeronautical survey to enable development of LPV approach to Runway 21.	Provides survey data for instrument approach procedures.	Underway as part of Study
New Procedure Request development of RNAV (GPS) RWY 21 Approach with LPV landing minimums.	Improve all-weather capability of the runway and airport. Provides vertical guidance.	No equipment cost

Procedure Overview



GPS RWY 21

FAA PROCEDURE DATA		
Critical Obstacle:	569	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	1	
Minimum Descent Altitude / Decision Height:	820	

Note 1: 100' Tree

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

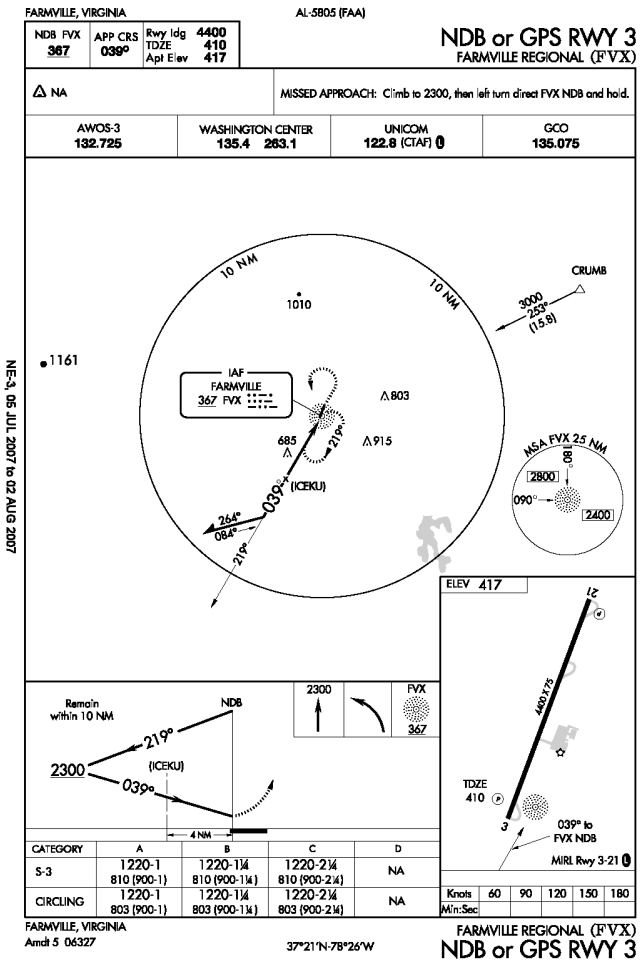
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	Yes
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Farmville Regional (FVX)

Farmville, Virginia

Procedure Overview



NDB OR GPS RWY 3

FAA PROCEDURE DATA		
Critical Obstacle:	810	**see note 1**
Required Obstacle Clearance:	350	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:	50	
Other Adjustment:		**see note 2**
Rounding Adjustment:	10	
Minimum Descent Altitude / Decision Height:	1220	

Note 1: Tower (47-1489)

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	Yes
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Recommendations

GPS RWY 21		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Procedure Review Request procedure title be updated to RNAV (GPS) RWY 21 format.	Procedure clarity.	No equipment cost
Procedure Review (Approach Category) Request addition of Approach Category D minimums to the procedure.	Improves accessibility of the airport.	No equipment cost

NDB OR GPS RWY 3		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Procedure Review Request procedure be updated to separate GPS approach from ground-based approach.	Procedure clarity.	No equipment cost
Procedure Review Cancel procedure when RNAV (GPS) RWY 3 and LOC RWY 3 procedures are published.	Allows decommissioning of NDB.	No equipment cost

Franklin Municipal-John Beverly Rose (FKN)

Franklin, Virginia

AIRPORT INFORMATION	
ROLE / CLASSIFICATION INFORMATION	
VATSP Classfication (2008):	General Aviation Community
NPIAS Role (2008):	General Aviation
Study Classification:	General Aviation Community

ACTIVITY INFORMATION	
Based Aircraft (2007):	25
Annual Operations (2020):	6237
Annual Enplanements (2020):	n/a

DEVELOPMENT INFORMATION (2008)	
Critical Airport Reference Code (Existing):	B-II
Critical Airport Reference Code (Proposed):	C-II
Airport Layout Plan (Original):	May, 2002
Airport Layout Plan (Revision):	March, 2003

Proposed Development (from ALD):
- Install LOC (RWY 9)
- Upgrade to C-II
- Increase runway strength to 60,000# dual

AERONAUTICAL SURVEY INFORMATION

Runway End	Survey Type	Survey Date
all	Photoslope	2001

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS	
Available Weather Reporting:	AWOS-III
Common Traffic Advisory Frequency:	122.8
Clearance Delivery:	GCO (unreliable)

Nearby Navigational Aids:

WALEY	NDB	249	RK	306°/ 13.6 NM TO FIELD
FRANKLIN	VORTAC	110.6	FKN	110°/ 5.3 NM TO FIELD
COFIELD	VORTAC	114.6	CVI	004°/ 19.6 NM TO FIELD

Franklin Municipal-John Beverly Rose (FKN)

Franklin, Virginia

Instrument Approach Procedure Summary

Minimums listed are Category B

EXISTING PROCEDURES		
RUNWAY 27		
RNAV (GPS) RWY 27 - LNAV	460 - 3/4 (419)	Orig
VOR/DME RWY 27	640 - 3/4 (599)	Amdt 9D
RUNWAY 9		
RNAV (GPS) RWY 9 - LNAV	580 - 1 (545)	Orig
VOR RWY 9	580 - 1 (545)	Amdt 14B

PROCEDURES PROPOSED AS PART OF STUDY
RNAV (GPS) RWY 9 - LPV or LP

VISIBILITY CHANGES PROPOSED AS PART OF STUDY	
none	

REVIEWER COMMENTS

The airport does not currently have any vertically-guided approaches. The Study recommends the addition of LPV landing minimums to the RNAV (GPS) RWY 9 approach. The Airport Sponsor completed the requested informational survey.

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 9 27 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	B-II	C-II
Runway Dimensions (Length x Width in ft):	4977 x 100	4977 x 100
Runway to Taxiway Separation (feet):	partial	300
Runway Lighting:	MIRL	MIRL
RUNWAY 9		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 700 x 1000	500 x 700 x 1000
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	PAPI	PAPI; REILs
RUNWAY 27		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 700 x 1000	500 x 700 x 1000
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	PAPI	PAPI; REILs

Franklin Municipal-John Beverly Rose (FKN)

Franklin, Virginia

System Benchmarks

General Aviation Community			
Best Approach (Primary Runway End)			
BENCHMARK		**RUNWAY 27**	
Approach:	Ground-based	☑ meets	VOR/DME RWY 27
Ceiling:	500 AGL	☐ meets	
Visibility:	1 statute mile	☑ meets	
Approach:	LNAV	☑ meets	RNAV (GPS) RWY 27 - LNAV
Ceiling:	400 AGL	☐ meets	
Visibility:	1 statute mile	☑ meets	
Equipment:	REILs, MIRLs, PAPI	☐ meets	existing MIRLs, PAPI
Secondary Approach (Different Runway End)			
BENCHMARK		**RUNWAY 9**	
Approach:		☐ meets	VOR RWY 9
Ceiling:		☐ meets	
Visibility:		☐ meets	
Approach:	LNAV	☑ meets	RNAV (GPS) RWY 9 - LNAV
Ceiling:	500 AGL	☐ meets	
Visibility:	1 statute mile	☑ meets	
Equipment:	REILs, MIRLs, PAPI	☐ meets	existing MIRLs, PAPI

Additional Requirements			
Weather:	Normally on-field, 24/7, data-linked	☑ meets	
Access to ATC Clearance:	RTR or GCO	☑ meets	
ADS-B Coverage:	1000 AGL	☐ meets	

Overall Recommendations

GENERAL		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Weather Reporting Upgrade existing AWOS-III to include present weather, lightning and freezing rain sensor.	Improves information available to pilot.	$60,000
Communications Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	Improves pilot/controller communications and clearance delivery process.	Less than $5,000
Data link Provide ADS-B coverage at 1000 AGL or lower.	Provides traffic surveillance, terrain avoidance, weather data, etc. Crucial component for Next Generation Air Transportation System.	Unknown

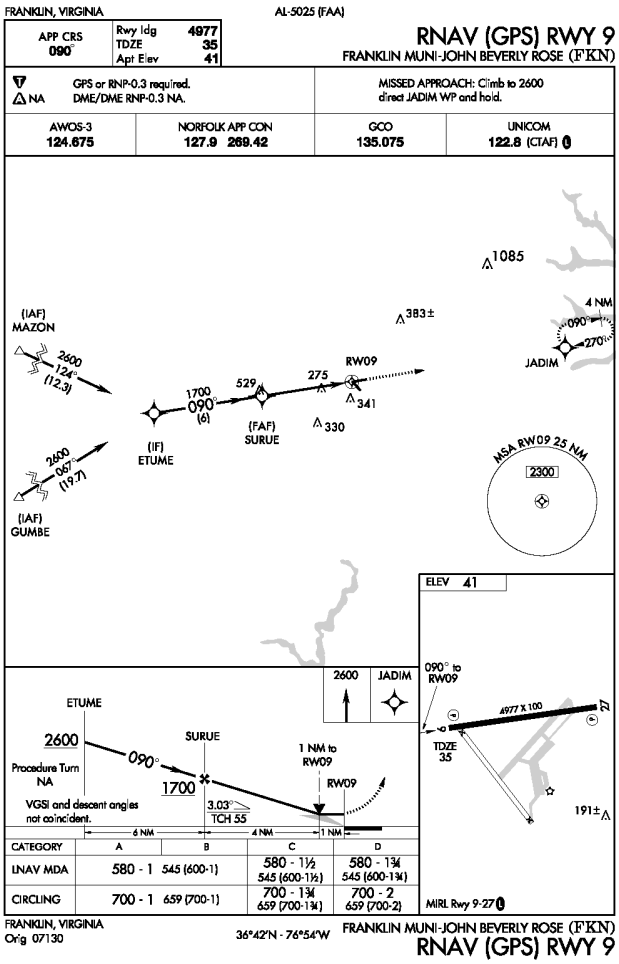
RUNWAY 9 27		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Airfield Lighting Control Change control sequence and/or facility directory note for MIRLs to be preset on low intensity with higher intensity activated on CTAF.	Provides visibilty of landing environment during night and adverse weather conditions even during times of aircraft equipment failure or pilot control system malfunction.	Less than $10,000

Overall Recommendations

RUNWAY 9		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions (brush).	Standards.	Varies
Runway End Identifier Lights Install REILs for Runway 9.	Improves pilot's ability to detect the landing environment.	$50,000
Aeronautical Survey Request / complete aeronautical survey to enable development of LPV approach to Runway 9.	Provides survey data for instrument approach procedures.	$50,000
New Procedure Request development of RNAV (GPS) RWY 9 Approach with LPV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost

RUNWAY 27		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions (brush).	Standards.	Varies
Runway End Identifier Lights Install REILs for Runway 27.	Improves pilot's ability to detect the landing environment.	$50,000

Procedure Overview



RNAV (GPS) RWY 9 - LNAV

FAA PROCEDURE DATA		
Critical Obstacle:	275	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:	50	
Other Adjustment:		**see note 2**
Rounding Adjustment:	5	
Minimum Descent Altitude / Decision Height:	580	

Note 1: Tower 2C

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

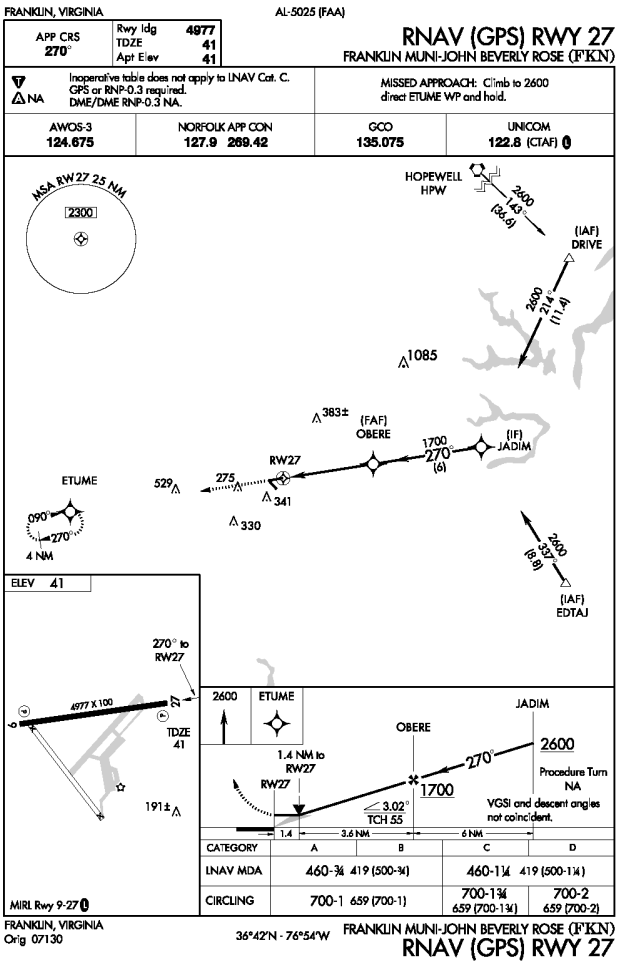
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	Yes
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Franklin Municipal-John Beverly Rose (FKN)

Franklin, Virginia

Procedure Overview



RNAV (GPS) RWY 27 - LNAV

FAA PROCEDURE DATA		
Critical Obstacle:	189	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:	7	**see note 2**
Rounding Adjustment:	14	
Minimum Descent Altitude / Decision Height:	460	

Note 1: 100' Tree 2C

Note 2: missed approach segment

Note 3:

NE-3, 05 JUL 2007 to 02 AUG 2007

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

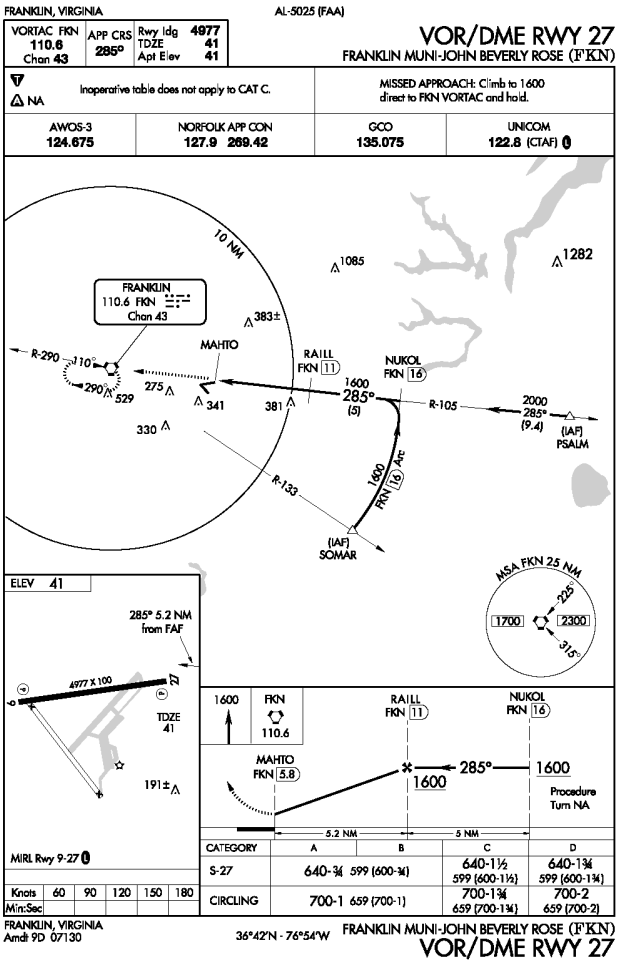
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	<1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft (Paved)	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	Yes
Approach Lights	Required	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 8, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Franklin Municipal-John Beverly Rose (FKN)

Franklin, Virginia

Procedure Overview



VOR/DME RWY 27

FAA PROCEDURE DATA		
Critical Obstacle:	381	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	9	
Minimum Descent Altitude / Decision Height:	640	

Note 1: Tower 2C

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

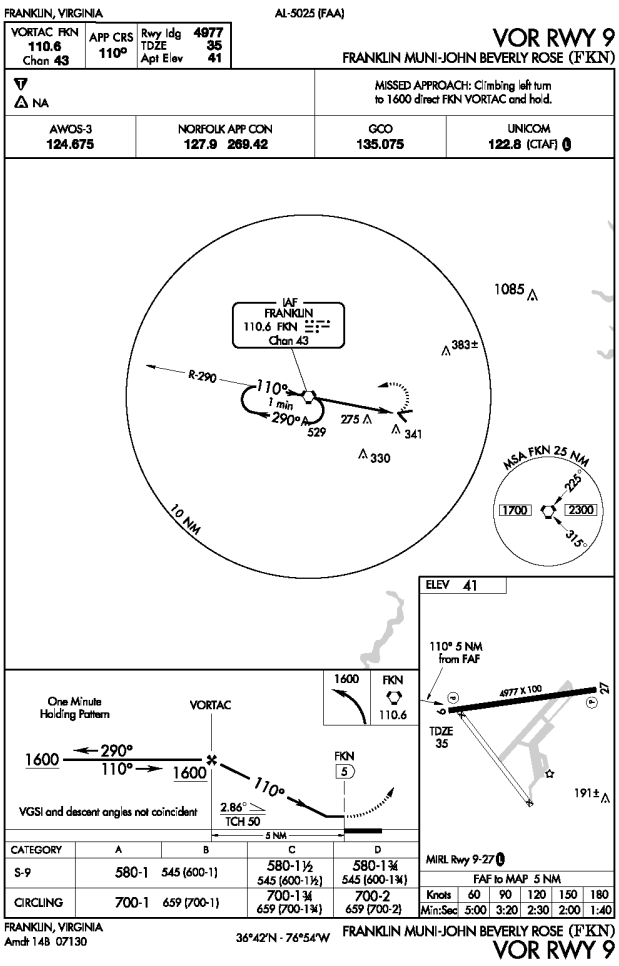
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	<1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft (Paved)	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	Yes
Approach Lights	Required	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 8, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Franklin Municipal-John Beverly Rose (FKN)

Franklin, Virginia

Procedure Overview



VOR RWY 9

FAA PROCEDURE DATA		
Critical Obstacle:	275	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:	50	
Other Adjustment:		**see note 2**
Rounding Adjustment:	5	
Minimum Descent Altitude / Decision Height:	580	

Note 1: Tower

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	Yes
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Recommendations

RNAV (GPS) RWY 9		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Critical Obstacle Field verify critical obstacle to change accuracy code from "D" to "A" or 50 feet to 3 feet.	Minimum Descent Altitude (MDA) may be reduced by 40 to 60 feet.	Less than $10,000

RNAV (GPS) RWY 27		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a

VOR / DME RWY 27		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Step-Down Fix Request procedure be modified to include step-down fix.	Minimum Descent Altitude (MDA) may be reduced.	No equipment cost

VOR RWY 9		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Critical Obstacle Field verify critical obstacle to change accuracy code from "D" to "A" or 50 feet to 3 feet.	Minimum Descent Altitude (MDA) may be reduced by 40 to 60 feet.	Less than $10,000

Front Royal-Warren County (FRR)

Front Royal, Virginia

AIRPORT INFORMATION	
ROLE / CLASSIFICATION INFORMATION	
VATSP Classfication (2008):	General Aviation Community
NPIAS Role (2008):	General Aviation
Study Classification:	General Aviation Community

ACTIVITY INFORMATION	
Based Aircraft (2007):	54
Annual Operations (2020):	18710
Annual Enplanements (2020):	n/a
DEVELOPMENT INFORMATION (2008)	
Critical Airport Reference Code (Existing):	B-I
Critical Airport Reference Code (Proposed):	B-II
Airport Layout Plan (Original):	December, 1991
Airport Layout Plan (Revision):	n/a

Proposed Development (from ALD):
- Extend RWY 9 (993')
- Upgrade to B-II

AERONAUTICAL SURVEY INFORMATION

Runway End	Survey Type	Survey Date
all	Photoslope	2007

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS	
Available Weather Reporting:	None
Common Traffic Advisory Frequency:	123.0
Clearance Delivery:	Phone

Nearby Navigational Aids:

LINDEN	VORTAC	114.3	LDN	335°/ 4.4 NM TO FIELD
COGAN	NDB	364	TZ	230°/13.3 NM TO FIELD
CASANOVA	VORTAC	116.3	CSN	318°/ 24.6 NM TO FIELD

Front Royal-Warren County (FRR)

Front Royal, Virginia

Instrument Approach Procedure Summary

Minimums listed are Category B

EXISTING PROCEDURES		
CIRCLING		
RNAV (GPS) -A	1820 - 1 1/4 (1116)	Orig

PROCEDURES PROPOSED AS PART OF STUDY
RNAV (GPS) RWY 27 - LPV or LP

VISIBILITY CHANGES PROPOSED AS PART OF STUDY	
RUNWAY 27:	1 1/2 SM to 1 SM (no design standard change)

REVIEWER COMMENTS

The airport does not currently have any ground-based or straight-in instrument approach procedures. Terrain may restrict development of straight-in approaches.

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 9 27 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	B-I	B-II
Runway Dimensions (Length x Width in ft):	3007 x 75	4000 x 75
Runway to Taxiway Separation (feet):	225	225
Runway Lighting:	MIRL	MIRL
RUNWAY 9		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	250 X 450 X 1000	250 X 450 X 1000
Runway Markings:	Visual	Visual
Available Visual Approach Aids:	APAP	PAPI
RUNWAY 27		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	250 x 450 x 1000	250 X 450 X 1000
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	APAP	PAPI

Front Royal-Warren County (FRR)

Front Royal, Virginia

System Benchmarks

General Aviation Community			
Best Approach (Primary Runway End)			
BENCHMARK		**RUNWAY 9**	
Approach:	Ground-based	☐ meets	n/a (no ground-based approach available)
Ceiling:	500 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Approach:	LNAV	☐ meets	n/a (no satellite-based approach available)
Ceiling:	400 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Equipment:	REILs, MIRLs, PAPI	☐ meets	
Secondary Approach (Different Runway End)			
BENCHMARK		**RUNWAY 27**	
Approach:		☐ meets	n/a (no ground-based approach available)
Ceiling:		☐ meets	
Visibility:		☐ meets	
Approach:	LNAV	☐ meets	n/a (no satellite-based approach available)
Ceiling:	500 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Equipment:	REILs, MIRLs, PAPI	☐ meets	

Additional Requirements			
Weather:	Normally on-field, 24/7, data-linked	☐ meets	
Access to ATC Clearance:	RTR or GCO	☐ meets	
ADS-B Coverage:	1000 AGL	☐ meets	

Overall Recommendations

GENERAL		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Altimeter Source Install AWOS-A.	Provides local altimeter source.	$25,000
Communications Install a Ground Communication Outlet (GCO) directly with Potomac Approach.	Provides direct communication with approach control via radio and an "on-demand" telephone land line link. Used by aircraft on ground for obtaining or canceling IFR clearances.	$20,000
Data link Provide ADS-B coverage at 1000 AGL or lower.	Provides traffic surveillance, terrain avoidance, weather data, etc. Crucial component for Next Generation Air Transportation System.	Unknown

RUNWAY 9 27		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Airfield Lighting Control Change control sequence and/or facility directory note for MIRLs to be preset on low intensity with higher intensity activated on CTAF.	Provides visibilty of landing environment during night and adverse weather conditions even during times of aircraft equipment failure or pilot control system malfunction.	Less than $10,000

RUNWAY 9		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Runway End Identifier Lights Install REILs for Runway 9.	Improves pilot's ability to detect the landing environment.	$50,000
Precision Approach Path Indicator Install 4-box PAPI for Runway 9.	Provides visual vertical descent guidance information during the approach to the runway.	$70,000

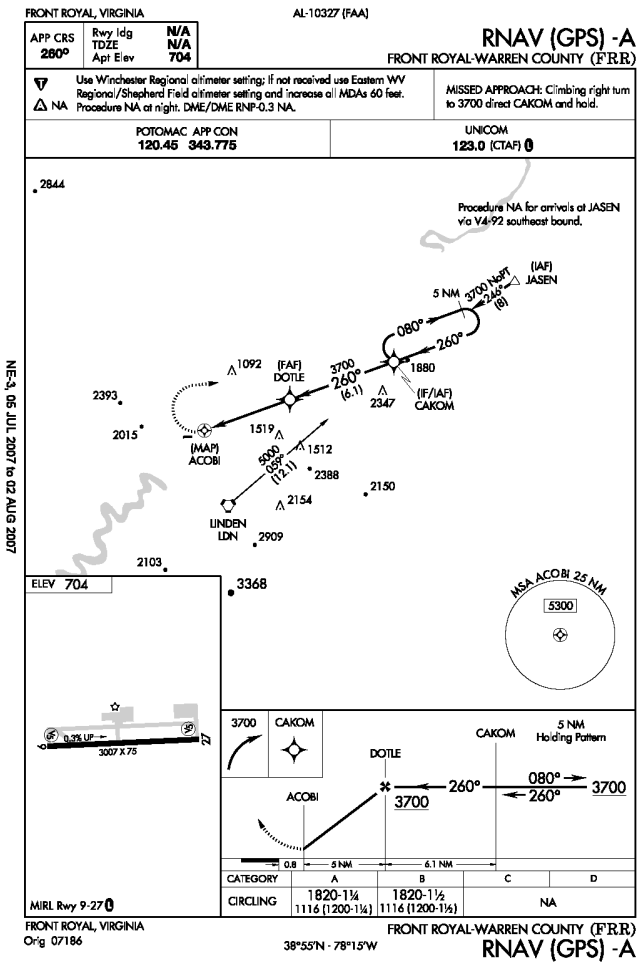
Overall Recommendations

RUNWAY 27		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Runway End Identifier Lights Install REILs for Runway 27.	Improves pilot's ability to detect the landing environment.	$50,000
Precision Approach Path Indicator Install 4-box PAPI for Runway 27.	Provides visual vertical descent guidance information during the approach to the runway.	$70,000
Aeronautical Survey Request / complete aeronautical survey to enable development of LP or LPV and LNAV approaches to Runway 27.	Provides survey data for instrument approach procedures.	$50,000
New Procedure Request development of RNAV (GPS) RWY 27 Approach with LP or LPV and LNAV landing minimums. Due to terrain, may be circle-to-land procedure.	Improve all-weather capability of the runway and airport.	No equipment cost

Front Royal-Warren County (FRR)

Front Royal, Virginia

Procedure Overview



RNAV (GPS) -A

FAA PROCEDURE DATA		
Critical Obstacle:	1519	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:	37	
Accuracy Code Adjustment:		
Other Adjustment:	-12	**see note 2**
Rounding Adjustment:	26	
Minimum Descent Altitude / Decision Height:	1820	

Note 1: AAO

Note 2: missed approach segment, secondary area adjustment

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	CIRCLING	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Recommended	None
Minimum Runway Length	3,200 ft	Yes
Runway Markings	Visual (Basic)	None
Holding Position Signs and Markings	Visual (Basic)	None
Runway Edge Lights	MIRL / LIRL (for night minima only)	None
Parallel Taxiway	Recommended	None
Approach Lights	Not Required	Yes
Runway Design Standards	Not Required	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-2, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Recommendations

RNAV (GPS) A		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Critical Obstacle Confirm and remove close-in obstructions.	Reduces Minimum Descent Altitude (MDA).	Varies
Procedure Review Add course arrow and note to airport diagram.	Procedure clarity.	No equipment cost
Altimeter Source Install AWOS-A and request FAA re-evaluation of remote altimeter setting source penalty. See Overall Recommendations.	Minimum Descent Altitude (MDA) may be reduced by 20 to 40 feet by eliminating the remote altimeter setting source (RASS) adjustment.	$25,000 (duplicate)

Gordonsville Municipal (GVE)

Gordonsville, Virginia

AIRPORT INFORMATION	
ROLE / CLASSIFICATION INFORMATION	
VATSP Classfication (2008):	Local Service
NPIAS Role (2008):	n/a
Study Classification:	Local Service

ACTIVITY INFORMATION	
Based Aircraft (2007):	12
Annual Operations (2020):	13337
Annual Enplanements (2020):	n/a

DEVELOPMENT INFORMATION (2008)	
Critical Airport Reference Code (Existing):	n/a
Critical Airport Reference Code (Proposed):	n/a
Airport Layout Plan (Original):	n/a
Airport Layout Plan (Revision):	n/a
Proposed Development (from ALD):	

AERONAUTICAL SURVEY INFORMATION

Runway End	Survey Type	Survey Date
all	Photoslope	2006

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS	
Available Weather Reporting:	None
Common Traffic Advisory Frequency:	123.0
Clearance Delivery:	Phone
Nearby Navigational Aids:	GORDONSVILLE VORTAC 115.6 GVE 002°/ 8.6 NW TO FIELD

Gordonsville Municipal (GVE)

Gordonsville, Virginia

REVIEWER COMMENTS

No published instrument approach procedures.

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 5 23 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	ALD Not Available	ALD Not Available
Runway Dimensions (Length x Width in ft):	ALD Not Available	ALD Not Available
Runway to Taxiway Separation (feet):	ALD Not Available	ALD Not Available
Runway Lighting:	ALD Not Available	ALD Not Available
RUNWAY 5		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	ALD Not Available	ALD Not Available
Runway Markings:	ALD Not Available	ALD Not Available
Available Visual Approach Aids:	ALD Not Available	ALD Not Available
RUNWAY 23		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	ALD Not Available	ALD Not Available
Runway Markings:	ALD Not Available	ALD Not Available
Available Visual Approach Aids:	ALD Not Available	ALD Not Available

Grundy Municipal (GDY)

Grundy, Virginia

AIRPORT INFORMATION	
ROLE / CLASSIFICATION INFORMATION	
VATSP Classfication (2008):	Local Service
NPIAS Role (2008):	General Aviation
Study Classification:	Local Service

ACTIVITY INFORMATION	
Based Aircraft (2007):	
Annual Operations (2020):	4993
Annual Enplanements (2020):	n/a
DEVELOPMENT INFORMATION (2008)	
Critical Airport Reference Code (Existing):	B-I
Critical Airport Reference Code (Proposed):	B-I
Airport Layout Plan (Original):	June, 1997
Airport Layout Plan (Revision):	n/a

Proposed Development (from ALD):

- Construct terminal facilities

AERONAUTICAL SURVEY INFORMATION

Runway End	Survey Type	Survey Date
all	Photoslope	2001

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS	
Available Weather Reporting:	None
Common Traffic Advisory Frequency:	123.0
Clearance Delivery:	Phone

Nearby Navigational Aids:	GLADE SPRING	VOR/DME	110.2	GZG	357°/ 24.5 NW TO FIELD

Grundy Municipal (GDY)

Grundy, Virginia

Instrument Approach Procedure Summary

Minimums listed are Category B

EXISTING PROCEDURES		
RUNWAY 22		
GPS RWY 22	2720 - 1 (416)	Orig

VISIBILITY CHANGES PROPOSED AS PART OF STUDY	
none	

REVIEWER COMMENTS

none

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 4 22 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	B-I	B-I
Runway Dimensions (Length x Width in ft):	2256 x 60	2256 x 60
Runway to Taxiway Separation (feet):	none	none
Runway Lighting:	MIRL	MIRL
RUNWAY 4		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	250 x 450 x 1000	250 x 450 x 1000
Runway Markings:	Visual	Visual
Available Visual Approach Aids:	APAP	PAPI; REILs
RUNWAY 22		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	250 x 450 x 1000	250 x 450 x 1000
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	APAP	PAPI; REILs

Overall Recommendations

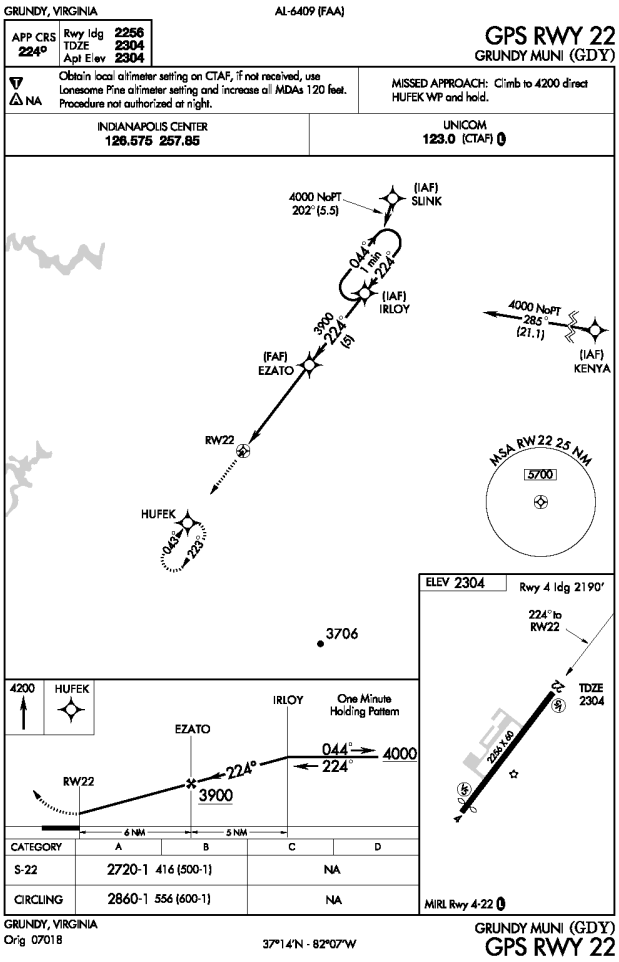
GENERAL		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Altimeter Source Install AWOS-A.	Provides local altimeter source.	$25,000

RUNWAY 4 22		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Airfield Lighting Control Change control sequence and/or facility directory note for MIRLs to be preset on low intensity with higher intensity activated on CTAF.	Provides visibilty of landing environment during night and adverse weather conditions even during times of aircraft equipment failure or pilot control system malfunction.	Less than $10,000

Grundy Municipal (GDY)

Grundy, Virginia

Procedure Overview



GPS RWY 22

FAA PROCEDURE DATA		
Critical Obstacle:	2469	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	1	
Minimum Descent Altitude / Decision Height:	2720	

Note 1: 100' Tree 2C

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	Yes
Runway Markings	Nonprecision	Yes
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	Yes
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	Yes
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Recommendations

GPS RWY 22		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Procedure Review Request procedure title be updated to RNAV (GPS) RWY 22 format.	Procedure clarity.	No equipment cost

Hampton Roads Executive (PVG)

Norfolk, Virginia

AIRPORT INFORMATION	
ROLE / CLASSIFICATION INFORMATION	
VATSP Classfication (2008):	Reliever
NPIAS Role (2008):	Reliever
Study Classification:	Reliever

ACTIVITY INFORMATION	
Based Aircraft (2007):	221
Annual Operations (2020):	72399
Annual Enplanements (2020):	n/a

DEVELOPMENT INFORMATION (2008)	
Critical Airport Reference Code (Existing):	B-II
Critical Airport Reference Code (Proposed):	C-II
Airport Layout Plan (Original):	January, 2006
Airport Layout Plan (Revision):	n/a

Proposed Development (from ALD):
- Offset RWY 10-28 and extend 1294'
- Upgrade RWY 10-28 to C-II
- Construct parallel taxiway (RWY 10-28)
- Install ILS (RWY 10)
- Install MALSR (RWY 10)

AERONAUTICAL SURVEY INFORMATION

Runway End	Survey Type	Survey Date
all	Photoslope	2006

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS	
Available Weather Reporting:	AWOS-III
Common Traffic Advisory Frequency:	123.0
Clearance Delivery:	Phone

Nearby Navigational Aids:

WALEY	NDB	249	RK	052°/ 14.5 NM TO FIELD
PORTSMOUTH	NDB	241	PVG	AT FIELD
NORFOLK	VORTAC	116.9	ORF	248°/ 13.7 NM TO FIELD
FRANKLIN	VORTAC	110.6	FKN	091°/ 27.4 NM TO FIELD
CHESI	NDB	233	EY	352°/ 11.3 NM TO FIELD

Hampton Roads Executive (PVG)

Norfolk, Virginia

Instrument Approach Procedure Summary

Minimums listed are Category B

EXISTING PROCEDURES		
RUNWAY 10		
GPS RWY 10	400 - 1 (380)	Orig A
RUNWAY 2		
NDB OR GPS RWY 2	580 - 1 (559)	Amdt 6B
RUNWAY 28		
GPS RWY 28	820 - 1 (800)	Orig A

PROCEDURES PROPOSED AS PART OF STUDY
ILS RWY 10 (new runway)
LOC RWY 10 (existing runway)
RNAV (GPS) RWY 10 - LPV
RNAV (GPS) RWY 2 - LNAV
RNAV (GPS) RWY 20 - LNAV or LP
RNAV (GPS) RWY 28 - LPV

VISIBILITY CHANGES PROPOSED AS PART OF STUDY	
RUNWAY 10:	1 SM to 1/2 SM
RUNWAY 28:	1 SM to 3/4 SM

REVIEWER COMMENTS

Many of recommended improvements are not expected to be incorporated into existing runway. New Runway should include MALSR & PAPI and have ILS (w/DME) and LPV minimums. Do not anticipate accepting visibility credit on existing runway. The Study recommends a reduction in landing visibility minimums. Additional information regarding the estimated impacts and costs associated with the visibility changes is included in Appendix E. The Airport Sponsor completed the requested informational survey.

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 10 28 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	B-II	C-II
Runway Dimensions (Length x Width in ft):	4056 x 70	5350 x 100
Runway to Taxiway Separation (feet):	123	400
Runway Lighting:	MIRL	HIRL
RUNWAY 10		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 700 x 1000	1000 x 1750 x 2500
Runway Markings:	Visual	Precision
Available Visual Approach Aids:	APAP	PAPI; MALSR
RUNWAY 28		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 700 x 1000	500 x 1010 x 1700
Runway Markings:	Visual	Non-Precision
Available Visual Approach Aids:	APAP	PAPI; REILs
RUNWAY 2 20 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	B-II (small)	B-II (small)
Runway Dimensions (Length x Width in ft):	3524 x 70	3524 x 70
Runway to Taxiway Separation (feet):	240	240
Runway Lighting:	MIRL	MIRL
RUNWAY 2		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	250 x 450 x 1000	250 x 450 x 1000
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	none	PAPI
RUNWAY 20		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	250 x 450 x 1000	250 x 450 x 1000
Runway Markings:	Non-Precision	Visual
Available Visual Approach Aids:	none	PAPI

Hampton Roads Executive (PVG)

Norfolk, Virginia

System Benchmarks

Reliever			
Best Approach (Primary Runway End)			
BENCHMARK		**RUNWAY 10**	
Approach:	ILS CAT I	☐ meets	n/a (no ground-based approach available)
Ceiling:	200 AGL	☐ meets	
Visibility:	1/2 statute mile	☐ meets	
Approach:	LPV	☐ meets	GPS RWY 10
Ceiling:	200 AGL	☐ meets	
Visibility:	1/2 statute mile	☐ meets	
Equipment:	MALSR, HIRLs, PAPI	☐ meets	
Secondary Approach (Different Runway End)			
BENCHMARK		**RUNWAY 28**	
Approach:	Ground-based	☐ meets	n/a (no ground-based approach available)
Ceiling:	400 AGL	☐ meets	
Visibility:	3/4 staute mile	☐ meets	
Approach:	LPV	☐ meets	GPS RWY 28
Ceiling:	250 AGL	☐ meets	
Visibility:	3/4 statute mile	☐ meets	
Equipment:	MALS, HIRLs, PAPI	☐ meets	
All Ends of Instrument Runways			
BENCHMARK		**RUNWAY 20**	
Approach:	none	☐ meets	n/a (no ground-based approach available)
Ceiling:		☐ meets	
Visibility:		☐ meets	
Approach:	LNAV	☐ meets	n/a (no satellite-based approach available)
Ceiling:	400 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Equipment:	REILs, MIRLs, PAPI	☐ meets	existing MIRL

Hampton Roads Executive (PVG)

Norfolk, Virginia

BENCHMARK		RUNWAY 2	
Approach:	none	☐ meets	NDB OR GPS RWY 2
Ceiling:		☐ meets	
Visibility:		☐ meets	
Approach:	LNAV	☐ meets	NDB OR GPS RWY 2
Ceiling:	400 AGL	☐ meets	
Visibility:	1 statute mile	☑ meets	
Equipment:	REILs, MIRLs, PAPI	☐ meets	existing MIRL

Weather:	on-field, 24/7, data-linked	☐ meets	
Access to ATC Clearance:	RTR	☐ meets	
ADS-B Coverage:	On ground	☐ meets	

Overall Recommendations

GENERAL		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Weather Reporting Connect existing AWOS-III to NADIN system.	Improve availability / accessibility of weather information.	$5,000
Weather Reporting Upgrade existing AWOS-III to include present weather, lightning and freezing rain sensor.	Improves information available to pilot.	$60,000
Communications Install a Remote Transmitter / Receiver (RTR) directly with Norfolk Approach.	Provides direct communication with approach control via radio and an "on-demand" telephone land line link. Used by aircraft on ground for obtaining or canceling IFR clearances.	$40,000
Communications Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	Improves pilot/controller communications and clearance delivery process.	Less than $5,000
Data link Provide ADS-B coverage while on the ground.	Provides traffic surveillance, terrain avoidance, weather data, etc. Crucial component for Next Generation Air Transportation System.	$100,000
Local Area Augmentation System (LAAS) Provide LAAS coverage to augment existing global positioning system.	Provides enhanced signal accuracy.	Unknown

RUNWAY 10 28		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Airfield Lighting Control Change control sequence and/or facility directory note for MIRLs to be preset on low intensity with higher intensity activated on CTAF.	Provides visibilty of landing environment during night and adverse weather conditions even during times of aircraft equipment failure or pilot control system malfunction.	Less than $10,000
Runway Lighting Replace Medium Intensity Runway Lights (MIRLs) with High Intensity Runway Lights (HIRLs).	Improves pilot's ability to detect the runway environment.	$300,000

Overall Recommendations

RUNWAY 2		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions.	Standards.	Varies
Runway End Identifier Lights Install REILs for Runway 2.	Improves pilot's ability to detect the landing environment.	$50,000
Precision Approach Path Indicator Install 4-box PAPI for Runway 2.	Provides visual vertical descent guidance information during the approach to the runway.	$70,000
Aeronautical Survey Request / complete aeronautical survey to enable development of LNAV approach to Runway 2.	Provides survey data for instrument approach procedures.	$50,000

RUNWAY 20		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Runway End Identifier Lights Install REILs for Runway 20.	Improves pilot's ability to detect the landing environment.	$50,000
Precision Approach Path Indicator Install 4-box PAPI for Runway 20.	Provides visual vertical descent guidance information during the approach to the runway.	$70,000
Aeronautical Survey Request / complete aeronautical survey to enable development of LNAV and LP approaches to Runway 20.	Provides survey data for instrument approach procedures.	$50,000 (duplicate)
New Procedure Request development of RNAV (GPS) RWY 20 approach with LNAV and LP landing minimums.		No equipment cost

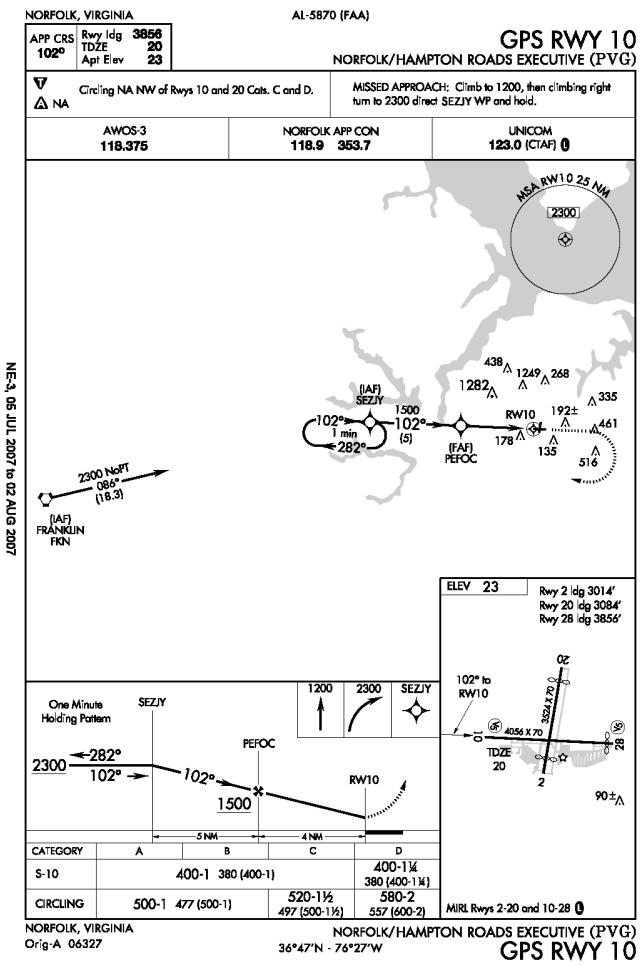
Overall Recommendations

RUNWAY 10		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions.	Standards.	Varies
Runway End Identifier Lights Install REILs for Runway 10.	Improves pilot's ability to detect the landing environment.	$50,000
Precision Approach Path Indicator Install 4-box PAPI for Runway 10.	Provides visual vertical descent guidance information during the approach to the runway.	$70,000
Approach Lighting System Install MALSR for Runway 10 (new runway only).	Improves pilot's ability to detect the landing environment.	$800,000
Aeronautical Survey Request / complete aeronautical survey to enable development of ILS and LPV approach to Runway 10.	Provides survey data for instrument approach procedures.	$50,000 (duplicate)
New Procedure Request development of ILS RWY 10 approach. May elect to implement localizer portion only for existing runway.	Provides a precision, straight-in, ground-based approach. Localizer minimums may be as low as 380-1 (360) or a reduction of 20 feet.	$800,000
New Procedure Request development of RNAV (GPS) RWY 10 Approach with LPV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost

Overall Recommendations

RUNWAY 28		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions (tree).	Standards.	Varies
Runway End Identifier Lights Install REILs for Runway 28 (existing runway).	Improves pilot's ability to detect the landing environment.	$50,000
Precision Approach Path Indicator Install 4-box PAPI for Runway 28.	Provides visual vertical descent guidance information during the approach to the runway.	$70,000
Approach Lighting System Install MALS for Runway 28 (new runway only).	Improves pilot's ability to detect the landing environment.	$400,000
Aeronautical Survey Request / complete aeronautical survey to enable development of LPV approaches to Runway 28.	Provides survey data for instrument approach procedures.	$50,000 (duplicate)
New Procedure Request development of RNAV (GPS) RWY 28 Approach with LPV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost
Visibility Minimums Upon installation of approach lighting system and subsequent acceptance of visibility credit, different design standards apply (less than 1 mile).	Lower landing visibility minimum.	$600,000

Procedure Overview



GPS RWY 10

FAA PROCEDURE DATA	
Critical Obstacle:	**see note 1**
Required Obstacle Clearance:	
Remote Altimeter Adjustment:	
Accuracy Code Adjustment:	
Other Adjustment:	**see note 2**
Rounding Adjustment:	
Minimum Descent Altitude / Decision Height:	400

Note 1:

Note 2:

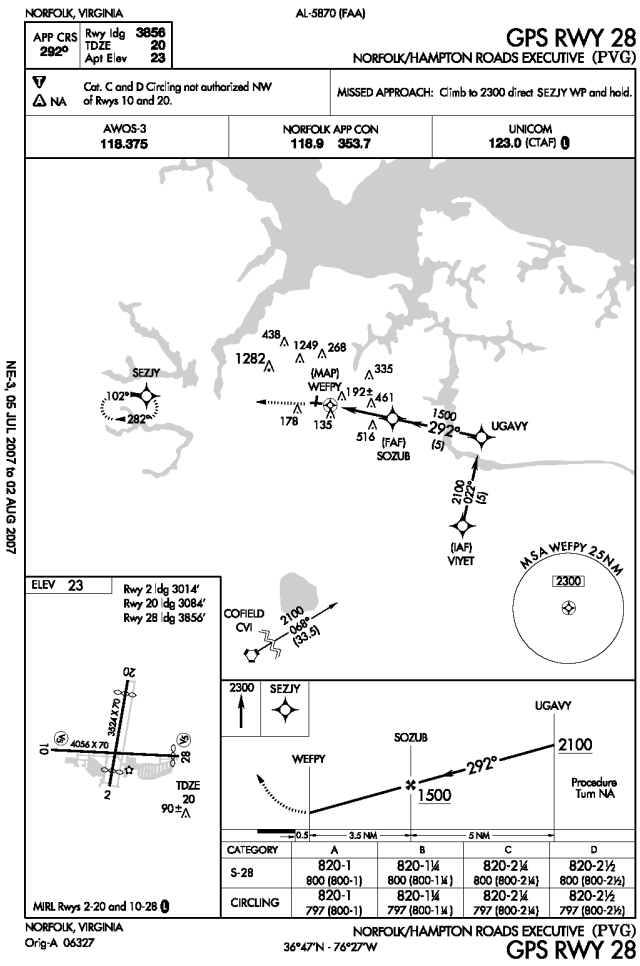
Note 3: Rec'd a copy of the more recent published Form 8260 RNAV(GPS) RWY 10 Aug 30, 2007 - MDA 440 instead of 400

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	Yes
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Overview



GPS RWY 28

FAA PROCEDURE DATA		
Critical Obstacle:	516	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:	50	
Other Adjustment:		**see note 2**
Rounding Adjustment:	4	
Minimum Descent Altitude / Decision Height:	820	

Note 1: Tower (47-0205)

Note 2:

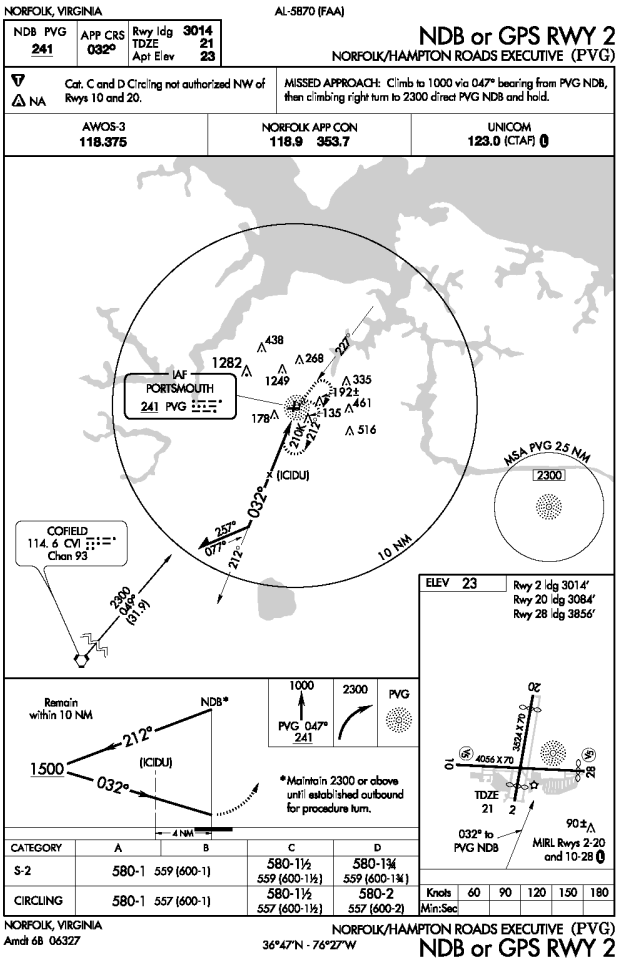
Note 3: Rec'd a copy of the more recent published Form 8260 RNAV(GPS) RWY 28 Aug 30, 2007 - MDA is the same

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	Yes
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Overview



NDB OR GPS RWY 2

FAA PROCEDURE DATA		
Critical Obstacle:	178	**see note 1**
Required Obstacle Clearance:	350	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:	52	**see note 2**
Rounding Adjustment:	0	
Minimum Descent Altitude / Decision Height:	580	

Note 1: Tower (47-1583)

Note 2: XP

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Recommendations

PROPOSED IMPROVEMENT	EXPECTED BENEFIT	ASSOCIATED COST
Distance Measuring Equipment Install Distance Measuring Equipment (DME) in conjunction with localizer.	Improves pilot's situational awareness and simplifies procedure.	$100,000
GPS RWY 10		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Procedure Review Request procedure title be updated to RNAV (GPS) RWY 10 format.	Procedure clarity.	No equipment cost
GPS RWY 28		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Procedure Review Request procedure title be updated to RNAV (GPS) RWY 28 format.	Procedure clarity.	No equipment cost

Procedure Recommendations

NDB or GPS RWY 2		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Procedure Review Request procedure be updated to separate GPS approach from ground-based approach.	Procedure clarity.	No equipment cost
Procedure Review Cancel procedure when ILS (or LOC) RWY 10 procedure is published.	Allows decommissioning of NDB.	No equipment cost

Hanover County Municipal (OFP)

Richmond/Ashland, Virginia

AIRPORT INFORMATION	
ROLE / CLASSIFICATION INFORMATION	
VATSP Classfication (2008):	Reliever
NPIAS Role (2008):	General Aviation
Study Classification:	Reliever

ACTIVITY INFORMATION	
Based Aircraft (2007):	117
Annual Operations (2020):	41116
Annual Enplanements (2020):	n/a
DEVELOPMENT INFORMATION (2008)	
Critical Airport Reference Code (Existing):	B-II
Critical Airport Reference Code (Proposed):	B-II
Airport Layout Plan (Original):	n/a
Airport Layout Plan (Revision):	March, 2006

Proposed Development (from ALD):
- Upgrade RWY 16 RPZ
- Install ODALS (RWY 16)

AERONAUTICAL SURVEY INFORMATION

Runway End	Survey Type	Survey Date
all	Photoslope	2007
34	ANA-LPV	2006
16	ANA-LPV	2006

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS	
Available Weather Reporting:	ASOS
Common Traffic Advisory Frequency:	122.7
Clearance Delivery:	RTR

Nearby Navigational Aids:

RICHMOND	VORTAC	114.1	RIC	345°/ 13.6 NM TO FIELD
HOPEWELL	VORTAC	112	HPW	332°/ 27.4 NM TO FIELD
FLAT ROCK	VORTAC	113.3	FAK	066°/ 21.5 NM TO FIELD
ASHEY	NDB	280	LJK	161°/ 4.4 NM TO FIELD

Hanover County Municipal (OFP)

Richmond/Ashland, Virginia

Instrument Approach Procedure Summary

Minimums listed are Category B

EXISTING PROCEDURES		
RUNWAY 16		
GPS RWY 16	680 - 1 (475)	Amdt 1B
LOC RWY 16	680 - 1 (475)	Amdt 2A
VOR RWY 16	680 - 1 (475)	Amdt 2

PROCEDURES PROPOSED AS PART OF STUDY
ILS or LOC RWY 16 - ILS
RNAV (GPS) RWY 16 - LPV
RNAV (GPS) RWY 34 - LNAV
RNAV (GPS) RWY 34 - LPV
VOR RWY 34

VISIBILITY CHANGES PROPOSED AS PART OF STUDY	
RUNWAY 16:	1 SM to 1/2 SM
RUNWAY 34:	1 SM to 3/4 SM

REVIEWER COMMENTS

ALD shows Runway 16 with 3/4 sm visibility and Runway 34 with 1 sm visibility. Study recommends Runway 16 with 1/2 sm and Runway 34 with 3/4 sm visibility minimums. Additional information regarding the estimated impacts and costs associated with the visibility changes is included in Appendix E. ALD does not show precision approach during the planning period. ILS visibility minimums below 3/4 sm will require a shift of the taxiway or runway centerline of 20.5 feet to meet current design standards. The Airport Sponsor completed the requested informational survey.

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 16 34 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	B-II	B-II
Runway Dimensions (Length x Width in ft):	5402 x 100	5402 x 100
Runway to Taxiway Separation (feet):	279.5	279.5
Runway Lighting:	MIRL	MIRL
RUNWAY 16		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 700 x 1000	1000 x 1510 x 1700
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	PAPI; REILs	PAPI; ODALS
RUNWAY 34		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 700 x 1000	500 x 700 x 1000
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	PAPI; REILs	PAPI; REILs

Hanover County Municipal (OFP)

Richmond/Ashland, Virginia

System Benchmarks

Reliever			
Best Approach (Primary Runway End)			
BENCHMARK		**RUNWAY 16**	
Approach:	ILS CAT I	☐ meets	LOC RWY 16
Ceiling:	200 AGL	☐ meets	
Visibility:	1/2 statute mile	☐ meets	
Approach:	LPV	☐ meets	GPS RWY 16
Ceiling:	200 AGL	☐ meets	
Visibility:	1/2 statute mile	☐ meets	
Equipment:	MALSR, HIRLs, PAPI	☐ meets	existing PAPI
Secondary Approach (Different Runway End)			
BENCHMARK		**RUNWAY 34**	
Approach:	Ground-based	☐ meets	n/a (no ground-based approach available)
Ceiling:	400 AGL	☐ meets	
Visibility:	3/4 staute mile	☐ meets	
Approach:	LPV	☐ meets	n/a (no satellite-based approach available)
Ceiling:	250 AGL	☐ meets	
Visibility:	3/4 statute mile	☐ meets	
Equipment:	MALS, HIRLs, PAPI	☐ meets	

Additional Requirements			
Weather:	on-field, 24/7, data-linked	☑ meets	
Access to ATC Clearance:	RTR	☑ meets	
ADS-B Coverage:	On ground	☐ meets	

Overall Recommendations

GENERAL		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Weather Reporting Upgrade existing AWOS-III to include lightning and freezing rain sensor.	Improves information available to pilot.	$60,000
Communications Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	Improves pilot/controller communications and clearance delivery process.	Less than $5,000
Data link Provide ADS-B coverage while on the ground.	Provides traffic surveillance, terrain avoidance, weather data, etc. Crucial component for Next Generation Air Transportation System.	$100,000
Local Area Augmentation System (LAAS) Provide LAAS coverage to augment existing global positioning system.	Provides enhanced signal accuracy.	Unknown

RUNWAY 16 34		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Airfield Lighting Control Change control sequence and/or facility directory note for MIRLs to be preset on low intensity with higher intensity activated on CTAF.	Provides visibilty of landing environment during night and adverse weather conditions even during times of aircraft equipment failure or pilot control system malfunction.	Less than $10,000
Runway Lighting Replace Medium Intensity Runway Lights (MIRLs) with High Intensity Runway Lights (HIRLs).	Improves pilot's ability to detect the runway environment.	$300,000

Overall Recommendations

RUNWAY 16		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Approach Lighting System Install MALSR for Runway 16.	Improves pilot's ability to detect the landing environment.	$1,050,000
Visibility Minimum Upon installation of approach lighting system and subsequent acceptance of visibility credit (1 sm to 3/4 sm), different design standards apply (less than 1 mile).	Lower landing visibility minimum from 1 statute mile to 3/4 statute mile.	$11,000,000
Visibility Minimum Upon installation of approach lighting system and subsequent acceptance of visibility credit (3/4 sm to 1/2 sm), different design standards apply (less than 1 mile).	Lower landing visibility minimum from 3/4 statute mile to 1/2 statute mile.	$9,000,000
Aeronautical Survey Request / complete aeronautical survey to enable development of LNAV and LPV approaches to Runway 16.	Provides survey data for instrument approach procedures.	Completed 2006
New Procedure Request development of RNAV (GPS) RWY 16 Approach with LPV landing minimums.	Improve all-weather capability of the runway and airport. Provides vertical guidance.	No equipment cost
New Procedure Install glide slope to complete ILS RWY 16.	Improve all-weather capability of the runway and airport.	$800,000

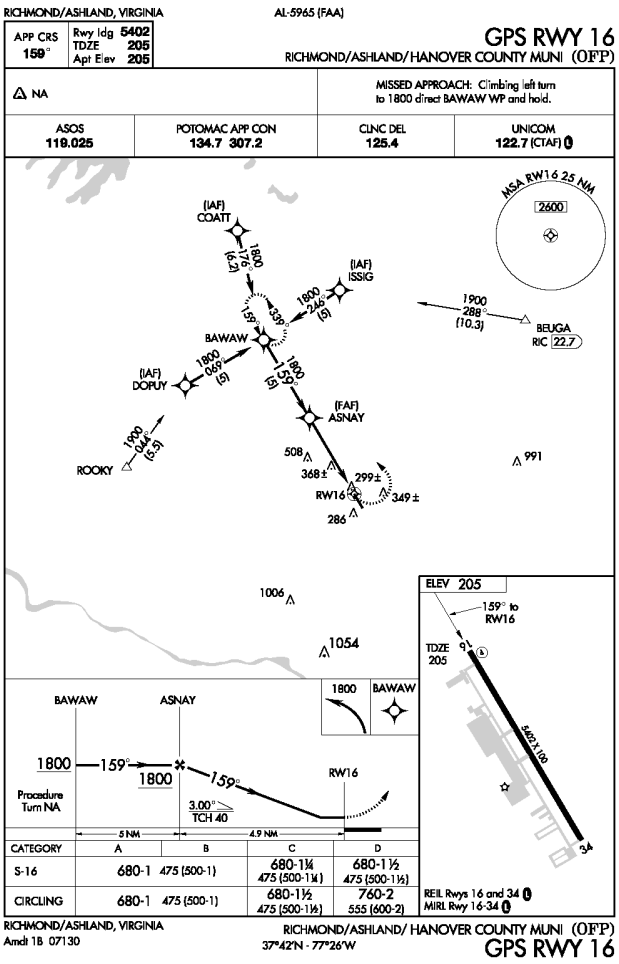
Overall Recommendations

RUNWAY 34		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions.	Standards.	Varies
Precision Approach Path Indicator Install 4-box PAPI for Runway 34.	Provides visual vertical descent guidance information during the approach to the runway.	$70,000
Approach Lighting System Install MALS for Runway 34.	Improves pilot's ability to detect the landing environment.	$400,000
Visibility Minimum Upon installation of approach lighting system and subsequent acceptance of visibility credit, different design standards apply (less than 1 mile).	Lower landing visibility minimum.	$1,400,000
New Procedure Request development of VOR RWY 34 Approach (RIC VORTAC).	Improve all-weather capability of the runway and airport.	No equipment cost
Aeronautical Survey Request / complete aeronautical survey to enable development of LNAV and LPV approaches to Runway 34.	Provides survey data for instrument approach procedures.	Completed 2006
New Procedure Request development of RNAV (GPS) RWY 34 Approach with LPV and LNAV landing minimums.	Improve all-weather capability of the runway and airport and eliminate requirement for circle-to-land operations. LNAV procedure may result in minimums as low as 520-1 (315) or a reduction of 160 feet from current Runway	No equipment cost

Hanover County Municipal (OFP)

Richmond/Ashland, Virginia

Procedure Overview



GPS RWY 16

FAA PROCEDURE DATA		
Critical Obstacle:	423	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	7	
Minimum Descent Altitude / Decision Height:	680	

Note 1: Tower (47-0918)

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

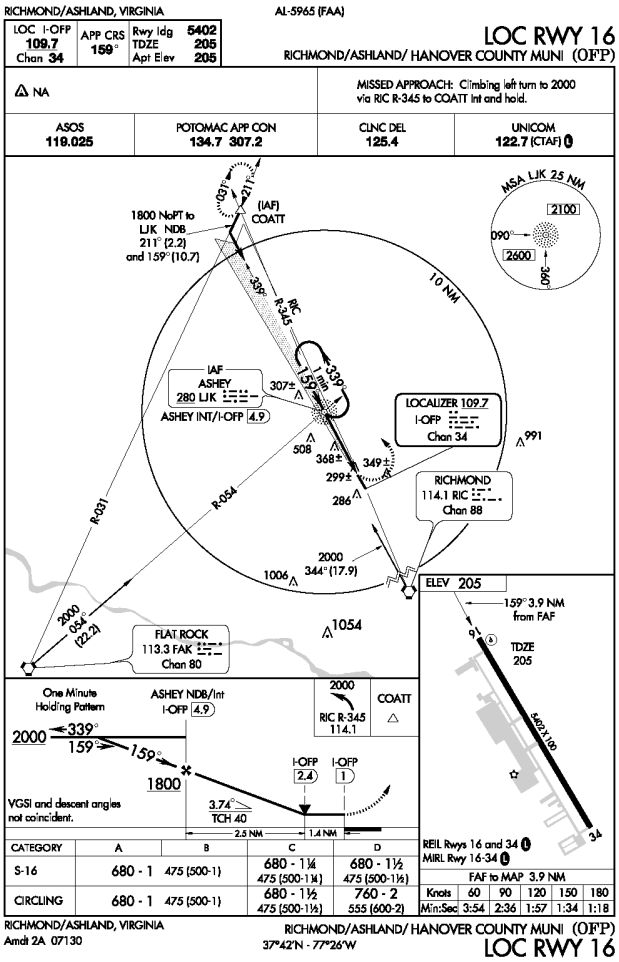
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	Yes
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Hanover County Municipal (OFP)

Richmond/Ashland, Virginia

Procedure Overview



LOC RWY 16

FAA PROCEDURE DATA		
Critical Obstacle:	423	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	7	
Minimum Descent Altitude / Decision Height:	680	

Note 1: TWR (47-0918)

Note 2:

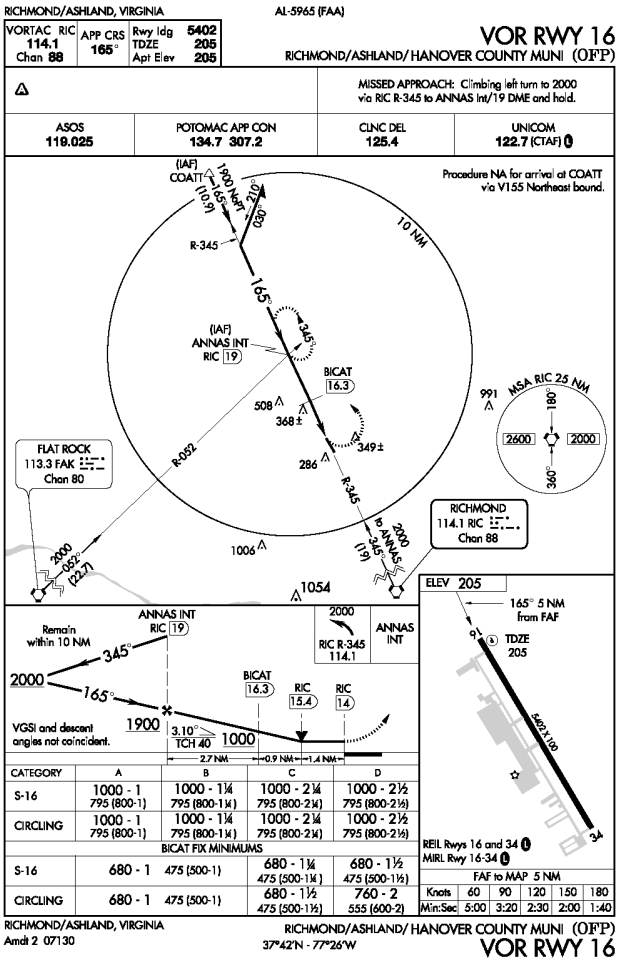
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	1 SM	**KNOWN DEFICIENCIES**
	REQUIRED	
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	Yes
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Hanover County Municipal (OFP)

Richmond/Ashland, Virginia

Procedure Overview



VOR RWY 16

FAA PROCEDURE DATA		
Critical Obstacle:	423	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	7	
Minimum Descent Altitude / Decision Height:	680	

Note 1: Tower (47-0918)

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	1 SM	**KNOWN DEFICIENCIES**
	REQUIRED	
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	Yes
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Recommendations

GPS RWY 16		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Procedure Review Request procedure title be updated to RNAV (GPS) RWY 16 format.	Procedure clarity.	No equipment cost

LOC RWY 16		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Visibility Minimum Upon installation of approach lighting system, request procedure be updated to 3/4 statute mile visibility (1/2 statute mile with ILS approach).	Lower landing visibility minimum.	See Overall Recommendations
New Procedure Install glide slope to complete ILS RWY 16. See Overall Recommendations.	Improve all-weather capability of the runway and airport.	See Overall Recommendations
Facility Replacement Replace problematic DME.	Improves reliability.	$100,000

VOR RWY 16		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a

Hummel Field (W75)

Saluda, Virginia

AIRPORT INFORMATION	
ROLE / CLASSIFICATION INFORMATION	
VATSP Classfication (2008):	Local Service
NPIAS Role (2008):	n/a
Study Classification:	Local Service

ACTIVITY INFORMATION	
Based Aircraft (2007):	64
Annual Operations (2020):	23861
Annual Enplanements (2020):	n/a
DEVELOPMENT INFORMATION (2008)	
Critical Airport Reference Code (Existing):	A-I
Critical Airport Reference Code (Proposed):	A-I
Airport Layout Plan (Original):	May, 2005
Airport Layout Plan (Revision):	n/a

Proposed Development (from ALD):

- Construct parallel taxiway

AERONAUTICAL SURVEY INFORMATION

Runway End	Survey Type	Survey Date
all	Photoslope	2007

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS	
Available Weather Reporting:	None
Common Traffic Advisory Frequency:	123.0
Clearance Delivery:	Phone

Nearby Navigational Aids:

HARCUM	VORTAC	108.8	HCM	061°/ 15.6 NM TO FIELD
CAPE CHARLES	VORTAC	112.2	CCV	316°/ 26.3 NM TO FIELD

Hummel Field (W75)

Saluda, Virginia

Instrument Approach Procedure Summary

Minimums listed are Category B

EXISTING PROCEDURES		
RUNWAY 1		
GPS RWY 1	520 - 1 (490)	Orig A

VISIBILITY CHANGES PROPOSED AS PART OF STUDY	
none	

REVIEWER COMMENTS

none

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 1 19 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	A-I	A-I
Runway Dimensions (Length x Width in ft):	2270 x 45	2271 x 50
Runway to Taxiway Separation (feet):	none	150
Runway Lighting:	MIRL	MIRL
RUNWAY 1		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	250 x 450 x 1000	250 x 450 x 1000
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	APAP	PAPI
RUNWAY 19		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	250 x 450 x 1000	250 x 450 x 1000
Runway Markings:	Visual	Visual
Available Visual Approach Aids:	APAP	PAPI

Overall Recommendations

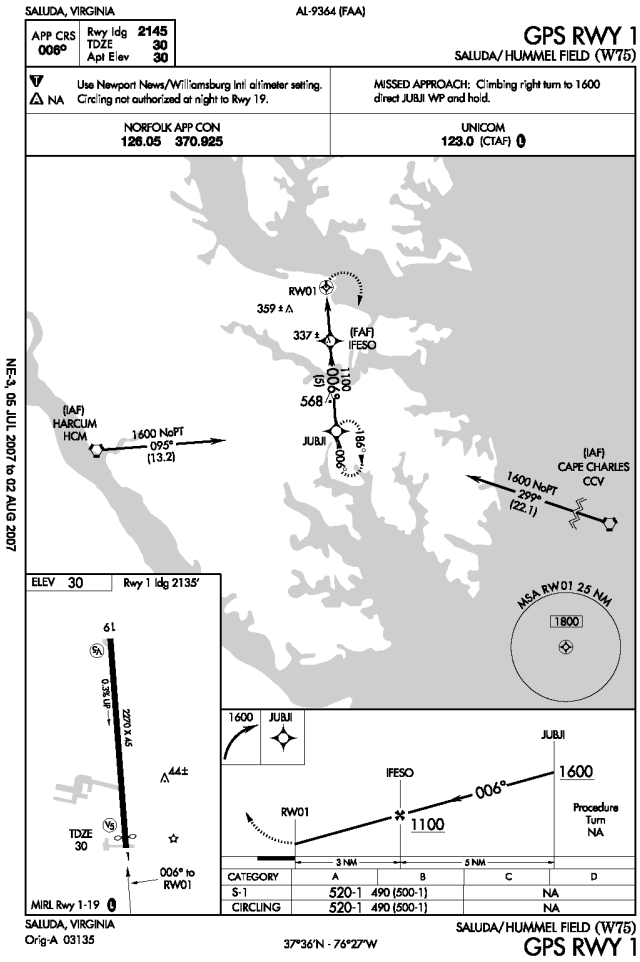
GENERAL		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Altimeter Source Install AWOS-A.	Provides local altimeter source.	$25,000

RUNWAY 1 19		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Airfield Lighting Control Change control sequence and/or facility directory note for MIRLs to be preset on low intensity with higher intensity activated on CTAF.	Provides visibilty of landing environment during night and adverse weather conditions even during times of aircraft equipment failure or pilot control system malfunction.	Less than $10,000

RUNWAY 1		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions.	Standards.	Varies
Precision Approach Path Indicator Install 4-box PAPI for Runway 1.	Provides visual vertical descent guidance information during the approach to the runway.	$70,000

RUNWAY 19		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions.	Standards.	Varies
Precision Approach Path Indicator Install 4-box PAPI for Runway 19.	Provides visual vertical descent guidance information during the approach to the runway.	$70,000

Procedure Overview



GPS RWY 1

FAA PROCEDURE DATA		
Critical Obstacle:	189	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:	67	
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	14	
Minimum Descent Altitude / Decision Height:	520	

Note 1: 100' Tree

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	Yes
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	Yes
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	Yes
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	Yes
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	Yes
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Recommendations

GPS RWY 1		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Procedure Review Request procedure title be updated to RNAV (GPS) RWY 1 format.	Procedure clarity.	No equipment cost
Altimeter Source Install AWOS-A and request FAA re-evaluation of remote altimeter setting source penalty. See Overall Recommendations.	Minimum Descent Altitude (MDA) may be reduced by 60 to 80 feet by eliminating the remote altimeter setting source (RASS) adjustment.	$25,000 (duplicate)

Ingalls Field (HSP)

Hot Springs, Virginia

AIRPORT INFORMATION	
ROLE / CLASSIFICATION INFORMATION	
VATSP Classfication (2008):	General Aviation Regional
NPIAS Role (2008):	General Aviation
Study Classification:	General Aviation Regional (3/4 mile visibility)

ACTIVITY INFORMATION	
Based Aircraft (2007):	4
Annual Operations (2020):	8827
Annual Enplanements (2020):	n/a

DEVELOPMENT INFORMATION (2008)	
Critical Airport Reference Code (Existing):	B-II
Critical Airport Reference Code (Proposed):	B-II
Airport Layout Plan (Original):	March, 1999
Airport Layout Plan (Revision):	December, 2003
Proposed Development (from ALD):	

AERONAUTICAL SURVEY INFORMATION

Runway End	Survey Type	Survey Date
all	Photoslope	2006
all	OC-HSP 5246	1995
24	PIR	1995
6	SUPLC	1995
7	ANA-LPV	underway

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS	
Available Weather Reporting:	AWOS-III
Common Traffic Advisory Frequency:	123.0
Clearance Delivery:	RTR

Nearby Navigational Aids:

GREENBRIER	VOR/DME	116.05	LWB	087°/ 26.9 NM TO FIELD

Ingalls Field (HSP)

Hot Springs, Virginia

Instrument Approach Procedure Summary

Minimums listed are Category B

EXISTING PROCEDURES		
RUNWAY 25		
GPS RWY 25	4440 - 1 (668)	Orig A
ILS RWY 25 - ILS	4087 - 1 (315)	Amdt 3
ILS RWY 25 - LOC	4240 - 1 (468)	Amdt 3
RUNWAY 7		
GPS RWY 7	4600 - 1 (808)	Orig A

PROCEDURES PROPOSED AS PART OF STUDY
RNAV (GPS) RWY 25 - LPV
RNAV (GPS) RWY 7 - LPV

VISIBILITY CHANGES PROPOSED AS PART OF STUDY	
RUNWAY 25:	1 SM to 4000 RVR

REVIEWER COMMENTS

A vertically-guided, satellite-based approach is recommended to meet System Benchmarks. The Study recommends a reduction in landing visibility minimums. An itemized estimate of associated costs is included in Appendix E. The Study recommends a reduction in visibility minimums from 1 mile to 3/4 mile. Additional information regarding the estimated impacts and costs associated with the visibility changes is included in Appendix E.

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 7 25 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	B-II	B-II
Runway Dimensions (Length x Width in ft):	5600 x 100	5600 x 100
Runway to Taxiway Separation (feet):	275	275
Runway Lighting:	HIRL	HIRL
RUNWAY 7		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 X 1010 X 1700	500 X 1010 X 1700
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	PAPI	PAPI; REILs
RUNWAY 25		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 X 1010 X 1700	500 X 1010 X 1700
Runway Markings:	Precision	Precision
Available Visual Approach Aids:	PAPI; REILs	PAPI; REILs

Ingalls Field (HSP)

Hot Springs, Virginia

System Benchmarks

General Aviation Regional (3/4 mile visibility)			
Best Approach (Primary Runway End)			
BENCHMARK		**RUNWAY 25**	
Approach:	Ground-based	☑ meets	ILS RWY 25 - ILS
Ceiling:	400 AGL	☑ meets	
Visibility:	3/4 statute mile	☐ meets	
Approach:	LPV	☐ meets	GPS RWY 25
Ceiling:	250 AGL	☐ meets	
Visibility:	3/4 statute mile	☐ meets	
Equipment:	MALS, HIRLs, PAPI	☐ meets	existing HIRLs, PAPI
Secondary Approach (Different Runway End)			
BENCHMARK		**RUNWAY 7**	
Approach:	Ground-based	☐ meets	n/a (no ground-based approach available)
Ceiling:	400 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Approach:	LPV	☐ meets	GPS RWY 7
Ceiling:	250 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Equipment:	REILs, HIRLs, PAPI	☐ meets	existing HIRLs, PAPI

Additional Requirements			
Weather:	on-field, 24/7, data-linked	☑ meets	
Access to ATC Clearance:	RTR	☑ meets	
ADS-B Coverage:	On ground	☐ meets	

Overall Recommendations

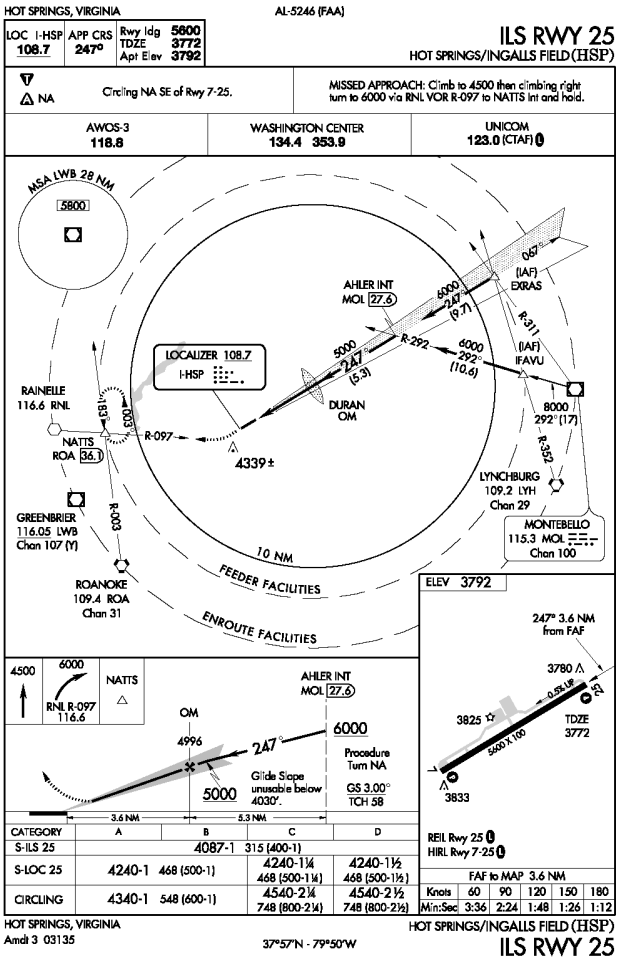
GENERAL		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Weather Reporting Upgrade existing AWOS-III to include present weather, lightning and freezing rain sensor.	Improves information available to pilot.	$60,000
Visibility Minimum Upon installation of the RVR equipment, request procedure be updated to 4000 RVR (in lieu of prevailing visibility).	Lower landing visibilty minimum.	$360,000
Data link Provide ADS-B coverage while on the ground.	Provides traffic surveillance, terrain avoidance, weather data, etc. Crucial component for Next Generation Air Transportation System.	$100,000
Local Area Augmentation System (LAAS) Provide LAAS coverage to augment existing global positioning system.	Provides enhanced signal accuracy.	Unknown
RUNWAY 7 25		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Airfield Lighting Control Change control sequence and/or facility directory note for HIRLs to be preset on low intensity with higher intensity activated on CTAF.	Provides visibilty of landing environment during night and adverse weather conditions even during times of aircraft equipment failure or pilot control system malfunction.	Less than $10,000

Overall Recommendations

RUNWAY 7		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Runway End Identifier Lights Install REILs for Runway 7.	Improves pilot's ability to detect the landing environment.	$50,000
Aeronautical Survey Request / complete aeronautical survey to enable development of LPV approach to Runway 7.	Provides survey data for instrument approach procedures.	Underway
New Procedure Request development of RNAV (GPS) RWY 7 Approach with LPV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost

RUNWAY 25		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Weather Reporting Install Runway Visual Range (RVR) equipment.	Replaces prevailing visibility measurement.	$400,000
Aeronautical Survey Request / complete aeronautical survey to enable development of LNAV and LPV approaches to Runway 25.	Provides survey data for instrument approach procedures.	Completed 1995
New Procedure Request development of RNAV (GPS) RWY 25 Approach with LPV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost

Procedure Overview



ILS RWY 25 - ILS

FAA PROCEDURE DATA	
Critical Obstacle:	**see note 1**
Required Obstacle Clearance:	
Remote Altimeter Adjustment:	
Accuracy Code Adjustment:	
Other Adjustment:	115 **see note 2**
Rounding Adjustment:	
Minimum Descent Altitude / Decision Height:	4087

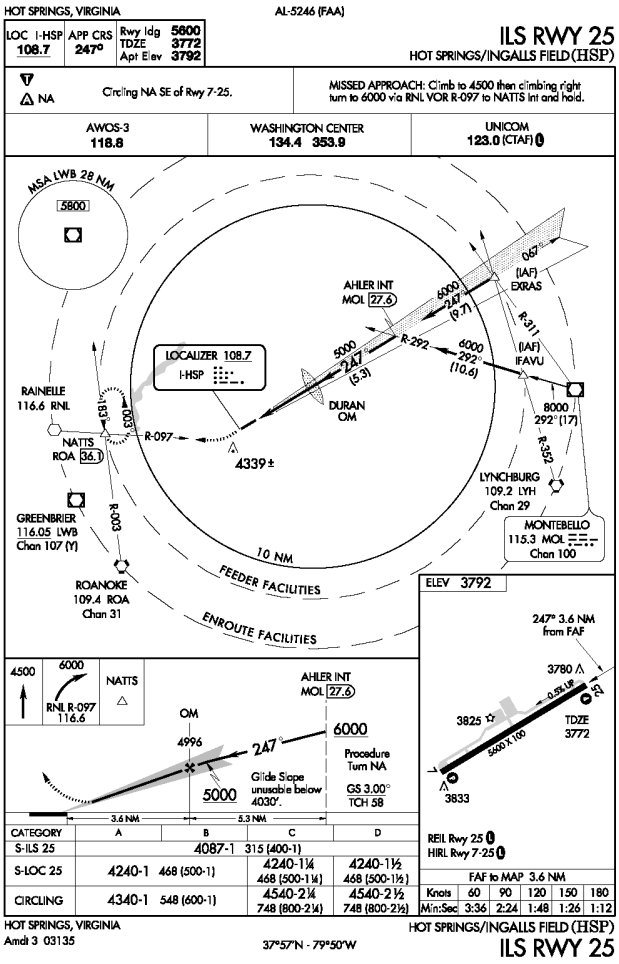
Note 1: ASC

Note 2: pilot request, missed approach segment

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1A - PRECISION INSTRUMENT APPROACH REQUIREMENTS		
	1 SM	**KNOWN DEFICIENCIES**
	REQUIRED	
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	4,200 ft (Paved)	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 8, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Procedure Overview



ILS RWY 25 - LOC

FAA PROCEDURE DATA		
Critical Obstacle:	3784	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:	200	**see note 2**
Rounding Adjustment:	6	
Minimum Descent Altitude / Decision Height:	4240	

Note 1: Tree

Note 2: pilot request

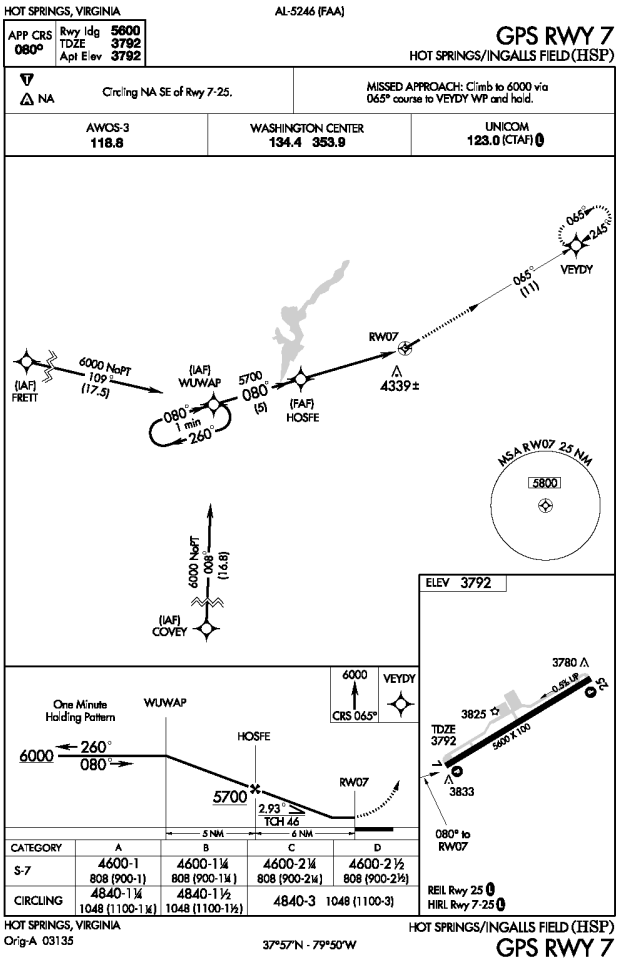
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Overview



GPS RWY 7

FAA PROCEDURE DATA		
Critical Obstacle:	4339	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:	2	**see note 2**
Rounding Adjustment:	9	
Minimum Descent Altitude / Decision Height:	4600	

Note 1: 100' Tree 2C

Note 2: secondary area adjustment, pilot request

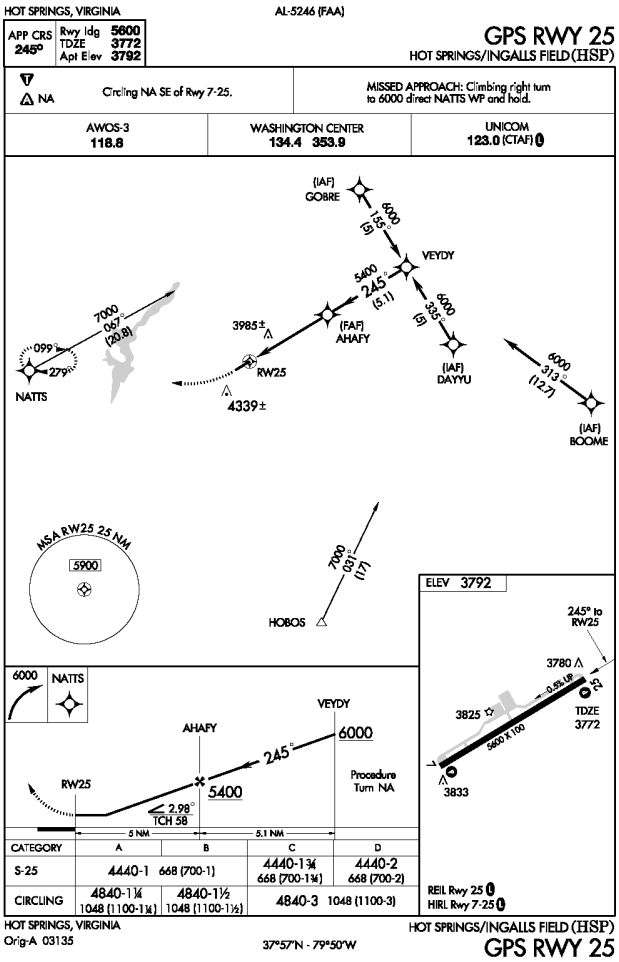
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Overview



GPS RWY 25

FAA PROCEDURE DATA		
Critical Obstacle:	3985	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:	200	**see note 2**
Rounding Adjustment:	5	
Minimum Descent Altitude / Decision Height:	4440	

Note 1: 100' Tree 2C

Note 2: pilot request

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	1 SM	**KNOWN DEFICIENCIES**
	REQUIRED	
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Recommendations

ILS RWY 25		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Distance Measuring Equipment Install Distance Measuring Equipment (DME). Co-locate with the localizer.	Improves pilot's situational awareness and simplifies procedure.	$200,000
Weather Reporting Install Runway Visual Range (RVR) equipment.	Reduces visibility minimum to as low as 2400 feet RVR.	$400,000 (duplicate)
Visibility Minimum Upon installation of runway visual range equipment, request procedure be updated to 4000 RVR.	Lower landing visibility minimum.	$360,000

GPS RWY 7		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Procedure Review Request procedure title be updated to RNAV (GPS) RWY 7 format.	Procedure clarity.	No equipment cost

Procedure Recommendations

GPS RWY 25		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Procedure Review Request procedure title be updated to RNAV (GPS) RWY 25 format.	Procedure clarity.	No equipment cost

Lake Anna (7W4)

Bumpass, Virginia

AIRPORT INFORMATION	
ROLE / CLASSIFICATION INFORMATION	
VATSP Classfication (2008):	Local Service
NPIAS Role (2008):	n/a
Study Classification:	Local Service

ACTIVITY INFORMATION	
Based Aircraft (2007):	2
Annual Operations (2020):	417
Annual Enplanements (2020):	n/a

DEVELOPMENT INFORMATION (2008)	
Critical Airport Reference Code (Existing):	A-I
Critical Airport Reference Code (Proposed):	A-I
Airport Layout Plan (Original):	September, 1997
Airport Layout Plan (Revision):	n/a

Proposed Development (from ALD):
- Widen runway (50')
- Increase runway strength to 12,500#

AERONAUTICAL SURVEY INFORMATION

Runway End	Survey Type	Survey Date
all	Photoslope	2006

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS	
Available Weather Reporting:	None
Common Traffic Advisory Frequency:	122.9
Clearance Delivery:	Phone

Nearby Navigational Aids:

LOUISA	NDB	382	IQK	130°/ 6.3 NM TO FIELD
GORDONSVILLE	VORTAC	115.6	GVE	104°/ 19.5 NM TO FIELD
FLATROCK	VORTAC	113.3	FAK	014°/ 26.5 NM TO FIELD
BROOKE	VORTAC	114.5	BRV	229°/ 29.0 NM TO FIELD

Lake Anna (7W4)

Bumpass, Virginia

REVIEWER COMMENTS

No published instrument approach procedures. The Airport Sponsor completed the requested informational survey.

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 8 26 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	A-I	A-I
Runway Dimensions (Length x Width in ft):	2560 x 25	2560 x 50
Runway to Taxiway Separation (feet):	none	none
Runway Lighting:	LIRL	MIRL
RUNWAY 8		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	250 x 450 x 1000	250 x 450 x 1000
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	REILs	VASI; REILs
RUNWAY 26		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	250 x 450 x 1000	250 x 450 x 1000
Runway Markings:	Visual	Visual
Available Visual Approach Aids:	none	VASI; REILs

Lawrenceville/Brunswick Municipal (LVL)

Lawrenceville, Virginia

AIRPORT INFORMATION	
ROLE / CLASSIFICATION INFORMATION	
VATSP Classfication (2008):	Local Service
NPIAS Role (2008):	n/a
Study Classification:	Local Service

ACTIVITY INFORMATION	
Based Aircraft (2007):	3
Annual Operations (2020):	3754
Annual Enplanements (2020):	n/a

DEVELOPMENT INFORMATION (2008)	
Critical Airport Reference Code (Existing):	B-I
Critical Airport Reference Code (Proposed):	B-I
Airport Layout Plan (Original):	December, 2000
Airport Layout Plan (Revision):	n/a

Proposed Development (from ALD):
- Upgrade RWY 36 RPZ to non-precision

AERONAUTICAL SURVEY INFORMATION

Runway End	Survey Type	Survey Date
all	Photoslope	2006

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS	
Available Weather Reporting:	None
Common Traffic Advisory Frequency:	122.8
Clearance Delivery:	Phone

Nearby Navigational Aids:

LAWRENCEVILLE	VORTAC	112.9	LVL	125°/ 5.9 NM TO FIELD

Lawrenceville/Brunswick Municipal (LVL)

Lawrenceville, Virginia

Instrument Approach Procedure Summary

Minimums listed are Category B

EXISTING PROCEDURES		
RUNWAY 18		
RNAV (GPS) RWY 18 - LNAV	840 - 1 (511)	Orig
RUNWAY 36		
RNAV (GPS) RWY 36 - LNAV	760 - 1 (433)	Orig

VISIBILITY CHANGES PROPOSED AS PART OF STUDY	
none	

REVIEWER COMMENTS

The Airport Sponsor completed the requested informational survey.

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 18 36 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	B-I (small)	B-I (small)
Runway Dimensions (Length x Width in ft):	3020 x 50	3020 x 50
Runway to Taxiway Separation (feet):	none	none
Runway Lighting:	MIRL	MIRL
RUNWAY 18		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	250 x 450 x 1000	250 x 450 x 1000
Runway Markings:	Visual	Visual
Available Visual Approach Aids:	APAP	PAPI
RUNWAY 36		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	250 x 450 x 1000	250 x 450 x 1000
Runway Markings:	Visual	Visual
Available Visual Approach Aids:	APAP	PAPI; REILs
RUNWAY 6 24 (TURF) INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	A-I	A-I
Runway Dimensions (Length x Width in ft):	1890 x 70	1890 x 70
Runway to Taxiway Separation (feet):	none	none
Runway Lighting:	none	none
RUNWAY 6		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	250 x 450 x 1000	250 x 450 x 1000
Runway Markings:	none	none
Available Visual Approach Aids:	none	none
RUNWAY 24		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	250 x 450 x 1000	250 x 450 x 1000
Runway Markings:	none	none
Available Visual Approach Aids:	none	none

Overall Recommendations

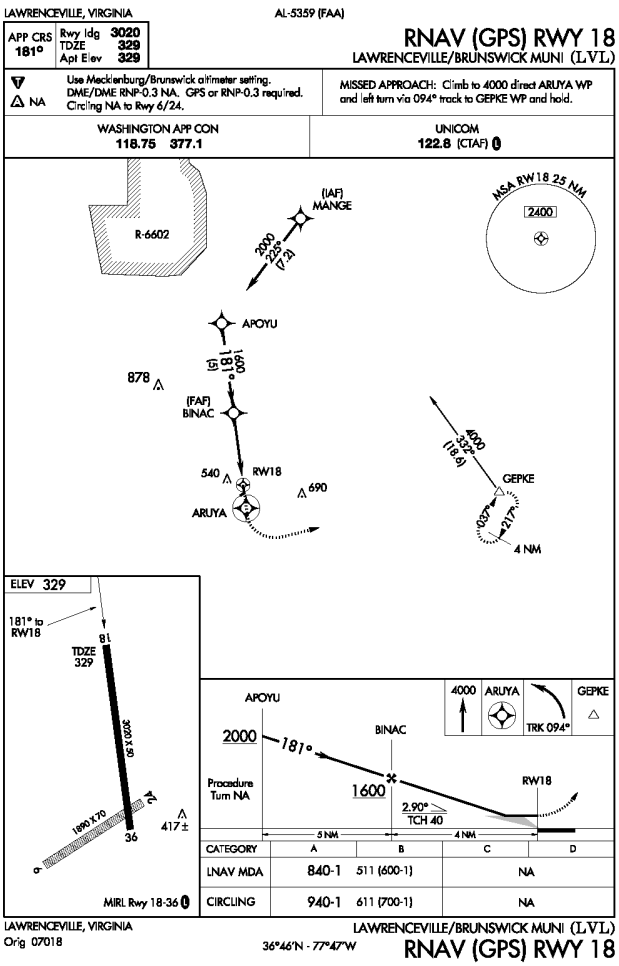
GENERAL		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Altimeter Source Install AWOS-A.	Provides local altimeter source.	$25,000

RUNWAY 18 36		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Airfield Lighting Control Change control sequence and/or facility directory note for MIRLs to be preset on low intensity with higher intensity activated on CTAF.	Provides visibilty of landing environment during night and adverse weather conditions even during times of aircraft equipment failure or pilot control system malfunction.	Less than $10,000

Lawrenceville/Brunswick Municipal (LVL)

Lawrenceville, Virginia

Procedure Overview



RNAV (GPS) RWY 18 - LNAV

FAA PROCEDURE DATA		
Critical Obstacle:	457	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:	47	
Accuracy Code Adjustment:		
Other Adjustment:	70	**see note 2**
Rounding Adjustment:	16	
Minimum Descent Altitude / Decision Height:	840	

Note 1: 88' Tree 2C

Note 2: missed approach segment

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

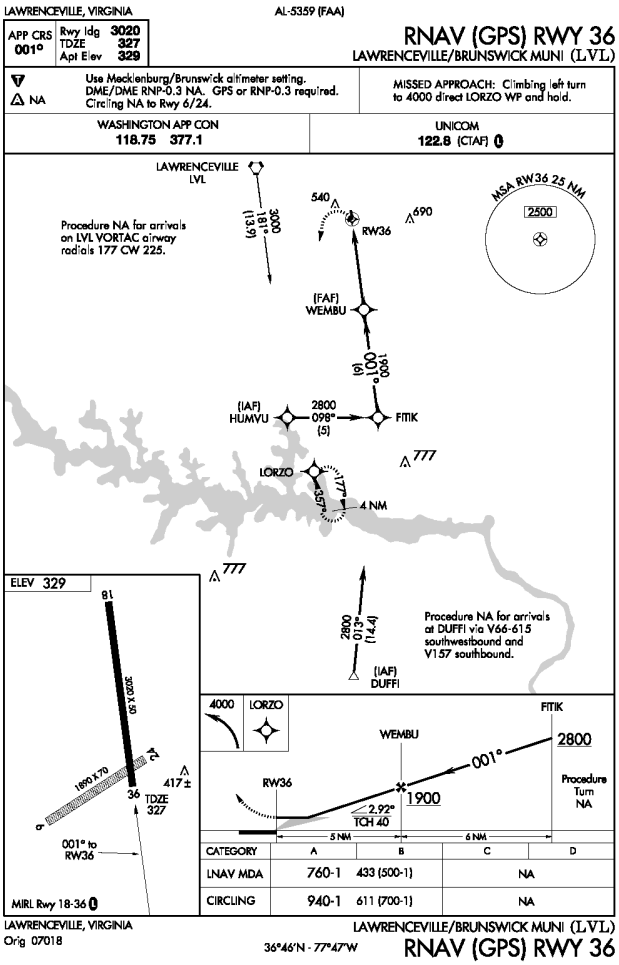
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	Yes
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	Yes
Runway Markings	Nonprecision	Yes
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	Yes
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	Yes
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	Yes
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Lawrenceville/Brunswick Municipal (LVL)

Lawrenceville, Virginia

Procedure Overview



RNAV (GPS) RWY 36 - LNAV

FAA PROCEDURE DATA		
Critical Obstacle:	417	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:	47	
Accuracy Code Adjustment:		
Other Adjustment:	30	**see note 2**
Rounding Adjustment:	16	
Minimum Descent Altitude / Decision Height:	760	

Note 1: 88' Tree 2C

Note 2: missed approach segment

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	1 SM **REQUIRED**	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	Yes
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	Yes
Runway Markings	Nonprecision	Yes
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	Yes
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	Yes
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	Yes
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Recommendations

RNAV (GPS) RWY 18		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Altimeter Source Install AWOS-A and request FAA re-evaluation of remote altimeter setting source penalty. See Overall Recommendations.	Minimum Descent Altitude (MDA) may be reduced by 40 to 60 feet by eliminating the remote altimeter setting source (RASS) adjustment.	$25,000 (duplicate)

RNAV (GPS) RWY 36		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Altimeter Source Install AWOS-A and request FAA re-evaluation of remote altimeter setting source penalty. See Overall Recommendations.	Minimum Descent Altitude (MDA) may be reduced by 40 to 60 feet by eliminating the remote altimeter setting source (RASS) adjustment.	$25,000 (duplicate)

Lee County (0VG)

Jonesville, Virginia

AIRPORT INFORMATION	
ROLE / CLASSIFICATION INFORMATION	
VATSP Classfication (2008):	General Aviation Community
NPIAS Role (2008):	General Aviation
Study Classification:	General Aviation Community

ACTIVITY INFORMATION	
Based Aircraft (2007):	11
Annual Operations (2020):	8091
Annual Enplanements (2020):	n/a
DEVELOPMENT INFORMATION (2008)	
Critical Airport Reference Code (Existing):	B-II
Critical Airport Reference Code (Proposed):	B-II
Airport Layout Plan (Original):	January, 1997
Airport Layout Plan (Revision):	May, 2007

Proposed Development (from ALD):
- Install LOC (RWY 25)
- Install ODALS on Rwy 25

AERONAUTICAL SURVEY INFORMATION

Runway End	Survey Type	Survey Date
all	Photoslope	2006
25	ANA-LPV	2007

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS	
Available Weather Reporting:	AWOS-III (under construction)
Common Traffic Advisory Frequency:	122.9
Clearance Delivery:	Phone
Nearby Navigational Aids:	LONG HOLLOW NDB 252 LQV 248°/ 7.6 NM TO FIELD

Lee County (0VG)

Jonesville, Virginia

Instrument Approach Procedure Summary

Minimums listed are Category B

EXISTING PROCEDURES		
RUNWAY 25		
RNAV (GPS) RWY 25 - LNAV	2260 - 1 (849)	Orig
RUNWAY 7		
RNAV (GPS) RWY 7 - LNAV	2140 - 1 (737)	Orig

PROCEDURES PROPOSED AS PART OF STUDY
LOC RWY 25
RNAV (GPS) RWY 25 - LPV
RNAV (GPS) RWY 7 - LPV

VISIBILITY CHANGES PROPOSED AS PART OF STUDY	
none	

REVIEWER COMMENTS

The airport does not currently have any vertically-guided or ground-based approaches. A ground-based approach (LOC RWY 25) is proposed for redundancy. The Airport Sponsor completed the requested informational survey.

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 7 25 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	B-II	B-II
Runway Dimensions (Length x Width in ft):	5000 x 75	5000 x 75
Runway to Taxiway Separation (feet):	300	300
Runway Lighting:	MIRL	MIRL
RUNWAY 7		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 700 x 1000	500 x 700 x 1000
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	PAPI; REILs	PAPI; REILs
RUNWAY 25		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 700 x 1000	500 x 700 x 1000
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	PAPI; REILs	PAPI; ODALS

Lee County (0VG)

Jonesville, Virginia

System Benchmarks

General Aviation Community			
Best Approach (Primary Runway End)			
BENCHMARK		**RUNWAY 7**	
Approach:	Ground-based	☐ meets	n/a (no ground-based approach available)
Ceiling:	500 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Approach:	LNAV	☑ meets	RNAV (GPS) RWY 7 - LNAV
Ceiling:	400 AGL	☐ meets	
Visibility:	1 statute mile	☑ meets	
Equipment:	REILs, MIRLs, PAPI	☑ meets	
Secondary Approach (Different Runway End)			
BENCHMARK		**RUNWAY 25**	
Approach:		☐ meets	n/a (no ground-based approach available)
Ceiling:		☐ meets	
Visibility:		☐ meets	
Approach:	LNAV	☑ meets	RNAV (GPS) RWY 25 - LNAV
Ceiling:	500 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Equipment:	REILs, MIRLs, PAPI	☑ meets	

Additional Requirements			
Weather:	Normally on-field, 24/7, data-linked	☐ meets	
Access to ATC Clearance:	RTR or GCO	☐ meets	
ADS-B Coverage:	1000 AGL	☐ meets	

Overall Recommendations

GENERAL		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Altimeter Source / Weather Reporting Install AWOS-III.	Provides local altimeter source and weather reporting.	Underway
Communications Install a Ground Communication Outlet (GCO) directly with Atlanta Center.	Provides direct communication with approach control via radio and an "on-demand" telephone land line link. Used by aircraft on ground for obtaining or canceling IFR clearances.	$20,000
Airport Identifier Update airport identifier to three letter format.	Consistency.	No equipment cost
Communications Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	Improves pilot/controller communications and clearance delivery process.	Less than $5,000
Data link Provide ADS-B coverage at 1000 AGL or lower.	Provides traffic surveillance, terrain avoidance, weather data, etc. Crucial component for Next Generation Air Transportation System.	Unknown

RUNWAY 7 25		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Airfield Lighting Control Change control sequence and/or facility directory note for MIRLs to be preset on low intensity with higher intensity activated on CTAF.	Provides visibilty of landing environment during night and adverse weather conditions even during times of aircraft equipment failure or pilot control system malfunction.	Less than $10,000

Overall Recommendations

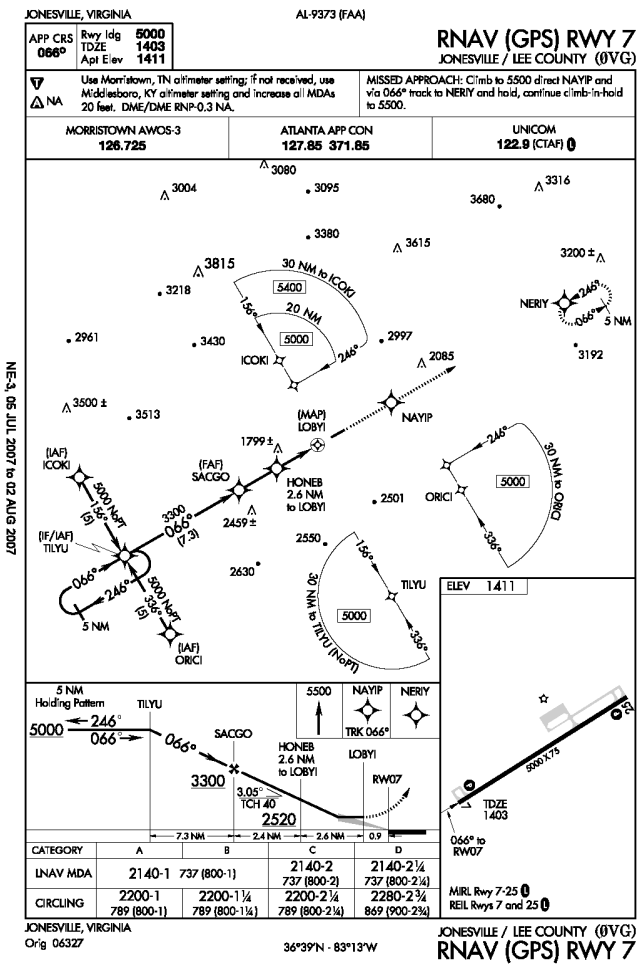
RUNWAY 7		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
New Procedure Request development of RNAV (GPS) RWY 7 Approach with LPV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost
Aeronautical Survey Request / complete aeronautical survey to enable development of LPV approach to Runway 7.	Provides survey data for instrument approach procedures.	Underway

RUNWAY 25		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Aeronautical Survey Request / complete aeronautical survey to enable development of LPV approach to Runway 25.	Provides survey data for instrument approach procedures.	$40,000
New Procedure Request development of RNAV (GPS) RWY 25 Approach with LPV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost
New Procedure Install localizer and request development of LOC RWY 25 approach.	Provides a straight-in, ground-based approach.	$200,000
Distance Measuring Equipment Install Distance Measuring Equipment (DME) in conjunction with localizer.	Improves pilot's situational awareness. Establishes final approach and step-down fix.	$100,000

Lee County (0VG)

Jonesville, Virginia

Procedure Overview



RNAV (GPS) RWY 7 - LNAV

FAA PROCEDURE DATA		
Critical Obstacle:	1799	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:	82	
Accuracy Code Adjustment:		
Other Adjustment:	-1	**see note 2**
Rounding Adjustment:	10	
Minimum Descent Altitude / Decision Height:	2140	

Note 1: SPT+60' Tree

Note 2: secondary area adjustment, missed approach segment

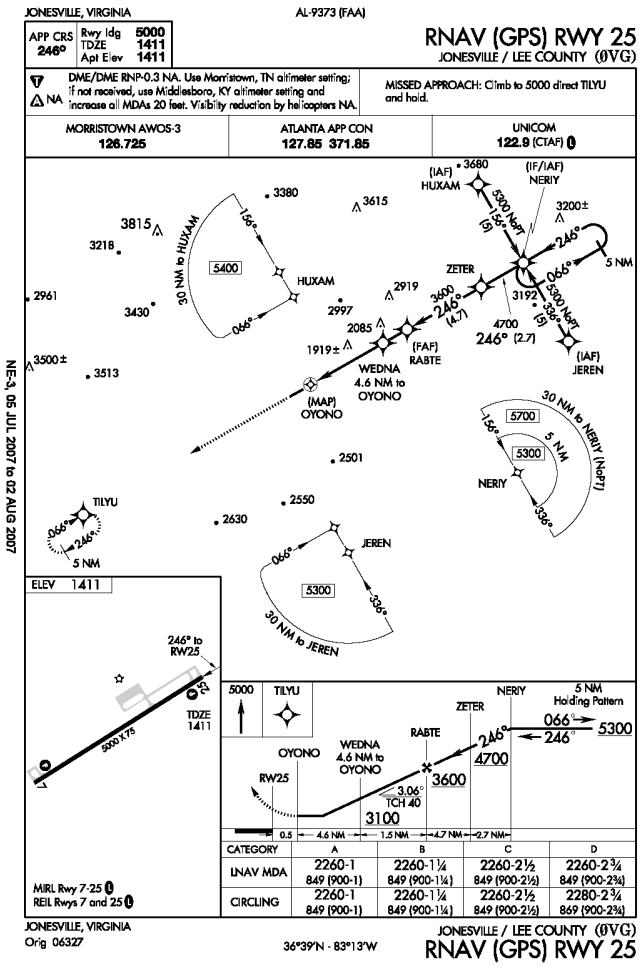
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	Yes
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Overview



RNAV (GPS) RWY 25 - LNAV

FAA PROCEDURE DATA		
Critical Obstacle:	1919	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:	82	
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	9	
Minimum Descent Altitude / Decision Height:	2260	

Note 1: 60' Tree

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	Yes
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Recommendations

RNAV (GPS) RWY 7		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Altimeter Source / Weather Reporting Install AWOS-III and request FAA re-evaluation of remote altimeter setting source penalty. See Overall Recommendations.	Minimum Descent Altitude (MDA) may be reduced by 80 feet by eliminating the remote altimeter setting source (RASS) adjustment.	Underway

RNAV (GPS) RWY 25		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Altimeter Source / Weather Reporting Install AWOS-III and request FAA re-evaluation of remote altimeter setting source penalty. See Overall Recommendations.	Minimum Descent Altitude (MDA) may be reduced by 80 feet by eliminating the remote altimeter setting source (RASS) adjustment.	Underway

Leesburg Executive (JYO)

Leesburg, Virginia

AIRPORT INFORMATION	
ROLE / CLASSIFICATION INFORMATION	
VATSP Classfication (2008):	Reliever
NPIAS Role (2008):	Reliever
Study Classification:	Reliever

ACTIVITY INFORMATION	
Based Aircraft (2007):	267
Annual Operations (2020):	133359
Annual Enplanements (2020):	n/a

DEVELOPMENT INFORMATION (2008)	
Critical Airport Reference Code (Existing):	C-II
Critical Airport Reference Code (Proposed):	C-II
Airport Layout Plan (Original):	March, 2007
Airport Layout Plan (Revision):	n/a

Proposed Development (from ALD):

- Extend RWY 17 (500')
- Upgrade RWY 17 RPZ
- Install ILS (RWY 17)
- Upgrade RWY 35 RPZ

AERONAUTICAL SURVEY INFORMATION

Runway End	Survey Type	Survey Date
all	Photoslope	2006
all	OC-JYO 5288	1993
35	ANAPC	2003
17	ANAPC	2003

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS	
Available Weather Reporting:	AWOS-III (PT), unreliable
Common Traffic Advisory Frequency:	122.975
Clearance Delivery:	RTR

Nearby Navigational Aids:

WASHINGTON	VOR/DME	111	DCA	307°/ 27.6 NM TO FIELD
MARTINSBURG	VORTAC	112.1	MRB	151°/ 22.9 NM TO FIELD
FREDERICK	VOR	109	FDK	211°/ 21.8 NM TO FIELD
CASANOVA	VORTAC	116.3	CSN	035°/ 29.9 NM TO FIELD
ARMEL	VORTAC	113.5	AML	342°/ 9.6 NM TO FIELD

Leesburg Executive (JYO)

Leesburg, Virginia

Instrument Approach Procedure Summary

Minimums listed are Category B

EXISTING PROCEDURES		
CIRCLING		
VOR OR GPS-A	900 - 1 (511)	Amdt 1A
RUNWAY 17		
LOC RWY 17	720 - 1 (338)	Amdt 2A
RNAV (GPS) RWY 17 - LNAV	860 - 1 (478)	Amdt 1
RNAV (GPS) RWY 17 - LPV	443 - 1 (258)	Amdt 1
RNAV (GPS) RWY 17 - VNAV	740 - 1 (358)	Amdt 1

PROCEDURES PROPOSED AS PART OF STUDY
ILS RWY 17
RNAV (GPS) RWY 35 - LNAV
RNAV (GPS) RWY 35 - LPV
RNAV (RNP) RWY 35

VISIBILITY CHANGES PROPOSED AS PART OF STUDY	
RUNWAY 17:	1 SM to 1/2 SM
RUNWAY 35:	1 SM to 3/4 SM

REVIEWER COMMENTS

The FAA is currently upgrading the LOC RWY 17 approach to an instrument landing system (ILS). The Study recommends a reduction in landing visibility minimums. Additional information regarding the estimated impacts and costs associated with the visibility changes is included in Appendix E. The Airport Sponsor completed the requested informational survey.

SPONSOR COMMENTS

Sponsor notes that AWOS is unreliable due to proximity of existing buildings. Sponsor notes that VOR or GPS-A, Amdt 1B is current (published after Study inventory).

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 17 35 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	C-II	C-II
Runway Dimensions (Length x Width in ft):	5500 x 100	6000 x 100
Runway to Taxiway Separation (feet):	263	300
Runway Lighting:	HIRL	HIRL
RUNWAY 17		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 1010 x 1700	1000 x 1510 x 1700
Runway Markings:	Precision	Precision
Available Visual Approach Aids:	PAPI; REILs	PAPI; ODALS
RUNWAY 35		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 1010 x 1700	1000 x 1510 x 1700
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	PAPI; REILs	PAPI; REILs

Leesburg Executive (JYO)

Leesburg, Virginia

System Benchmarks

Reliever			
Best Approach (Primary Runway End)			
BENCHMARK		**RUNWAY 17**	
Approach:	ILS CAT I	☐ meets	LOC RWY 17
Ceiling:	200 AGL	☐ meets	
Visibility:	1/2 statute mile	☐ meets	
Approach:	LPV	☑ meets	RNAV (GPS) RWY 17 - LPV
Ceiling:	200 AGL	☐ meets	
Visibility:	1/2 statute mile	☐ meets	
Equipment:	MALSR, HIRLs, PAPI	☐ meets	existing HIRLs, PAPI
Secondary Approach (Different Runway End)			
BENCHMARK		**RUNWAY 35**	
Approach:	Ground-based	☐ meets	n/a (no ground-based approach available)
Ceiling:	400 AGL	☐ meets	
Visibility:	3/4 staute mile	☐ meets	
Approach:	LPV	☐ meets	n/a (no satellite-based approach available)
Ceiling:	250 AGL	☐ meets	
Visibility:	3/4 statute mile	☐ meets	
Equipment:	MALS, HIRLs, PAPI	☐ meets	existing HIRLs, PAPI

Additional Requirements			
Weather:	on-field, 24/7, data-linked	☑ meets	
Access to ATC Clearance:	RTR	☑ meets	
ADS-B Coverage:	On ground	☐ meets	

Overall Recommendations

GENERAL		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Weather Reporting Upgrade existing AWOS-III to include freezing rain sensor.	Improves information available to pilot.	$50,000
Communications Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	Improves pilot/controller communications and clearance delivery process.	Less than $5,000
Data link Provide ADS-B coverage while on the ground.	Provides traffic surveillance, terrain avoidance, weather data, etc. Crucial component for Next Generation Air Transportation System.	$100,000
Local Area Augmentation System (LAAS) Provide LAAS coverage to augment existing global positioning system.	Provides enhanced signal accuracy.	Unknown

RUNWAY 17 35		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Airfield Lighting Control Change control sequence and/or facility directory note for HIRLs to be preset on low intensity with higher intensity activated on CTAF.	Provides visibilty of landing environment during night and adverse weather conditions even during times of aircraft equipment failure or pilot control system malfunction.	Less than $10,000

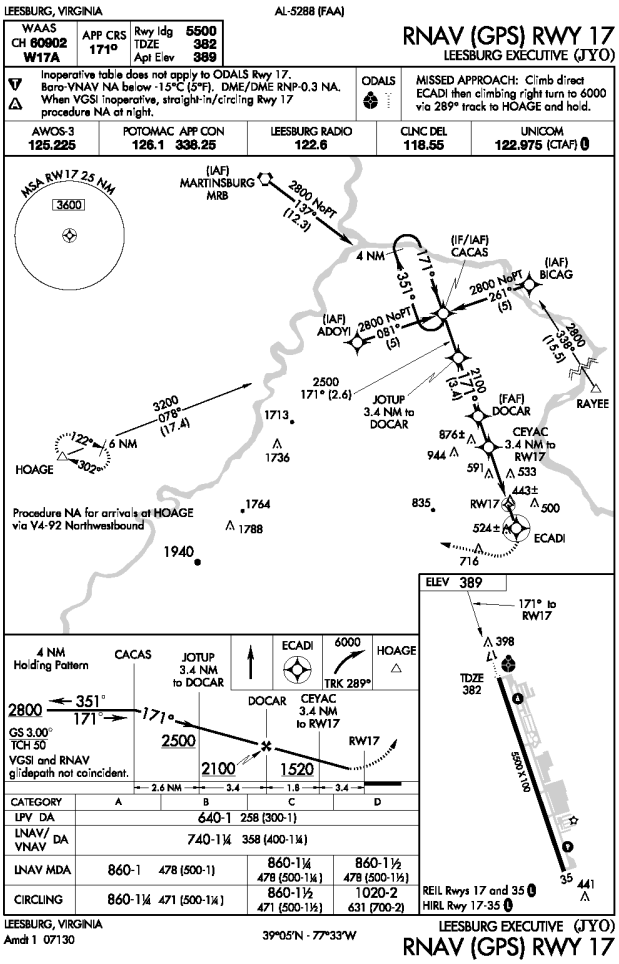
Overall Recommendations

RUNWAY 17		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Approach Lighting System Upgrade nonstandard Runway 17 ODALS to MALSR.	Improves pilot's ability to detect the landing environment.	$850,000
Visibility Minimum Upon installation of approach lighting system and subsequent acceptance of visibility credit (1 sm to 3/4 sm), different design standards apply (less than 1 mile).	Lower landing visibility minimum.	$5,500,000
Aeronautical Survey Request / complete updated aeronautical survey.	Provides survey data for instrument approach procedures.	$50,000
Visibility Minimum Upon installation of approach lighting system and subsequent acceptance of visibility credit (3/4 sm to 1/2 sm), different design standards apply (less than 1 mile).	Lower landing visibility minimum.	$25,500,000
New Procedure Install glide slope to complete ILS RWY 17.	Improve all-weather capability of the runway and airport.	Underway

Overall Recommendations

RUNWAY 35		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions.	Standards.	Varies
Approach Lighting System Install MALS for Runway 35.	Improves pilot's ability to detect the landing environment.	$400,000
Visibility Minimum Upon installation of approach lighting system and subsequent acceptance of visibility credit, different design standards apply (less than 1 mile).	Lower landing visibility minimum.	$5,500,000
Aeronautical Survey Request / complete updated aeronautical survey.	Provides survey data for instrument approach procedures.	$50,000 (duplicate)
New Procedure Request development of RNAV (GPS) RWY 35 Approach with LPV and LNAV landing minimums. Procedure may be designed to align with runway centerline or parallel to IAD traffic flow.	Improve all-weather capability of the runway and airport and eliminate requirement for circle-to-land operations.	No equipment cost

Procedure Overview



RNAV (GPS) RWY 17 - LPV

FAA PROCEDURE DATA	
Critical Obstacle:	**see note 1**
Required Obstacle Clearance:	
Remote Altimeter Adjustment:	
Accuracy Code Adjustment:	
Other Adjustment:	**see note 2**
Rounding Adjustment:	
Minimum Descent Altitude / Decision Height:	443

Note 1: ASC

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

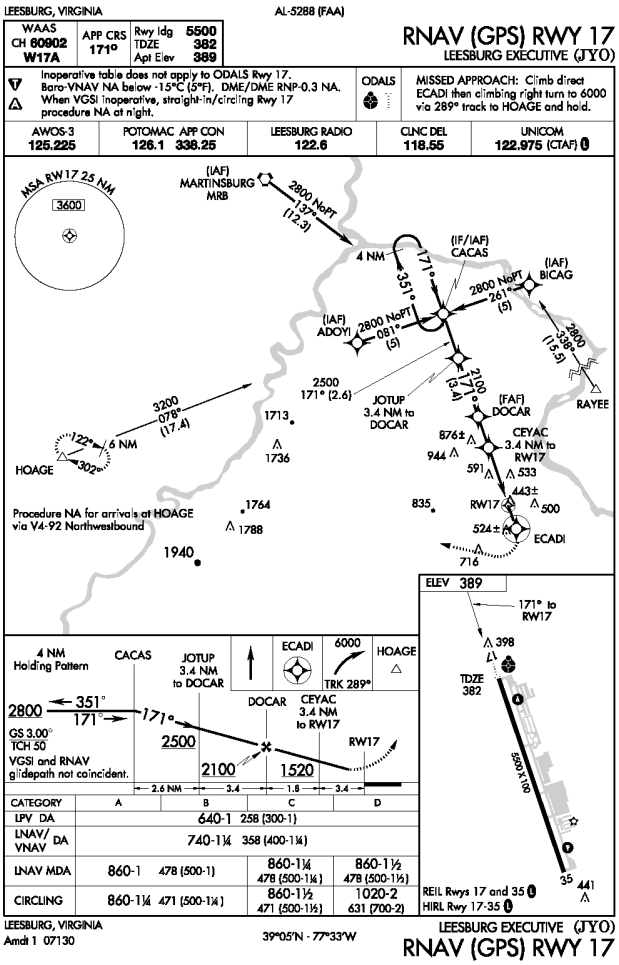
TABLE A16-1B - APPROACH PROCEDURE WITH VERTICAL GUIDANCE APPROACH REQUIREMENTS

	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 4 and 8, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Leesburg Executive (JYO)

Leesburg, Virginia

Procedure Overview



RNAV (GPS) RWY 17 - VNAV

FAA PROCEDURE DATA		
Critical Obstacle:	443	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:	47	**see note 2**
Rounding Adjustment:	0	
Minimum Descent Altitude / Decision Height:	740	

Note 1: tree

Note 2: missed approach segment

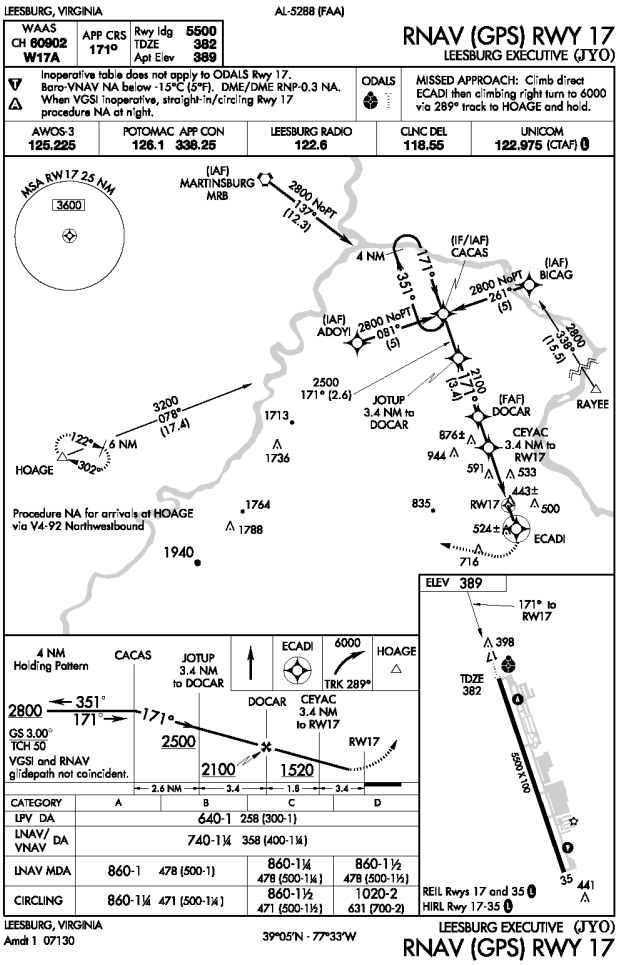
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1B - APPROACH PROCEDURE WITH VERTICAL GUIDANCE APPROACH REQUIREMENTS

	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 4 and 8, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Procedure Overview



RNAV (GPS) RWY 17 - LNAV

FAA PROCEDURE DATA		
Critical Obstacle:	591	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	19	
Minimum Descent Altitude / Decision Height:	860	

Note 1: Tower

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

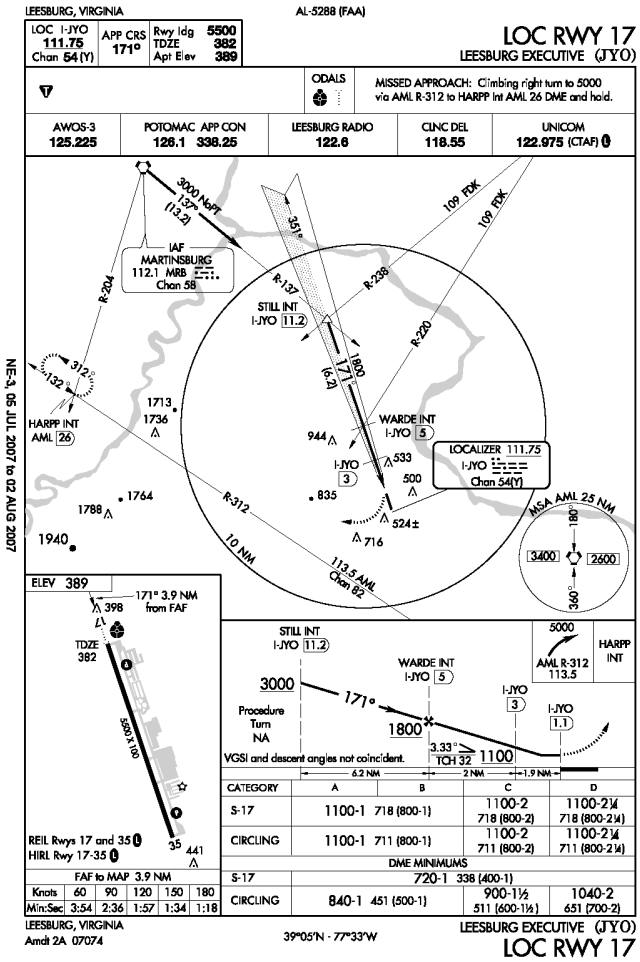
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Leesburg Executive (JYO)

Leesburg, Virginia

Procedure Overview



LOC RWY 17

FAA PROCEDURE DATA		
Critical Obstacle:	469	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	1	
Minimum Descent Altitude / Decision Height:	720	

Note 1: 100' tree

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

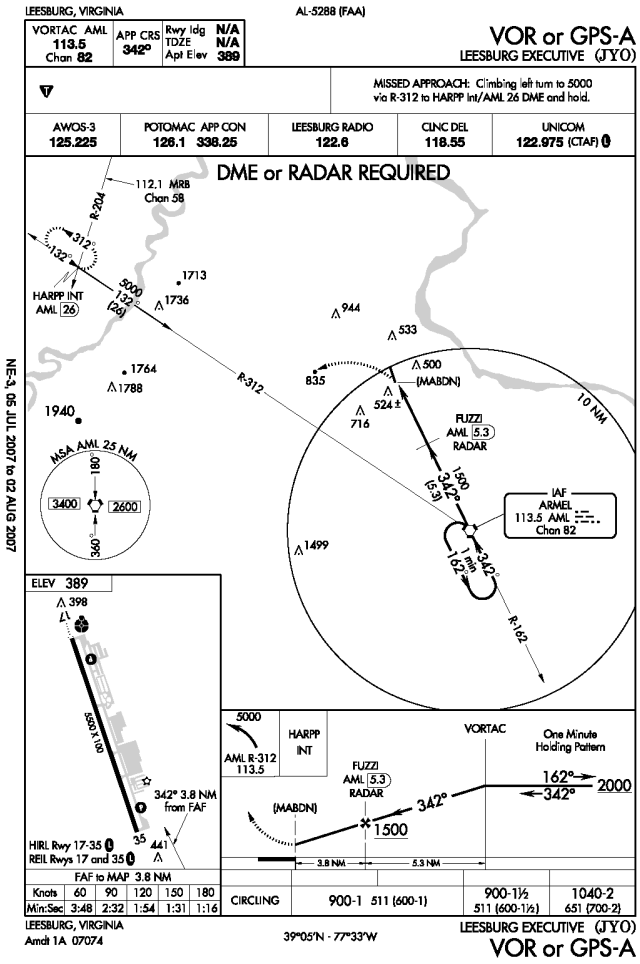
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Leesburg Executive (JYO)

Leesburg, Virginia

Procedure Overview



VOR OR GPS-A

FAA PROCEDURE DATA		
Critical Obstacle:	584	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:	50	
Other Adjustment:		**see note 2**
Rounding Adjustment:	16	
Minimum Descent Altitude / Decision Height:	900	

Note 1: Tower 4D

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	CIRCLING	KNOWN DEFICIENCIES
	REQUIRED	
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Recommended	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Visual (Basic)	None
Holding Position Signs and Markings	Visual (Basic)	None
Runway Edge Lights	MIRL / LIRL (for night minima only)	None
Parallel Taxiway	Recommended	None
Approach Lights	Not Required	None
Runway Design Standards	Not Required	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-2, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Recommendations

RNAV (GPS) RWY 17		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Visibility Minimum Upon installation of approach lighting system, request procedure be updated to 3/4 mile visibility.	Lower landing visibility minimum.	See Overall Recommendations

LOC RWY 17		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Glide Slope Install glide slope to complete ILS RWY 17.	Improve all-weather capability of the runway and airport.	Underway
Visibility Minimum Upon installation of approach lighting system, request procedure be updated to 3/4 mile visibility.	Lower landing visibility minimum.	See Overall Recommendations

VOR OR GPS A		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a

Lonesome Pine (LNP)

Wise, Virginia

AIRPORT INFORMATION	
ROLE / CLASSIFICATION INFORMATION	
VATSP Classfication (2008):	General Aviation Regional
NPIAS Role (2008):	General Aviation
Study Classification:	General Aviation Regional (1/2 mile visibility)

ACTIVITY INFORMATION	
Based Aircraft (2007):	27
Annual Operations (2020):	10636
Annual Enplanements (2020):	n/a

DEVELOPMENT INFORMATION (2008)	
Critical Airport Reference Code (Existing):	B-II
Critical Airport Reference Code (Proposed):	B-II
Airport Layout Plan (Original):	December, 1996
Airport Layout Plan (Revision):	n/a

Proposed Development (from ALD):

- Complete parallel taxiway

AERONAUTICAL SURVEY INFORMATION

Runway End	Survey Type	Survey Date
all	Photoslope	2001
24	ANAPC	2002
24	ANAPC	2006
6	ANAPC	2006

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS	
Available Weather Reporting:	AWOS-III
Common Traffic Advisory Frequency:	123.0
Clearance Delivery:	RTR

Nearby Navigational Aids:

GLADE SPRING	VOR/DME	110.2	GZG	296°/ 23.7 NM TO FIELD

Lonesome Pine (LNP)

Wise, Virginia

Instrument Approach Procedure Summary

Minimums listed are Category B

EXISTING PROCEDURES		
RUNWAY 24		
LOC/DME RWY 24	3300 - 1 (615)	Orig A
RNAV (GPS) RWY 24 - LNAV	3400 - 1 (337)	Orig
RNAV (GPS) RWY 24 - LPV	3021 - 1 (337)	Orig
RNAV (GPS) RWY 24 - VNAV	3126 - 1 (337)	Orig
RUNWAY 6		
GPS RWY 6	3280 - 1 (609)	Orig
RNAV (GPS) RWY 6 - LNAV	3260 - 1 (589)	Orig

PROCEDURES PROPOSED AS PART OF STUDY
ILS RWY 24
RNAV (GPS) RWY 6 - LPV

VISIBILITY CHANGES PROPOSED AS PART OF STUDY	
RUNWAY 24:	1 SM to 1/2 SM

REVIEWER COMMENTS

The LOC / DME RWY 24 approach is currently being upgraded to an instrument landing system (ILS). The Study recommends a reduction in visibility minimums from 1 mile to 3/4 mile. Additional information regarding the estimated impacts and costs associated with the visibility changes is included in Appendix E. The Airport Sponsor completed the requested informational survey.

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 6 24 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	B-II	B-II
Runway Dimensions (Length x Width in ft):	5280 x 100	5280 x 100
Runway to Taxiway Separation (feet):	400	400
Runway Lighting:	MIRL	MIRL
RUNWAY 6		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 700 x 1000	500 x 700 x 1000
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	PAPI; REILs	PAPI; REILs
RUNWAY 24		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 700 x 1000	500 x 700 x 1000
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	PAPI; REILs	PAPI; ODALS

Lonesome Pine (LNP)

Wise, Virginia

System Benchmarks

General Aviation Regional (1/2 mile visibility)			
Best Approach (Primary Runway End)			
BENCHMARK		**RUNWAY 24**	
Approach:	ILS CAT I	☐ meets	LOC/DME RWY 24
Ceiling:	200 AGL	☐ meets	
Visibility:	1/2 statue mile	☐ meets	
Approach:	LPV	☑ meets	RNAV (GPS) RWY 24 - LPV
Ceiling:	200 AGL	☐ meets	
Visibility:	1/2 statute mile	☐ meets	
Equipment:	MALSR, HIRLs, PAPI	☐ meets	existing PAPI
Secondary Approach (Different Runway End)			
BENCHMARK		**RUNWAY 6**	
Approach:	Ground-based	☐ meets	n/a (no ground-based approach available)
Ceiling:	400 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Approach:	LPV	☐ meets	RNAV (GPS) RWY 6 - LNAV
Ceiling:	250 AGL	☐ meets	
Visibility:	1 statute mile	☑ meets	
Equipment:	REILs, HIRLs, PAPI	☐ meets	existing PAPI

Additional Requirements			
Weather:	on-field, 24/7, data-linked	☑ meets	
Access to ATC Clearance:	RTR	☑ meets	
ADS-B Coverage:	On ground	☐ meets	

Overall Recommendations

GENERAL		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Weather Reporting Upgrade existing AWOS-III to include present weather, lightning and freezing rain sensor.	Improves information available to pilot.	$60,000
Communications Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	Improves pilot/controller communications and clearance delivery process.	Less than $5,000
Data link Provide ADS-B coverage while on the ground.	Provides traffic surveillance, terrain avoidance, weather data, etc. Crucial component for Next Generation Air Transportation System.	$100,000
Local Area Augmentation System (LAAS) Provide LAAS coverage to augment existing global positioning system.	Provides enhanced signal accuracy.	Unknown
RUNWAY 6 24		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Airfield Lighting Control Change control sequence and/or facility directory note for MIRLs to be preset on low intensity with higher intensity activated on CTAF.	Provides visibilty of landing environment during night and adverse weather conditions even during times of aircraft equipment failure or pilot control system malfunction.	Less than $10,000
Runway Lighting Replace Medium Intensity Runway Lights (MIRLs) with High Intensity Runway Lights (HIRLs).	Improves pilot's ability to detect the runway environment.	$300,000

Overall Recommendations

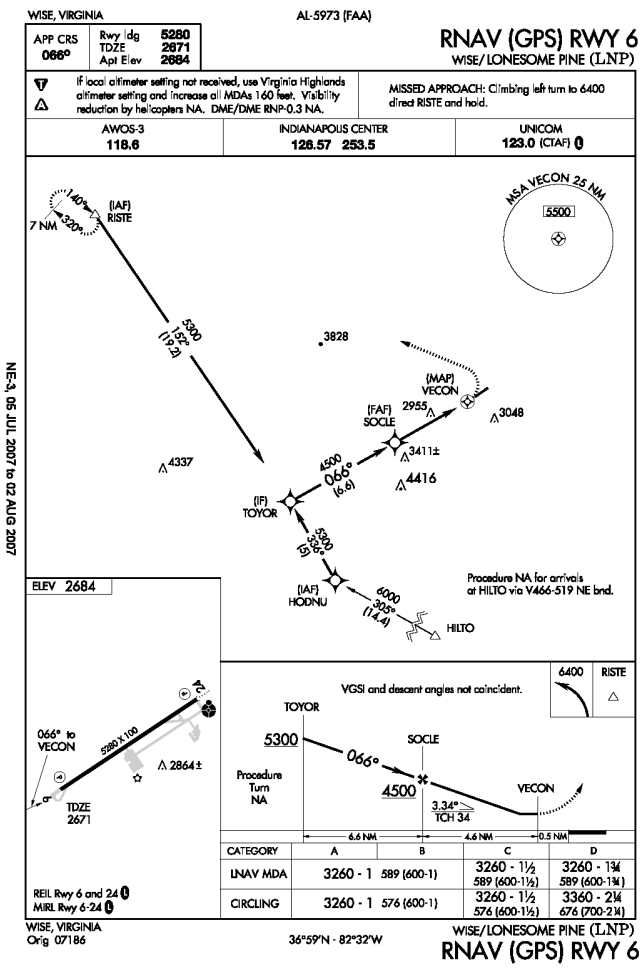
RUNWAY 6		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions.	Standards.	Varies
Precision Approach Path Indicator Upgrade Runway 6 PAPI from a 2 box to a 4 box unit.	Provides improved visual vertical descent guidance information during the approach to the runway.	$20,000
New Procedure Request development of RNAV (GPS) RWY 6 Approach with LPV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost

RUNWAY 24		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions.	Standards.	Varies
Precision Approach Path Indicator Upgrade Runway 24 PAPI from a 2 box to a 4 box unit.	Provides improved visual vertical descent guidance information during the approach to the runway.	$20,000
Approach Lighting System Install MALSR for Runway 24.	Improves pilot's ability to detect the landing environment.	$1,300,000
New Procedure Install glide slope to complete ILS RWY 24.	Improve all-weather capability of the runway and airport.	Underway
Visibility Minimum Upon installation of the glide slope, the visibility minimum is reduced from 1 statute mile to 1/2 statute mile and different airport design standards apply.	Lower landing visibility minimum.	$1,842,000

Lonesome Pine (LNP)

Wise, Virginia

Procedure Overview



RNAV (GPS) RWY 6 - LNAV

FAA PROCEDURE DATA		
Critical Obstacle:	2955	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:	50	
Other Adjustment:		**see note 2**
Rounding Adjustment:	5	
Minimum Descent Altitude / Decision Height:	3260	

Note 1: WNVA 1350 (47-0132)

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

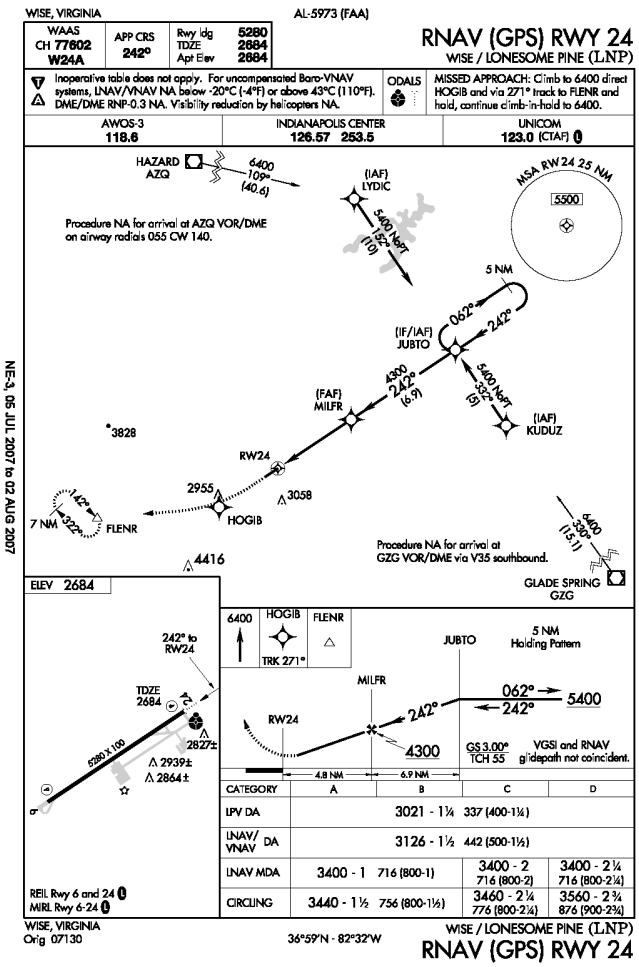
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	Partial
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Lonesome Pine (LNP)

Wise, Virginia

Procedure Overview



RNAV (GPS) RWY 24 - LPV

FAA PROCEDURE DATA	
Critical Obstacle:	2752 **see note 1**
Required Obstacle Clearance:	
Remote Altimeter Adjustment:	
Accuracy Code Adjustment:	
Other Adjustment:	83 **see note 2**
Rounding Adjustment:	
Minimum Descent Altitude / Decision Height:	3021

Note 1: Tree (KLNPA019)

Note 2: missed approach segment

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

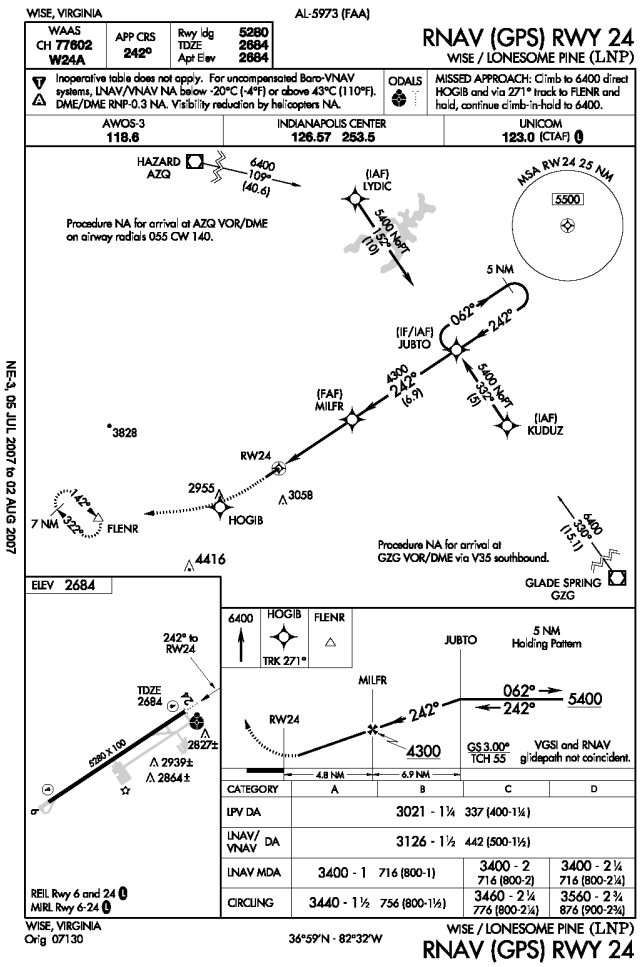
TABLE A16-1B - APPROACH PROCEDURE WITH VERTICAL GUIDANCE APPROACH REQUIREMENTS

	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	Partial
Approach Lights	Recommended	Non-Standard
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 4 and 8, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Lonesome Pine (LNP)

Wise, Virginia

Procedure Overview



RNAV (GPS) RWY 24 - VNAV

FAA PROCEDURE DATA	
Critical Obstacle:	2827 **see note 1**
Required Obstacle Clearance:	
Remote Altimeter Adjustment:	
Accuracy Code Adjustment:	
Other Adjustment:	49 **see note 2**
Rounding Adjustment:	
Minimum Descent Altitude / Decision Height:	3126

Note 1: Tree (KLNPA003)

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

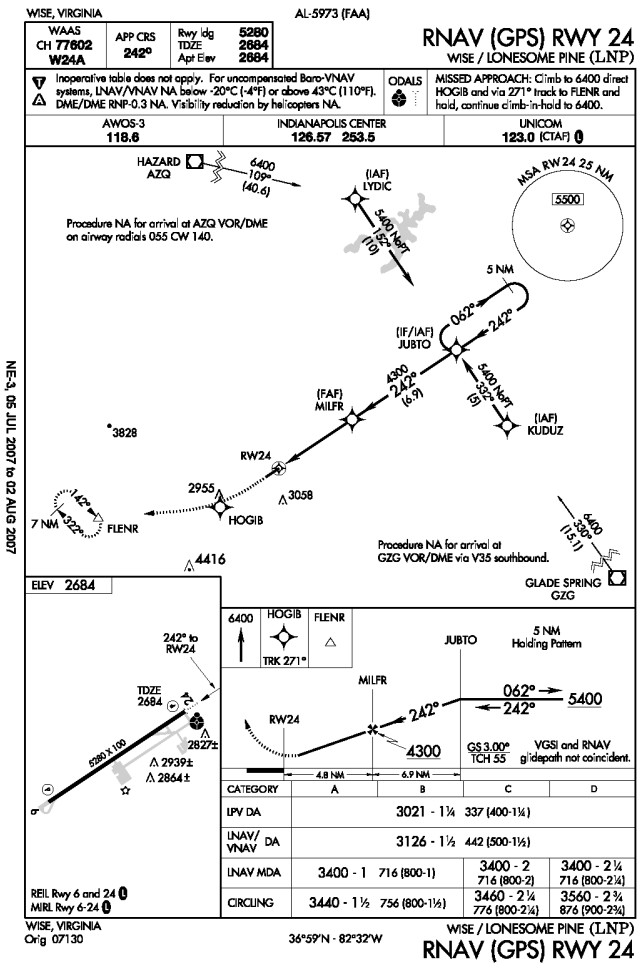
TABLE A16-1B - APPROACH PROCEDURE WITH VERTICAL GUIDANCE APPROACH REQUIREMENTS

	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	Partial
Approach Lights	Recommended	Non-Standard
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 4 and 8, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Lonesome Pine (LNP)

Wise, Virginia

Procedure Overview



RNAV (GPS) RWY 24 - LNAV

FAA PROCEDURE DATA		
Critical Obstacle:	2939	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:	200	**see note 2**
Rounding Adjustment:	11	
Minimum Descent Altitude / Decision Height:	3400	

Note 1: Trees

Note 2: pilot request

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

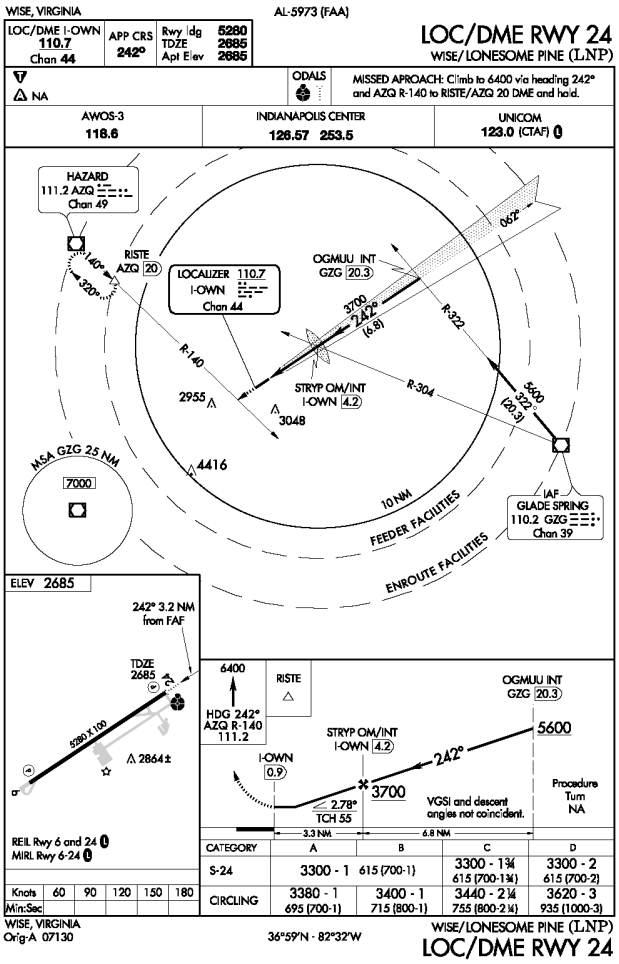
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	Partial
Approach Lights	Recommended	Non-Standard
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Lonesome Pine (LNP)

Wise, Virginia

Procedure Overview



LOC/DME RWY 24

FAA PROCEDURE DATA		
Critical Obstacle:	2840	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:	200	**see note 2**
Rounding Adjustment:	10	
Minimum Descent Altitude / Decision Height:	3300	

Note 1: 100' Tree

Note 2: pilot request

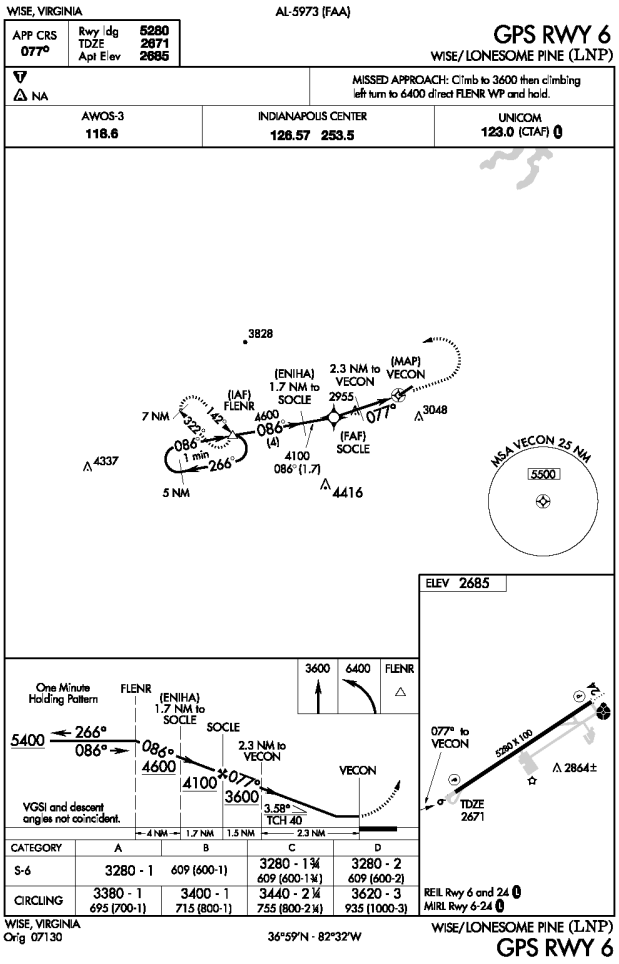
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	1 SM	**KNOWN DEFICIENCIES**
	REQUIRED	
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	Partial
Approach Lights	Recommended	Non-Standard
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Lonesome Pine (LNP)

Wise, Virginia

Procedure Overview



GPS RWY 6

FAA PROCEDURE DATA		
Critical Obstacle:	2817	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:	200	**see note 2**
Rounding Adjustment:	13	
Minimum Descent Altitude / Decision Height:	3280	

Note 1: 100' Tree

Note 2: pilot request

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	Partial
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Recommendations

RNAV (GPS) RWY 6		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Critical Obstacle Field verify critical obstacle to change accuracy code from "D" to "A" or 50 feet to 3 feet.	Minimum Descent Altitude (MDA) may be reduced by 40 to 60 feet.	Less than $10,000

RNAV (GPS) RWY 24		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a

LOC / DME RWY 24		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Approach Lighting System Install MALSR for Runway 24. See Overall Recommendations.	Lowers landing visibility minimum to as low as 3/4 statute mile for localizer approach and 1/2 statute mile for ILS approach.	$1,250,000 (duplicate)
Glide Slope Install glide slope to complete ILS RWY 24.	Improve all-weather capability of the runway and airport.	Underway
Visibility Minimum Upon installation of the glide slope, the visibility minimum is reduced from 1 statute mile to 1/2 statute mile and different airport design standards apply.	Lower landing visibility minimum.	See Overall Recommendations

Procedure Recommendations

GPS RWY 6		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a

Louisa County/Freeman Field (LKU)

Louisa, Virginia

AIRPORT INFORMATION	
ROLE / CLASSIFICATION INFORMATION	
VATSP Classfication (2008):	General Aviation Community
NPIAS Role (2008):	General Aviation
Study Classification:	General Aviation Community

ACTIVITY INFORMATION	
Based Aircraft (2007):	55
Annual Operations (2020):	33892
Annual Enplanements (2020):	n/a
DEVELOPMENT INFORMATION (2008)	
Critical Airport Reference Code (Existing):	B-II
Critical Airport Reference Code (Proposed):	B-II
Airport Layout Plan (Original):	March, 2006
Airport Layout Plan (Revision):	n/a

Proposed Development (from ALD):
- Extend RWY 9 (700')
- Install ODALS (RWY 27)

AERONAUTICAL SURVEY INFORMATION

Runway End	Survey Type	Survey Date
all	Photoslope	2001

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS	
Available Weather Reporting:	AWOS-III (P)
Common Traffic Advisory Frequency:	122.725
Clearance Delivery:	Phone

Nearby Navigational Aids:

LOUISA	NDB	382	IQK	272°/ 5.3 NM TO FIELD
GORDONSVILLE	VORTAC	115.6	GVE	097°/ 8.6 NM TO FIELD
FLAT ROCK	VORTAC	113.3	FAK	353°/ 29.7 NM TO FIELD

Louisa County/Freeman Field (LKU)

Louisa, Virginia

Instrument Approach Procedure Summary

Minimums listed are Category B

EXISTING PROCEDURES		
RUNWAY 27		
LOC RWY 27	780 - 1 (287)	Amdt 1
NDB OR GPS RWY 27	1180 - 1 (687)	Orig-B

PROCEDURES PROPOSED AS PART OF STUDY
RNAV (GPS) RWY 27 - LNAV
RNAV (GPS) RWY 27 - LPV
RNAV (GPS) RWY 9 - LNAV

VISIBILITY CHANGES PROPOSED AS PART OF STUDY	
none	

REVIEWER COMMENTS

A satellite based approach to RWY 9 is recommended to meet System Benchmarks. The Airport Sponsor completed the requested informational survey.

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 9 27 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	B-II	B-II
Runway Dimensions (Length x Width in ft):	4301 x 100	5000 x 100
Runway to Taxiway Separation (feet):	240	240
Runway Lighting:	MIRL	MIRL
RUNWAY 9		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 700 x 1000	500 x 700 x 1000
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	PAPI; REILs	PAPI: REILs
RUNWAY 27		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 700 x 1000	500 x 700 x 1000
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	PAPI; REILs	PAPI; ODALS

Louisa County/Freeman Field (LKU)

Louisa, Virginia

System Benchmarks

General Aviation Community			
Best Approach (Primary Runway End)			
BENCHMARK		**RUNWAY 27**	
Approach:	Ground-based	☑ meets	LOC RWY 27
Ceiling:	500 AGL	☑ meets	
Visibility:	1 statute mile	☑ meets	
Approach:	LNAV	☐ meets	NDB OR GPS RWY 27
Ceiling:	400 AGL	☐ meets	
Visibility:	1 statute mile	☑ meets	
Equipment:	REILs, MIRLs, PAPI	☑ meets	
Secondary Approach (Different Runway End)			
BENCHMARK		**RUNWAY 9**	
Approach:		☐ meets	n/a (no ground-based approach available)
Ceiling:		☐ meets	
Visibility:		☐ meets	
Approach:	LNAV	☐ meets	n/a (no satellite-based approach available)
Ceiling:	500 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Equipment:	REILs, MIRLs, PAPI	☑ meets	

Additional Requirements			
Weather:	Normally on-field, 24/7, data-linked	☑ meets	
Access to ATC Clearance:	RTR or GCO	☐ meets	
ADS-B Coverage:	1000 AGL	☐ meets	

Overall Recommendations

GENERAL		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Weather Reporting Upgrade existing AWOS-III to include lightning and freezing rain sensor.	Improves information available to pilot.	$60,000
Communications Install a Ground Communication Outlet (GCO) directly with Potomac Approach.	Provides direct communication with approach control via radio and an "on-demand" telephone land line link. Used by aircraft on ground for obtaining or canceling IFR clearances.	$20,000
Communications Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	Improves pilot/controller communications and clearance delivery process.	Less than $5,000
Data link Provide ADS-B coverage at 1000 AGL or lower.	Provides traffic surveillance, terrain avoidance, weather data, etc. Crucial component for Next Generation Air Transportation System.	Unknown

RUNWAY 9		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Precision Approach Path Indicator Upgrade Runway 9 PAPI from a 2 box to a 4 box unit.	Provides improved visual vertical descent guidance information during the approach to the runway.	$20,000
Aeronautical Survey Request / complete aeronautical survey to enable development of LNAV approach to Runway 9.	Provides survey data for instrument approach procedures.	$50,000
New Procedure Request development of RNAV (GPS) RWY 9 Approach with LNAV landing minimums.	Improve all-weather capability of the runway and airport and eliminate requirement for circle-to-land operations. Runway 9 minimums may be reduced to as low as 880-1 (387) or a reduction of 240 feet.	No equipment cost

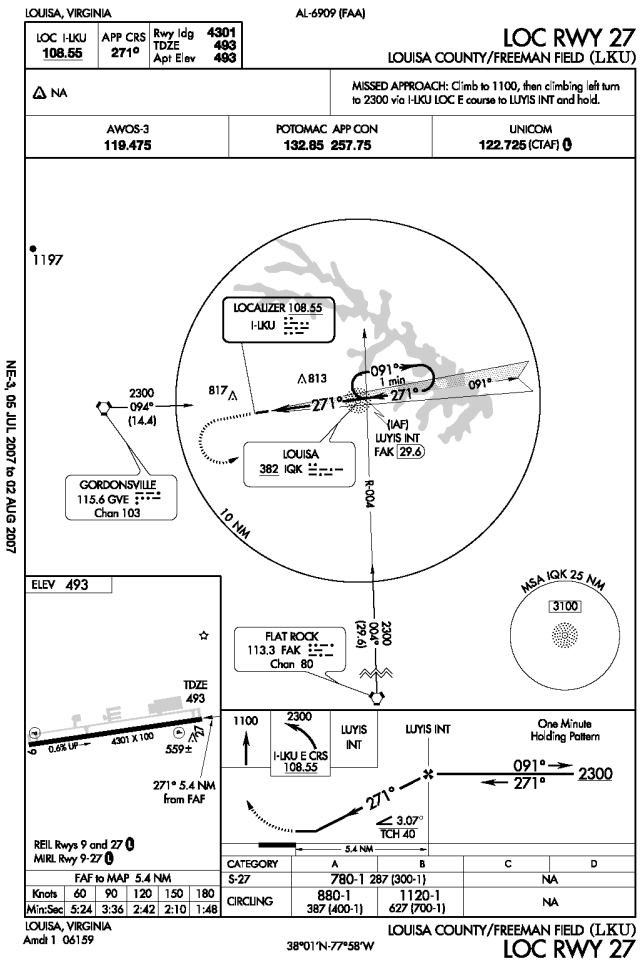
Overall Recommendations

RUNWAY 27		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions (tree).	Standards.	Varies
Precision Approach Path Indicator Upgrade Runway 27 PAPI from a 2 box to a 4 box unit.	Provides improved visual vertical descent guidance information during the approach to the runway.	$20,000
Aeronautical Survey Request / complete aeronautical survey to enable development of LNAV and LPV approaches to Runway 27.	Provides survey data for instrument approach procedures.	$50,000 (duplicate)
New Procedure Request development of RNAV (GPS) RWY 27 Approach with LPV and LNAV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost

Louisa County/Freeman Field (LKU)

Louisa, Virginia

Procedure Overview



LOC RWY 27

FAA PROCEDURE DATA		
Critical Obstacle:	529	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	1	
Minimum Descent Altitude / Decision Height:	780	

Note 1: 60' Tree

Note 2:

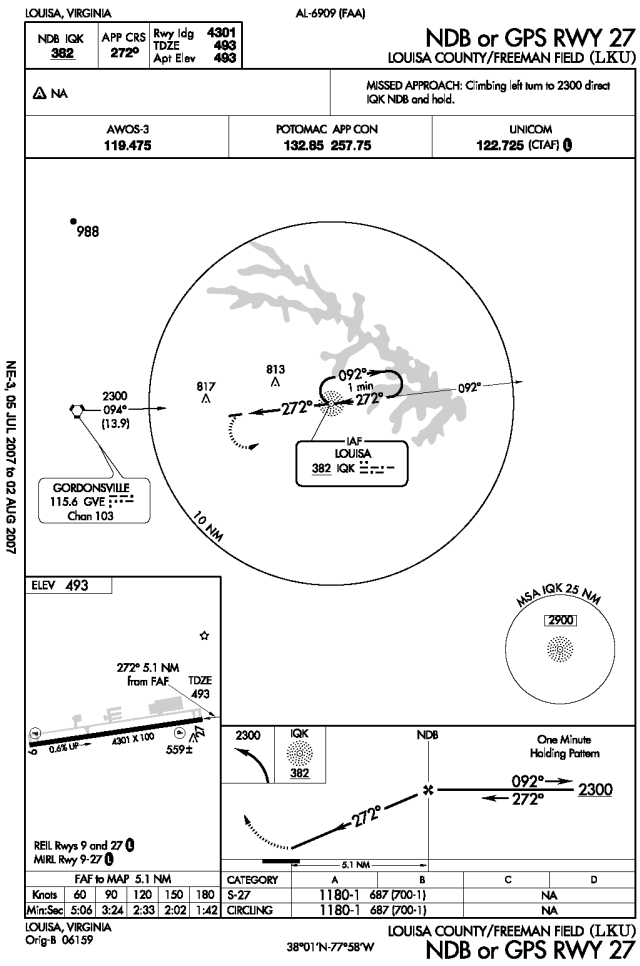
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Overview



NDB OR GPS RWY 27

FAA PROCEDURE DATA		
Critical Obstacle:	813	**see note 1**
Required Obstacle Clearance:	300	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:	50	
Other Adjustment:		**see note 2**
Rounding Adjustment:	17	
Minimum Descent Altitude / Decision Height:	1180	

Note 1: Tower

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM REQUIRED	KNOWN DEFICIENCIES
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Recommendations

LOC RWY 27		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Distance Measuring Equipment Install Distance Measuring Equipment (DME). Co-locate with the localizer.	Improves pilot's situational awareness and simplifies procedure.	$100,000
Procedure Review (Approach Category) Request addition of Approach Category C and D minimums to the procedure.	Improves accessibility of the airport.	No equipment cost

NDB OR GPS RWY 27		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Procedure Review Request procedure be updated to separate GPS approach from ground-based approach.	Procedure clarity.	No equipment cost

Lunenburg Municipal (W31)

Kenbridge, Virginia

AIRPORT INFORMATION	
ROLE / CLASSIFICATION INFORMATION	
VATSP Classfication (2008):	Local Service
NPIAS Role (2008):	n/a
Study Classification:	Local Service

ACTIVITY INFORMATION	
Based Aircraft (2007):	1
Annual Operations (2020):	417
Annual Enplanements (2020):	n/a
DEVELOPMENT INFORMATION (2008)	
Critical Airport Reference Code (Existing):	B-I (small)
Critical Airport Reference Code (Proposed):	B-I (small)
Airport Layout Plan (Original):	February, 1997
Airport Layout Plan (Revision):	n/a

Proposed Development (from ALD):
- Extend RWY (800')
- Widen RWY (60')

AERONAUTICAL SURVEY INFORMATION

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS	
Available Weather Reporting:	None
Common Traffic Advisory Frequency:	122.7
Clearance Delivery:	Phone

Nearby Navigational Aids:

LAWRENCEVILLE	VORTAC	112.9	LVL	310° / 16.0 NM TO FIELD
BLACKSTONE	NDB	326	BKT	223° / 12.1 NM TO FIELD

Lunenburg Municipal (W31)

Kenbridge, Virginia

REVIEWER COMMENTS

No published instrument approach procedures. The Airport Sponsor completed the requested informational survey.

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 2 20 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	B-I (small)	B-I (small)
Runway Dimensions (Length x Width in ft):	3000 x 50	3800 x 60
Runway to Taxiway Separation (feet):	none	210
Runway Lighting:	LIRL	MIRL
RUNWAY 2		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	250 x 450 x 1000	250 x 450 x 1000
Runway Markings:	Visual	Visual
Available Visual Approach Aids:	APAP	PAPI; REILs
RUNWAY 20		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	250 x 450 x 1000	250 x 450 x 1000
Runway Markings:	Visual	Non-Precision
Available Visual Approach Aids:	APAP	PAPI; REILs

Luray Caverns (W45)

Luray, Virginia

AIRPORT INFORMATION	
ROLE / CLASSIFICATION INFORMATION	
VATSP Classfication (2008):	General Aviation Community
NPIAS Role (2008):	General Aviation
Study Classification:	General Aviation Community

ACTIVITY INFORMATION	
Based Aircraft (2007):	15
Annual Operations (2020):	3754
Annual Enplanements (2020):	n/a

DEVELOPMENT INFORMATION (2008)	
Critical Airport Reference Code (Existing):	B-I
Critical Airport Reference Code (Proposed):	B-II (small)
Airport Layout Plan (Original):	October, 2006
Airport Layout Plan (Revision):	n/a

Proposed Development (from ALD):

- Upgrade to B-II small
- Extend RWY 22 (1275')

AERONAUTICAL SURVEY INFORMATION

Runway End	Survey Type	Survey Date
all	Photoslope	2001

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS	
Available Weather Reporting:	None
Common Traffic Advisory Frequency:	122.8
Clearance Delivery:	Phone

Nearby Navigational Aids:

LINDEN	VORTAC	114.3	LDN	237°/ 17.8 NM TO FIELD
CAVERNS	NDB	245	LUA	224°/ 2.4 NM TO FIELD
CASANOVA	VORTAC	116.3	CSN	279°/ 29.8 NM TO FIELD

Luray Caverns (W45)

Luray, Virginia

Instrument Approach Procedure Summary

Minimums listed are Category B

EXISTING PROCEDURES		
CIRCLING		
NDB OR GPS-A	2320 - 1 1/4 (1417)	Amdt 5
VOR/DME-B	2320 - 1 1/4 (1417)	Amdt 2
RUNWAY 22		
GPS RWY 22	2260 - 1 1/4 (1358)	Amdt 1

PROCEDURES PROPOSED AS PART OF STUDY
RNAV (GPS) RWY 22 - LPV or LP
RNAV (GPS) RWY 4 - LNAV
RNAV (GPS) RWY 4 - LPV or LP

VISIBILITY CHANGES PROPOSED AS PART OF STUDY	
RUNWAY 22:	1 1/4 SM to 1 SM

REVIEWER COMMENTS

A new approach to Runway 4 would eliminate the requirement for circle-to-land operations when the wind and weather conditions favor landing to the northeast. The current remote altimeter setting source adjustment is 571 feet. This adjustment to the landing minimum (ceiling) can be eliminated with the installtion of a local altimeter source. The Airport Sponsor completed the requested informational survey.

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 6 24 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	B-I	B-II (small)
Runway Dimensions (Length x Width in ft):	3125 x 75	4400 x 75
Runway to Taxiway Separation (feet):	none	240
Runway Lighting:	MIRL	MIRL
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:		
Runway Markings:		
Available Visual Approach Aids:		

Luray Caverns (W45)

Luray, Virginia

System Benchmarks

General Aviation Community			
Best Approach (Primary Runway End)			
BENCHMARK		**RUNWAY 22**	
Approach:	Ground-based	☐ meets	n/a (no ground-based approach available)
Ceiling:	500 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Approach:	LNAV	☐ meets	GPS RWY 22
Ceiling:	400 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Equipment:	REILs, MIRLs, PAPI	☐ meets	
Secondary Approach (Different Runway End)			
BENCHMARK		**RUNWAY 4**	
Approach:		☐ meets	n/a (no ground-based approach available)
Ceiling:		☐ meets	
Visibility:		☐ meets	
Approach:	LNAV	☐ meets	n/a (no satellite-based approach available)
Ceiling:	500 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Equipment:	REILs, MIRLs, PAPI	☐ meets	

Additional Requirements			
Weather:	Normally on-field, 24/7, data-linked	☐ meets	
Access to ATC Clearance:	RTR or GCO	☐ meets	
ADS-B Coverage:	1000 AGL	☐ meets	

Overall Recommendations

GENERAL		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Communications Install a Ground Communication Outlet (GCO) directly with Washington Center.	Provides direct communication with approach control via radio and an "on-demand" telephone land line link. Used by aircraft on ground for obtaining or canceling IFR clearances.	$20,000
Altimeter Source / Weather Reporting Install AWOS-III.	Provides local altimeter source and weather reporting.	$150,000
Communications Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	Improves pilot/controller communications and clearance delivery process.	Less than $5,000
Data link Provide ADS-B coverage at 1000 AGL or lower.	Provides traffic surveillance, terrain avoidance, weather data, etc. Crucial component for Next Generation Air Transportation System.	Unknown

RUNWAY 4 22		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Airfield Lighting Control Change control sequence and/or facility directory note for MIRLs to be preset on low intensity with higher intensity activated on CTAF.	Provides visibilty of landing environment during night and adverse weather conditions even during times of aircraft equipment failure or pilot control system malfunction.	Less than $10,000

Overall Recommendations

RUNWAY 4		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstruction (tree).	Standards.	Varies
Runway End Identifier Lights Install REILs for Runway 4.	Improves pilot's ability to detect the landing environment.	$50,000
Precision Approach Path Indicator Install 4-box PAPI for Runway 4.	Provides visual vertical descent guidance information during the approach to the runway.	$70,000
Aeronautical Survey Request / complete aeronautical survey to enable development of LNAV and LPV approaches to Runway 4.	Provides survey data for instrument approach procedures.	$50,000
New Procedure Request development of RNAV (GPS) RWY 4 Approach with LP or LPV and LNAV landing minimums.	Improve all-weather capability of the runway and airport and eliminate requirement for circle-to-land operations. An LPV approach may support minimums as low as 1300-1 (308) or a reduction of 1020 feet.	No equipment cost

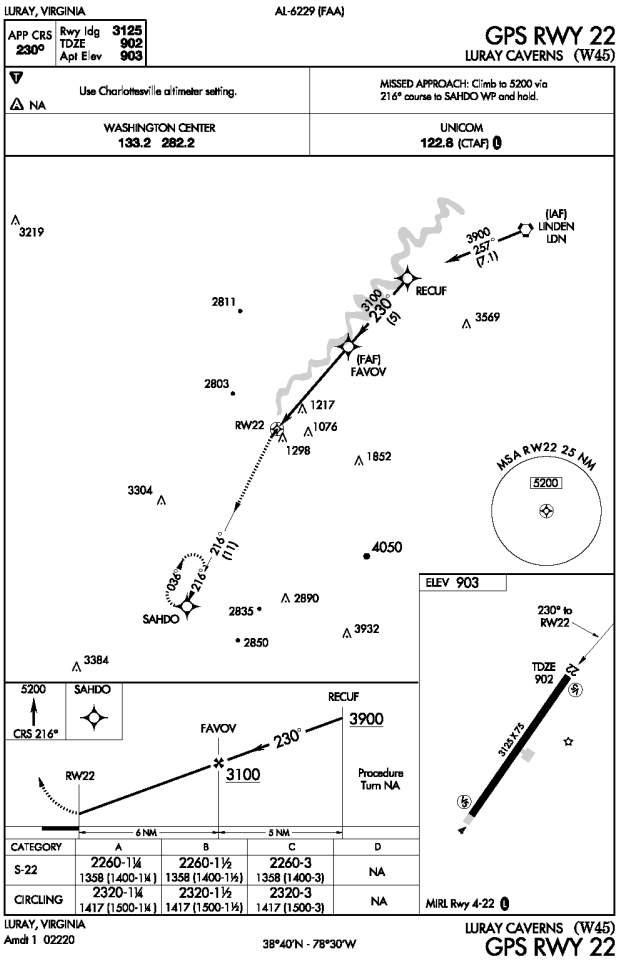
Overall Recommendations

RUNWAY 22		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstruction (tree).	Standards.	Varies
Runway End Identifier Lights Install REILs for Runway 22.	Improves pilot's ability to detect the landing environment.	$50,000
Precision Approach Path Indicator Install 4-box PAPI for Runway 22.	Provides visual vertical descent guidance information during the approach to the runway.	$70,000
Aeronautical Survey Request / complete aeronautical survey to enable development of LP or LPV approach to Runway 22.	Provides survey data for instrument approach procedures.	$50,000 (duplicate)
New Procedure Request development of RNAV (GPS) RWY 22 Approach with LP or LPV landing minimums.	Improve all-weather capability of the runway and airport. An LP approach may support minimums as low as 1280-1 (378) or a reduction of 980 feet.	No equipment cost

Luray Caverns (W45)

Luray, Virginia

Procedure Overview



GPS RWY 22

FAA PROCEDURE DATA		
Critical Obstacle:	1215	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:	571	
Accuracy Code Adjustment:	50	
Other Adjustment:	158	**see note 2**
Rounding Adjustment:	16	
Minimum Descent Altitude / Decision Height:	2260	

Note 1: Tower

Note 2: pilot request, math error

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

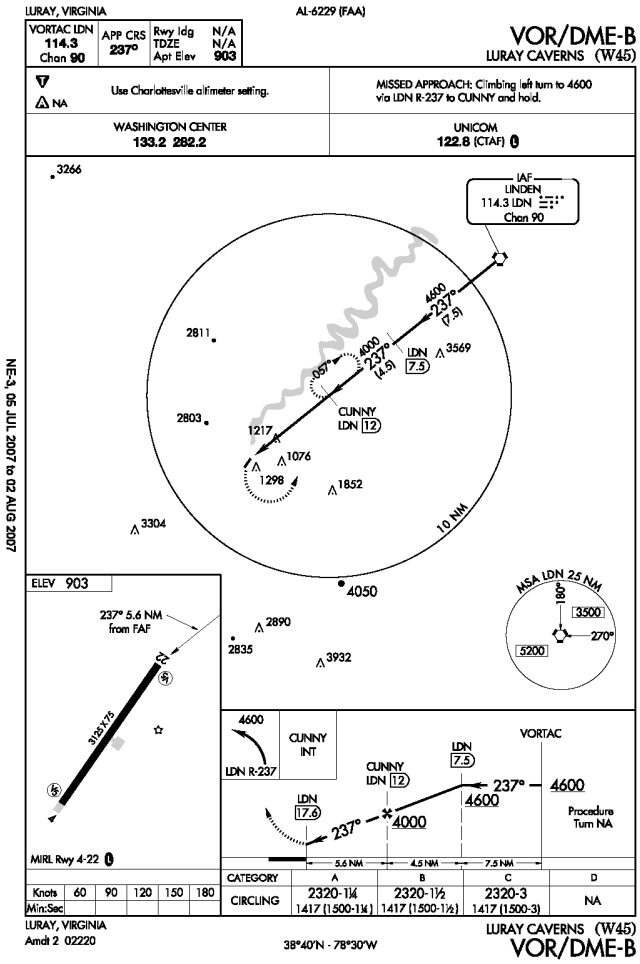
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	>1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	Yes
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	Yes
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Luray Caverns (W45)

Luray, Virginia

Procedure Overview



VOR/DME-B

FAA PROCEDURE DATA		
Critical Obstacle:	1298	**see note 1**
Required Obstacle Clearance:	300	
Remote Altimeter Adjustment:	571	
Accuracy Code Adjustment:	50	
Other Adjustment:	100	**see note 2**
Rounding Adjustment:	1	
Minimum Descent Altitude / Decision Height:	2320	

Note 1: Tower

Note 2: pilot request

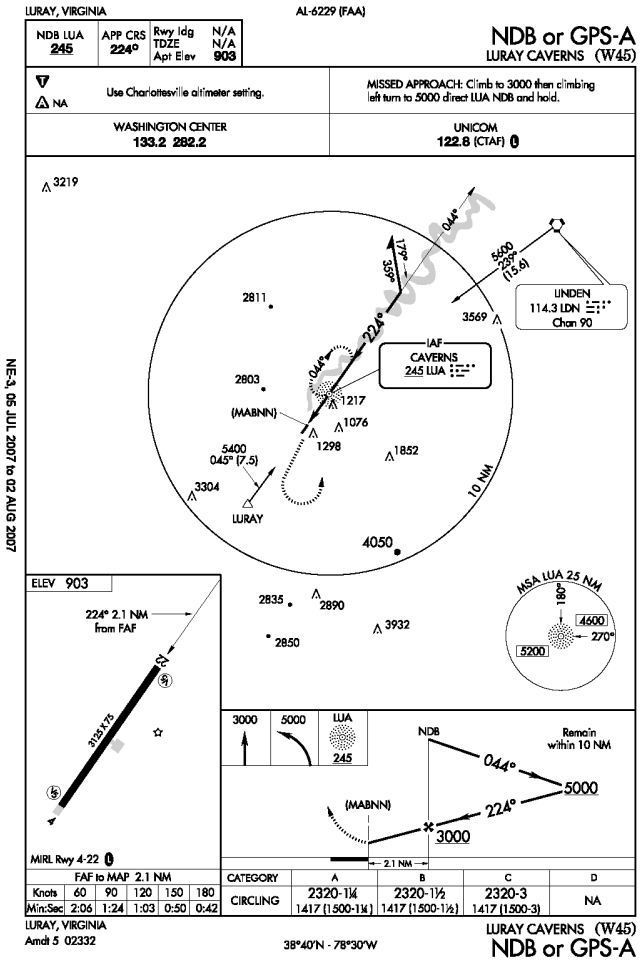
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	CIRCLING	**KNOWN DEFICIENCIES**
	REQUIRED	
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Recommended	None
Minimum Runway Length	3,200 ft	Yes
Runway Markings	Visual (Basic)	None
Holding Position Signs and Markings	Visual (Basic)	None
Runway Edge Lights	MIRL / LIRL (for night minima only)	None
Parallel Taxiway	Recommended	Yes
Approach Lights	Not Required	None
Runway Design Standards	Not Required	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-2, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Luray Caverns (W45)

Luray, Virginia

Procedure Overview



NDB OR GPS-A

FAA PROCEDURE DATA		
Critical Obstacle:	1298	**see note 1**
Required Obstacle Clearance:	300	
Remote Altimeter Adjustment:	571	
Accuracy Code Adjustment:	50	
Other Adjustment:	100	**see note 2**
Rounding Adjustment:	1	
Minimum Descent Altitude / Decision Height:	2320	

Note 1: Tower

Note 2: pilot request

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	CIRCLING	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Recommended	None
Minimum Runway Length	3,200 ft	Yes
Runway Markings	Visual (Basic)	None
Holding Position Signs and Markings	Visual (Basic)	None
Runway Edge Lights	MIRL / LIRL (for night minima only)	None
Parallel Taxiway	Recommended	Yes
Approach Lights	Not Required	None
Runway Design Standards	Not Required	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-2, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Recommendations

GPS RWY 22		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Procedure Review Request procedure title be updated to RNAV (GPS) RWY 22 format.	Procedure clarity.	No equipment cost
Altimeter Source / Weather Reporting Install AWOS-III and request FAA re-evaluation of remote altimeter setting source penalty. See Overall Recommendations.	Minimum Descent Altitude (MDA) may be reduced by 560 to 580 feet by eliminating the remote altimeter setting source (RASS) adjustment.	$150,000 (duplicate)
Critical Obstacle Field verify critical obstacle to change accuracy code from "D" to "A" or 50 feet to 3 feet.	Minimum Descent Altitude (MDA) may be reduced by 40 to 60 feet.	Less than $10,000
Procedure Review (Approach Category) Request deletion of Approach Category C minimums from the procedure.	Better reflects capabilities of airport infrastructure and design standards.	No equipment cost

VOR / DME B		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Altimeter Source / Weather Reporting Install AWOS-III and request FAA re-evaluation of remote altimeter setting source penalty. See Overall Recommendations.	Minimum Descent Altitude (MDA) may be reduced by 560 to 580 feet by eliminating the remote altimeter setting source (RASS) adjustment.	$150,000 (duplicate)
Procedure Review (Approach Category) Request deletion of Approach Category C minimums from the procedure.	Better reflects capabilities of airport infrastructure and design standards.	No equipment cost

Procedure Recommendations

NDB OR GPS A		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Altimeter Source / Weather Reporting Install AWOS-III and request FAA re-evaluation of remote altimeter setting source penalty. See Overall Recommendations.	Minimum Descent Altitude (MDA) may be reduced by 560 to 580 feet by eliminating the remote altimeter setting source (RASS) adjustment.	$150,000 (duplicate)
Critical Obstacle Field verify critical obstacle to change accuracy code from "D" to "A" or 50 feet to 3 feet.	Minimum Descent Altitude (MDA) may be reduced by 40 to 60 feet.	Less than $10,000
Procedure Review (Approach Category) Request deletion of Approach Category C minimums from the procedure.	Better reflects capabilities of airport infrastructure and design standards.	No equipment cost

Lynchburg Regional/Preston Glenn Field (LYH)

Lynchburg, Virginia

AIRPORT INFORMATION	
ROLE / CLASSIFICATION INFORMATION	
VATSP Classfication (2008):	Commercial Service
NPIAS Role (2008):	Primary, Non Hub
Study Classification:	Commercial Service (<200k enplanements)

ACTIVITY INFORMATION	
Based Aircraft (2007):	88
Annual Operations (2020):	86993
Annual Enplanements (2020):	119094

DEVELOPMENT INFORMATION (2008)	
Critical Airport Reference Code (Existing):	C-III
Critical Airport Reference Code (Proposed):	n/a
Airport Layout Plan (Original):	July, 2001
Airport Layout Plan (Revision):	February, 2006

Proposed Development (from ALD):

- Install ODALS (RWY 22)

AERONAUTICAL SURVEY INFORMATION

Runway End	Survey Type	Survey Date
all	Photoslope	2001
all	OC-LYH 499	1996
35	SUPLC	1996
17	SUPLC	1996
21	C	1996
3	PIR	1996
4	PIR	2007

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS	
Available Weather Reporting:	ASOS
Common Traffic Advisory Frequency:	127.65
Clearance Delivery:	Direct

Nearby Navigational Aids:

LYNCHBURG	VORTAC	109.2	LYH	027°/ 4.6 NM TO FIELD
BOJAR	NDB	385	LY	036°/ 4.3 NM TO FIELD

Lynchburg Regional/Preston Glenn Field (LYH)

Lynchburg, Virginia

Instrument Approach Procedure Summary

Minimums listed are Category B

EXISTING PROCEDURES		
RUNWAY 22		
GPS RWY 22	1620 - 1 (682)	Orig B
VOR/DME RWY 22	1740 - 1 (802)	Amdt 8B
RUNWAY 4		
ILS RWY 4 - ILS	1118 - 2400 (200)	Amdt 15A
ILS RWY 4 - LOC	1320 - 2400 (402)	Amdt 15A
VOR OR GPS RWY 4	1400 - 2400 (482)	Amdt 11D

PROCEDURES PROPOSED AS PART OF STUDY
LOC RWY 22
RNAV (GPS) RWY 17 - LNAV
RNAV (GPS) RWY 22 - LPV
RNAV (GPS) RWY 35 - LNAV
RNAV (GPS) RWY 4 - LNAV
RNAV (GPS) RWY 4 - LPV

VISIBILITY CHANGES PROPOSED AS PART OF STUDY	
RUNWAY 22:	1 SM to 3/4 SM

REVIEWER COMMENTS

Improvements to the RWY 4 and RWY 22 satellite-based approaches are recommended. Runway 17-35 is not currently served by instrument approach procedures. The Study recommends a reduction in landing visibility minimums. Additional information regarding the estimated impacts and costs associated with the visibility changes is included in Appendix E. The Airport Sponsor completed the requested informational survey.

SPONSOR COMMENTS

Sponsor notes that RNAV (GPS) RWY 4 and RNAV (GPS) RWY 22 approaches have been published (subsequent to Study inventory).

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 17 35 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	B-II	B-II
Runway Dimensions (Length x Width in ft):	3386 x 75	3386 x 75
Runway to Taxiway Separation (feet):	227	227
Runway Lighting:	MIRL	MIRL
RUNWAY 17		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	250 x 450 x 1000	250 x 450 x 1000
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	PAPI; REILs	PAPI; REILs
RUNWAY 35		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	250 x 450 x 1000	250 x 450 x 1000
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	PAPI; REILs	PAPI; REILs
RUNWAY 4 22 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	C-III	C-III
Runway Dimensions (Length x Width in ft):	7100 x 150	7100 x 150
Runway to Taxiway Separation (feet):	400	400
Runway Lighting:	HIRL	HIRL
RUNWAY 4		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	1000 x 1750 x 2500	1000 x 1750 x 2500
Runway Markings:	Precision	Precision
Available Visual Approach Aids:	PAPI; MALSR	PAPI; MALSR
RUNWAY 22		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 1010 x 1700	1000 x 1425 x 1700
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	VASI; REILs	PAPI; MALS

Lynchburg Regional/Preston Glenn Field (LYH)

Lynchburg, Virginia

System Benchmarks

Commercial Service (<200k enplanements)			
Best Approach (Primary Runway End)			
BENCHMARK		**RUNWAY 4**	
Approach:	ILS CAT I	☑ meets	ILS RWY 4 - ILS
Ceiling:	200 AGL	☑ meets	
Visibility:	2400 RVR	☑ meets	
Approach:	LPV	☐ meets	VOR OR GPS RWY 4
Ceiling:	200 AGL	☐ meets	
Visibility:	2400 RVR	☑ meets	
Equipment:	MALSR, HIRLs, RVR, PAPI	☑ meets	
Secondary Approach (Different Runway End)			
BENCHMARK		**RUNWAY 22**	
Approach:	Ground-based	☑ meets	VOR/DME RWY 22
Ceiling:	400 AGL	☐ meets	
Visibility:	3/4 staute mile	☐ meets	
Approach:	LPV	☐ meets	GPS RWY 22
Ceiling:	250 AGL	☐ meets	
Visibility:	3/4 statute mile	☐ meets	
Equipment:	MALS, HIRLs, PAPI	☐ meets	existing HIRLs, PAPI
All Ends of Instrument Runways			
BENCHMARK		**RUNWAY 35**	
Approach:	none	☐ meets	n/a (no ground-based approach available)
Ceiling:		☐ meets	
Visibility:		☐ meets	
Approach:	LPV	☐ meets	n/a (no satellite-based approach available)
Ceiling:	400 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Equipment:	PAPIs, MIRLs, REILs	☑ meets	

Lynchburg Regional/Preston Glenn Field (LYH)

Lynchburg, Virginia

BENCHMARK		RUNWAY 17	
Approach:	none	☐ meets	n/a (no ground-based approach available)
Ceiling:		☐ meets	
Visibility:		☐ meets	
Approach:	LPV	☐ meets	n/a (no satellite-based approach available)
Ceiling:	400 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Equipment:	PAPIs, MIRLs, REILs	☑ meets	

Weather:	on-field, 24/7, data-linked	☑ meets	
Access to ATC Clearance:	Direct or RTR	☑ meets	
ADS-B Coverage:	On ground	☐ meets	

Overall Recommendations

GENERAL		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Communications Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	Improve pilot/controller communications and clearance delivery process when ATCT is closed.	Less than $5,000
Data link Provide ADS-B coverage while on the ground.	Provides traffic surveillance, terrain avoidance, weather data, etc. Crucial component for Next Generation Air Transportation System.	$100,000
Local Area Augmentation System (LAAS) Provide LAAS coverage to augment existing global positioning system.	Provides enhanced signal accuracy.	Unknown

RUNWAY 4 22		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Airfield Lighting Control Change facility directory note to reflect that HIRLs are preset on low intensity (with higher intensity activated on CTAF) once ATCT closed.	Provides visibilty of landing environment during night and adverse weather conditions even during times of aircraft equipment failure or pilot control system malfunction.	No equipment cost

RUNWAY 4		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Aeronautical Survey Request / complete aeronautical survey to enable development of LNAV and LPV approaches to Runway 4.	Provides survey data for instrument approach procedures.	Completed 2007
New Procedure Request development of RNAV (GPS) RWY 4 Approach with LPV and LNAV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost

Overall Recommendations

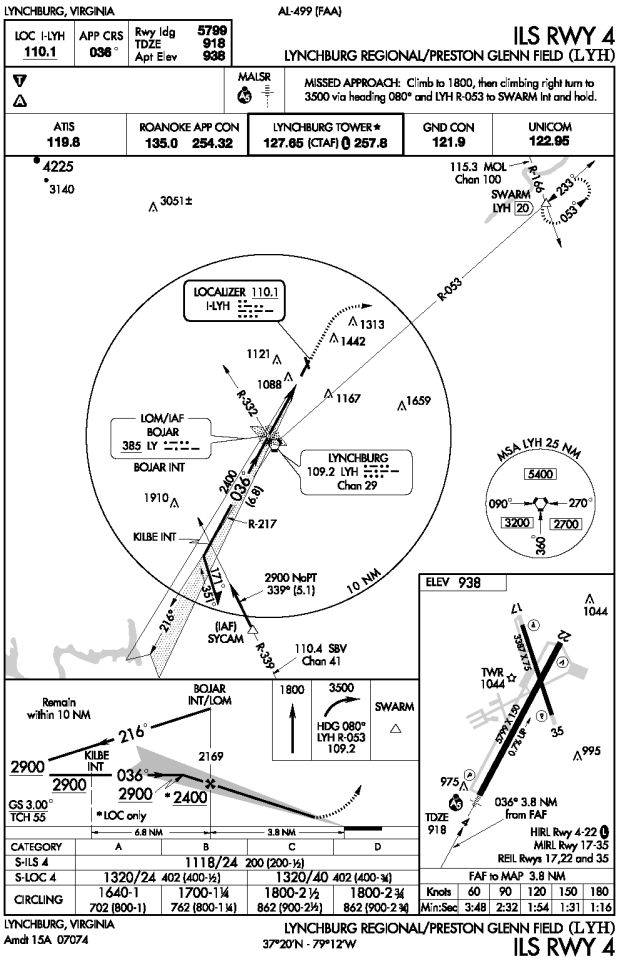
RUNWAY 22		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Precision Approach Path Indicator Upgrade Runway 22 VASI to a 4-box PAPI.	Provides improved visual vertical descent guidance information during the approach to the runway.	$200,000
Approach Lighting System Install MALS for Runway 22.	Improves pilot's ability to detect the landing environment.	$650,000
Visibility Minimum Upon installation of approach lighting system and subsequent acceptance of visibility credit, different design standards apply (less than 1 mile).	Lower landing visibility minimum.	$900,000
Aeronautical Survey Request / complete aeronautical survey to enable development of LNAV and LPV approaches to Runway 22.	Provides survey data for instrument approach procedures.	Underway
New Procedure Request development of RNAV (GPS) RWY 22 Approach with LPV landing minimums.	Improve all-weather capability of the runway and airport. Minimums for a LOC or LP approach to Runway 22 could be as low as 1300-3/4 (362) or a reduction of 320 feet.	No equipment cost

RUNWAY 17		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Aeronautical Survey Request / update aeronautical survey to enable development of LNAV approach to Runway 17.	Provides survey data for instrument approach procedures.	$30,000
New Procedure Request development of RNAV (GPS) RWY 17 Approach with LNAV landing minimums.	Improve all-weather capability of the runway and airport and eliminate requirement for circle-to-land operations.	No equipment cost

Overall Recommendations

RUNWAY 35		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Aeronautical Survey Request / update aeronautical survey to enable development of LNAV approach to Runway 35.	Provides survey data for instrument approach procedures.	$30,000 (duplicate)
New Procedure Request development of RNAV (GPS) RWY 35 Approach with LNAV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost

Procedure Overview



ILS RWY 4 - ILS

FAA PROCEDURE DATA	
Critical Obstacle:	**see note 1**
Required Obstacle Clearance:	
Remote Altimeter Adjustment:	
Accuracy Code Adjustment:	
Other Adjustment:	**see note 2**
Rounding Adjustment:	
Minimum Descent Altitude / Decision Height:	1118

Note 1: ASC

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

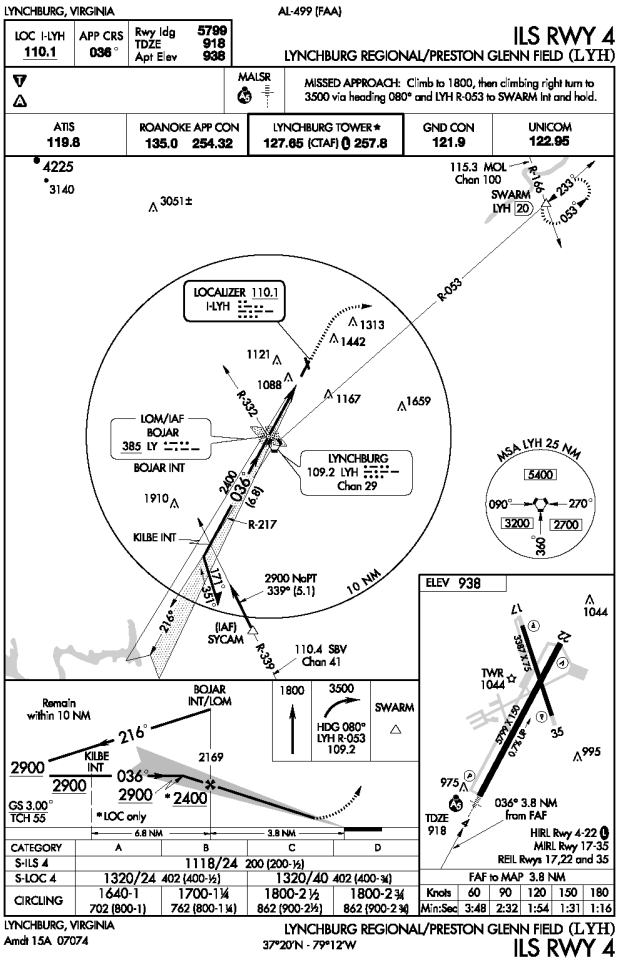
TABLE A16-1A - PRECISION INSTRUMENT APPROACH REQUIREMENTS

	<3/4 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	34:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	4,200 ft (Paved)	None
Runway Markings	Precision	None
Holding Position Signs and Markings	Precision	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	MALSR, SSALR, or ALSF	None
Runway Design Standards	<3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 9, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Lynchburg Regional/Preston Glenn Field (LYH)

Lynchburg, Virginia

Procedure Overview



ILS RWY 4 - LOC

FAA PROCEDURE DATA		
Critical Obstacle:	1022	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:	40	**see note 2**
Rounding Adjustment:	8	
Minimum Descent Altitude / Decision Height:	1320	

Note 1: Tower

Note 2: missed approach segment

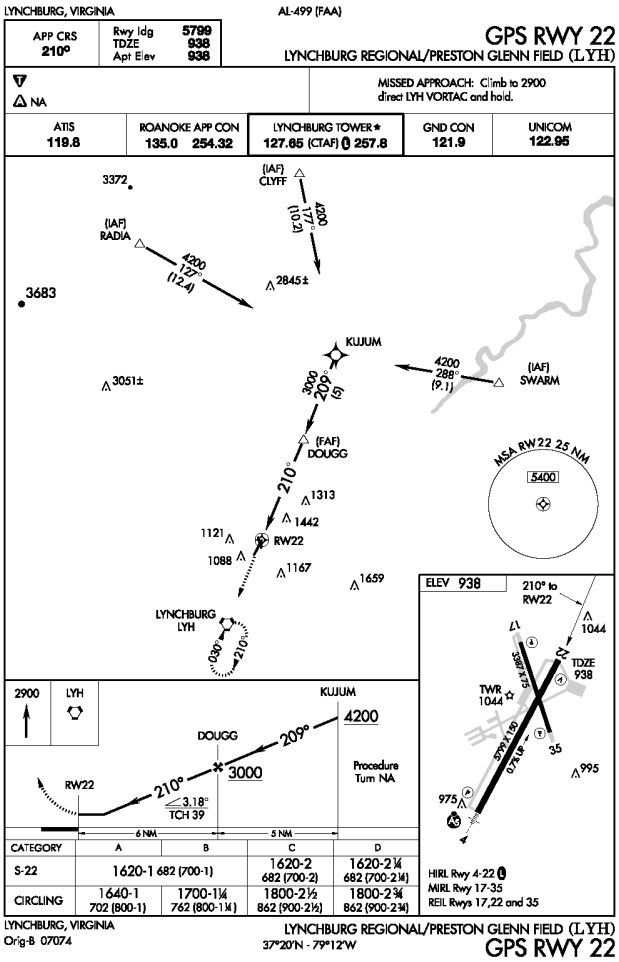
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	<3/4 SM	**KNOWN DEFICIENCIES**
	REQUIRED	
TERPS Paragraph 251	34:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	4,200 ft (Paved)	None
Runway Markings	Precision	None
Holding Position Signs and Markings	Precision	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	MALSR, SSALR, or ALSF Required	None
Runway Design Standards	<3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 9, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Lynchburg Regional/Preston Glenn Field (LYH)

Lynchburg, Virginia

Procedure Overview



GPS RWY 22

FAA PROCEDURE DATA		
Critical Obstacle:	1442	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:	-86	**see note 2**
Rounding Adjustment:	14	
Minimum Descent Altitude / Decision Height:	1620	

Note 1: Tower

Note 2: secondary area adjustment

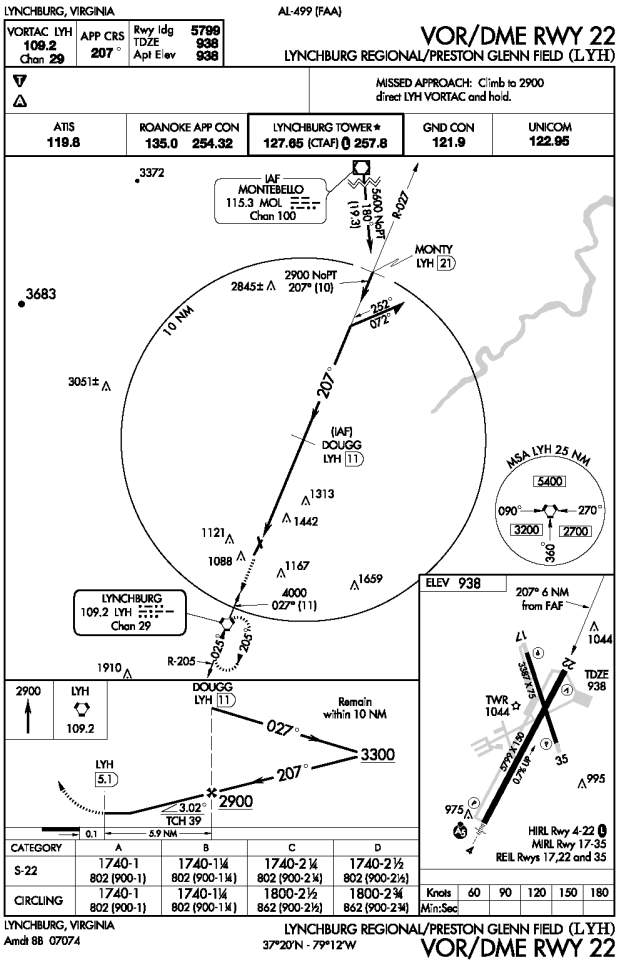
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	1 SM **REQUIRED**	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Lynchburg Regional/Preston Glenn Field (LYH)

Lynchburg, Virginia

Procedure Overview



VOR/DME RWY 22

FAA PROCEDURE DATA		
Critical Obstacle:	1442	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:	48	**see note 2**
Rounding Adjustment:	0	
Minimum Descent Altitude / Decision Height:	1740	

Note 1: TWR (KLYH0082)

Note 2: OE

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

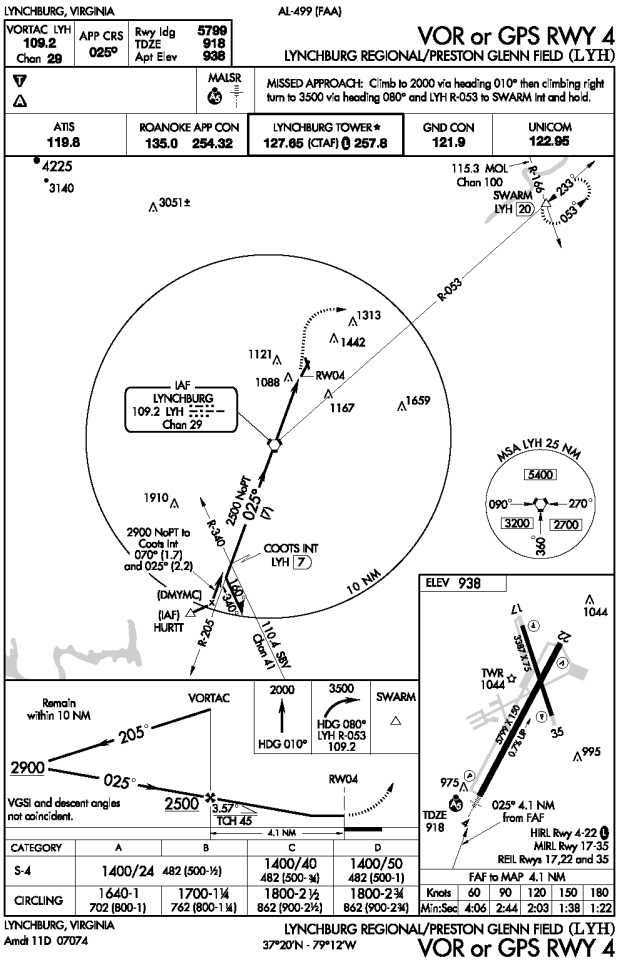
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Lynchburg Regional/Preston Glenn Field (LYH)

Lynchburg, Virginia

Procedure Overview



VOR OR GPS RWY 4

FAA PROCEDURE DATA		
Critical Obstacle:	1144	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	6	
Minimum Descent Altitude / Decision Height:	1400	

Note 1: TWR (KLYH079)

Note 2:

Note 3:

NE-3, 05 JUL 2007 to 02 AUG 2007

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	<3/4 SM	**KNOWN DEFICIENCIES**
	REQUIRED	
TERPS Paragraph 251	34:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	4,200 ft (Paved)	None
Runway Markings	Precision	None
Holding Position Signs and Markings	Precision	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	MALSR, SSALR, or ALSF Required	None
Runway Design Standards	<3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 9, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Procedure Recommendations

ILS OR LOC RWY 4		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Distance Measuring Equipment Install Distance Measuring Equipment (DME). Co-locate with the localizer.	Improves pilot's situational awareness and simplifies procedure.	$200,000

GPS RWY 22		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Procedure Review Request procedure title be updated to RNAV (GPS) RWY 22 format.	Procedure clarity.	No equipment cost
Visibility Minimum Upon installation of approach lighting system, request procedure be updated to 3/4 statute mile visibility.	Lower landing visibility minimum.	See Overall Recommendations

VOR / DME RWY 22		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Visibility Minimum Upon installation of approach lighting system, request procedure be updated to 3/4 statute mile visibility.	Lower landing visibility minimum.	See Overall Recommendations

Procedure Recommendations

VOR OR GPS RWY 4		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a

Manassas Regional/Harry P. Davis Field (HEF)

Manassas, Virginia

AIRPORT INFORMATION

ROLE / CLASSIFICATION INFORMATION

VATSP Classfication (2008):	Reliever
NPIAS Role (2008):	Reliever
Study Classification:	Reliever

ACTIVITY INFORMATION

Based Aircraft (2007):	431
Annual Operations (2020):	168298
Annual Enplanements (2020):	n/a

DEVELOPMENT INFORMATION (2008)

Critical Airport Reference Code (Existing):	C-III
Critical Airport Reference Code (Proposed):	C-III
Airport Layout Plan (Original):	October, 2002
Airport Layout Plan (Revision):	n/a

Proposed Development (from ALD):

- Extend RWY 34R (500')
- Upgrade RWY 34R RPZ
- Install ODALS (RWY 34R)

AERONAUTICAL SURVEY INFORMATION

Runway End	Survey Type	Survey Date
all	Photoslope	2006
all	OC-HEF 5326	1991
34R	ANAPC	2003
16L	ANAPC	2003

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS

Available Weather Reporting:	AWOS-III
Common Traffic Advisory Frequency:	133.1
Clearance Delivery:	Direct

Nearby Navigational Aids:

WASHINGTON	VOR/DME	111	DCA	259°/ 23.9 NM TO FIELD
CASANOVA	VORTAC	116.3	CSN	080°/17.1 NM TO FIELD
BROOKE	VORTAC	114.5	BRV	351°/ 24.3 NM TO FIELD
ARMEL	VORTAC	113.5	AML	198°/ 13.0 NM TO FIELD

Manassas Regional/Harry P. Davis Field (HEF)

Manassas, Virginia

Instrument Approach Procedure Summary

Minimums listed are Category B

EXISTING PROCEDURES		
RUNWAY 16L		
ILS RWY 16L - ILS	442 - 3/4 (250)	Amdt 4B
ILS RWY 16L - LOC	780 - 3/4 (588)	Amdt 4B
RNAV (GPS) RWY 16L - LNAV	640 - 1/2 (448)	Orig A
RNAV (GPS) RWY 16L - LPV	490 - 1/2 (298)	Orig A
RNAV (GPS) RWY 16L - VNAV	720 - 1 1/4 (528)	Orig A
RUNWAY 16R		
RNAV (GPS) RWY 16R - LNAV	640 - 1 (455)	Orig
RUNWAY 34R		
RNAV (GPS) RWY 34R - LNAV	620 - 1 (443)	Orig

PROCEDURES PROPOSED AS PART OF STUDY
LOC RWY 34R
RNAV (GPS) RWY 34L - LNAV
RNAV (GPS) RWY 34R - LPV
RNAV (RNP) RWY 16L
RNAV (RNP) RWY 34R

VISIBILITY CHANGES PROPOSED AS PART OF STUDY	
RUNWAY 34R:	1 SM to 3/4 SM

REVIEWER COMMENTS

An alternate ground-based approach is recommended. The Study recommends development of LPV, RNP and LOC procedures to Runway 34R. The Study recommends a reduction in landing visibility minimums. Additional information regarding the estimated impacts and costs associated with the visibility changes is included in Appendix E. The Airport Sponsor completed the requested informational survey.

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 16L 34R INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	C-III	C-III
Runway Dimensions (Length x Width in ft):	5700 x 100	6200 x 100
Runway to Taxiway Separation (feet):	400	400
Runway Lighting:	HIRL	HIRL
RUNWAY 16L		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	1000 x 1750 x 2500	1000 x 1750 x 2500
Runway Markings:	Precision	Precision
Available Visual Approach Aids:	PAPI, MALSR	PAPI, MALSR
RUNWAY 34R		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 1010 x 1700	1000 x 1510 x 1700
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	PAPI, REILs	PAPI, ODALS
RUNWAY 16R 34L INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	B-II	B-II
Runway Dimensions (Length x Width in ft):	3703 x 100	3703 x 100
Runway to Taxiway Separation (feet):	250	250
Runway Lighting:	MIRL	MIRL
RUNWAY 16R		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 700 x 1000	500 x 700 x 1000
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	PAPI, REILs	PAPI, REILs
RUNWAY 34L		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 700 x 1000	500 x 700 x 1000
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	PAPI, REILs	PAPI, REILs

Manassas Regional/Harry P. Davis Field (HEF)

Manassas, Virginia

System Benchmarks

Reliever			
Best Approach (Primary Runway End)			
BENCHMARK		**RUNWAY 16L**	
Approach:	ILS CAT I	☑ meets	ILS RWY 16L - ILS
Ceiling:	200 AGL	☐ meets	
Visibility:	1/2 statute mile	☐ meets	
Approach:	LPV	☑ meets	RNAV (GPS) RWY 16L - LPV
Ceiling:	200 AGL	☐ meets	
Visibility:	1/2 statute mile	☑ meets	
Equipment:	MALSR, HIRLs, PAPI	☑ meets	
Secondary Approach (Different Runway End)			
BENCHMARK		**RUNWAY 34R**	
Approach:	Ground-based	☐ meets	n/a (no ground-based approach available)
Ceiling:	400 AGL	☐ meets	
Visibility:	3/4 staute mile	☐ meets	
Approach:	LPV	☐ meets	RNAV (GPS) RWY 34R - LNAV
Ceiling:	250 AGL	☐ meets	
Visibility:	3/4 statute mile	☐ meets	
Equipment:	MALS, HIRLs, PAPI	☐ meets	existing HIRLs, PAPI
All Ends of Instrument Runways			
BENCHMARK		**RUNWAY 34L**	
Approach:	none	☐ meets	n/a (no ground-based approach available)
Ceiling:		☐ meets	
Visibility:		☐ meets	
Approach:	LNAV	☐ meets	n/a (no satellite-based approach available)
Ceiling:	400 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Equipment:	REILs, MIRLs, PAPI	☑ meets	

Manassas Regional/Harry P. Davis Field (HEF)

Manassas, Virginia

BENCHMARK		RUNWAY 16R	
Approach:	none	☐ meets	n/a (no ground-based approach available)
Ceiling:		☐ meets	
Visibility:		☐ meets	
Approach:	LNAV	☑ meets	RNAV (GPS) RWY 16R - LNAV
Ceiling:	400 AGL	☐ meets	
Visibility:	1 statute mile	☑ meets	
Equipment:	REILs, MIRLs, PAPI	☑ meets	

Weather:	on-field, 24/7, data-linked	☑ meets	
Access to ATC Clearance:	RTR	☑ meets	
ADS-B Coverage:	On ground	☐ meets	

Overall Recommendations

GENERAL		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Weather Reporting Upgrade existing AWOS-III to include present weather, lightning and freezing rain sensor.	Improves information available to pilot.	$60,000
Communications Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	Improve pilot/controller communications and clearance delivery process when the ATCT is closed.	Less than $5,000
Data link Provide ADS-B coverage while on the ground.	Provides traffic surveillance, terrain avoidance, weather data, etc. Crucial component for Next Generation Air Transportation System.	$100,000
Local Area Augmentation System (LAAS) Provide LAAS coverage to augment existing global positioning system.	Provides enhanced signal accuracy.	Unknown

RUNWAY 16L 34R		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Airfield Lighting Control Change control sequence and/or facility directory note for HIRLs to be preset on low intensity with higher intensity activated on CTAF.	Provides visibilty of landing environment during night and adverse weather conditions even during times of aircraft equipment failure or pilot control system malfunction.	Less than $10,000

Overall Recommendations

RUNWAY 16L		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstruction (tree).	Standards.	Varies
Weather Reporting Install Runway Visual Range (RVR) equipment.	Replaces prevailing visibility measurement.	$400,000
New Procedure Request development of RNAV (RNP) RWY 16L Approach.	Improve all-weather capability of the runway and airport. Simplifies procedure.	No equipment cost

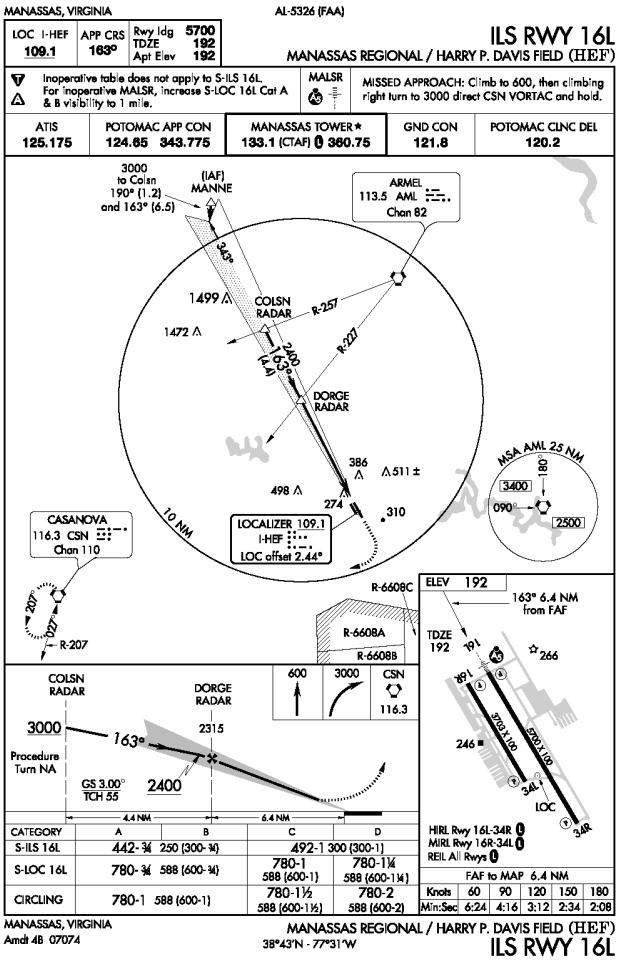
Overall Recommendations

RUNWAY 34R		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstruction (tree).	Standards.	Varies
Approach Lighting System Install MALS for Runway 34R.	Improves pilot's ability to detect the landing environment.	$450,000
Visibility Minimum Upon installation of approach lighting system and subsequent acceptance of visibility credit, different design standards apply (less than 1 mile).	Lower landing visibility minimum.	$400,000
Aeronautical Survey Request / update aeronautical survey to enable development of LPV, RNP and LOC approaches to Runway 34R.	Provides survey data for instrument approach procedures.	$60,000
New Procedure Install localizer and request development of LOC RWY 34R Approach. An offset localizer may be required to avoid R-6608 airspace.	Improve all-weather capability of the runway and airport. Provides a ground-based procedure to Runway 34R.	$400,000
New Procedure Request development of RNAV (GPS) RWY 34R Approach with LPV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost
New Procedure Request development of RNAV (RNP) RWY 34R Approach.	Improve all-weather capability of the runway and airport. Simplifies procedure.	No equipment cost

Overall Recommendations

RUNWAY 34L		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstruction (tree).	Standards.	Varies
Aeronautical Survey Request / complete aeronautical survey to enable development of LNAV approach to Runway 34L.	Provides survey data for instrument approach procedures.	$60,000 (duplicate)
New Procedure Request development of RNAV (GPS) RWY 34L Approach with LNAV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost

Procedure Overview



ILS RWY 16L - ILS

FAA PROCEDURE DATA	
Critical Obstacle:	**see note 1**
Required Obstacle Clearance:	
Remote Altimeter Adjustment:	
Accuracy Code Adjustment:	
Other Adjustment:	**see note 2**
Rounding Adjustment:	
Minimum Descent Altitude / Decision Height:	442

Note 1: ASC

Note 2:

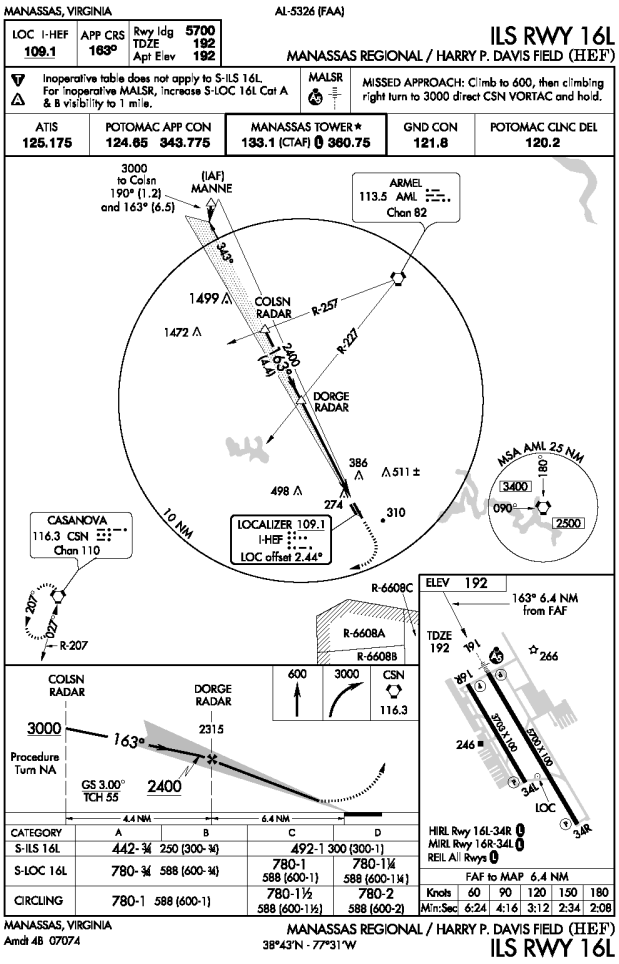
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1A - PRECISION INSTRUMENT APPROACH REQUIREMENTS

	<1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	4,200 ft (Paved)	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	Recommended	None
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 8, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Procedure Overview



NE-3, 05 JUL 2007 to 02 AUG 2007

NE-3, 05 JUL 2007 to 02 AUG 2007

ILS RWY 16L - LOC

FAA PROCEDURE DATA		
Critical Obstacle:	509	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:	19	**see note 2**
Rounding Adjustment:	2	
Minimum Descent Altitude / Decision Height:	780	

Note 1: 100' Trees

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

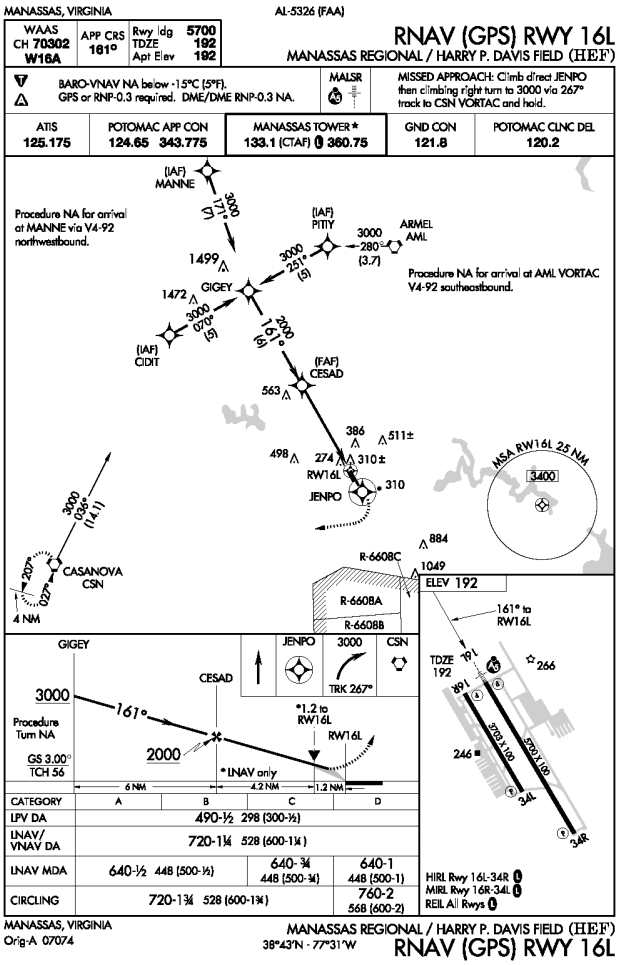
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	<1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft (Paved)	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	Required	None
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 8, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Manassas Regional/Harry P. Davis Field (HEF)

Manassas, Virginia

Procedure Overview



RNAV (GPS) RWY 16L - LPV

FAA PROCEDURE DATA	
Critical Obstacle:	256 **see note 1**
Required Obstacle Clearance:	
Remote Altimeter Adjustment:	
Accuracy Code Adjustment:	
Other Adjustment:	**see note 2**
Rounding Adjustment:	
Minimum Descent Altitude / Decision Height:	490

Note 1: Tree

Note 2:

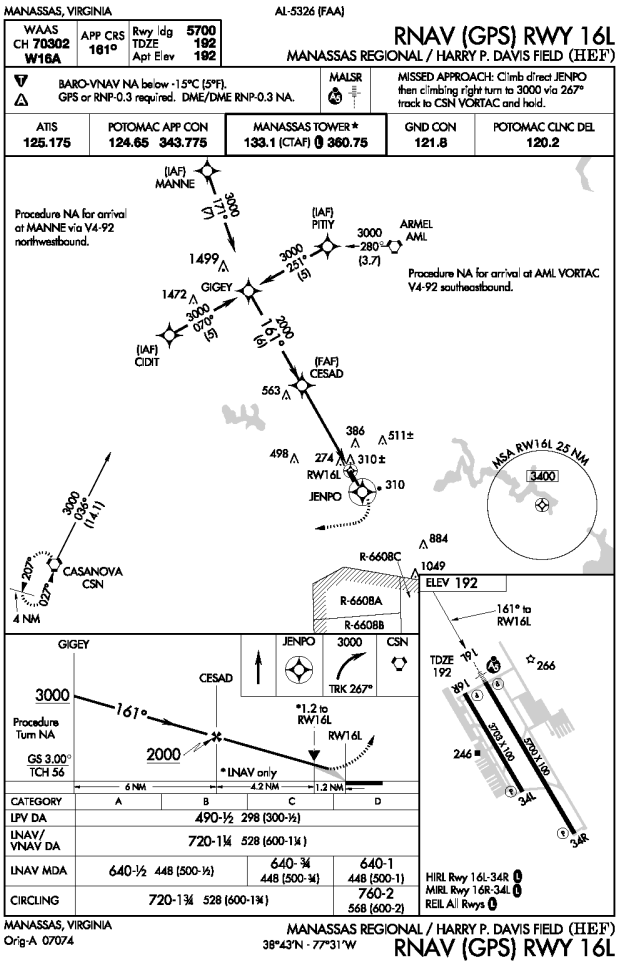
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1B - APPROACH PROCEDURE WITH VERTICAL GUIDANCE APPROACH REQUIREMENTS		
	<3/4 SM	**KNOWN DEFICIENCIES**
	REQUIRED	
TERPS Paragraph 251	34:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	4,200 ft (Paved)	None
Runway Markings	Precision	None
Holding Position Signs and Markings	Precision	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	Required	None
Runway Design Standards	<3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 4 and 9, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Manassas Regional/Harry P. Davis Field (HEF)

Manassas, Virginia

Procedure Overview



RNAV (GPS) RWY 16L - VNAV

FAA PROCEDURE DATA		
Critical Obstacle:	310	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:	145	**see note 2**
Rounding Adjustment:	15	
Minimum Descent Altitude / Decision Height:	720	

Note 1: Trees

Note 2: missed approach segment

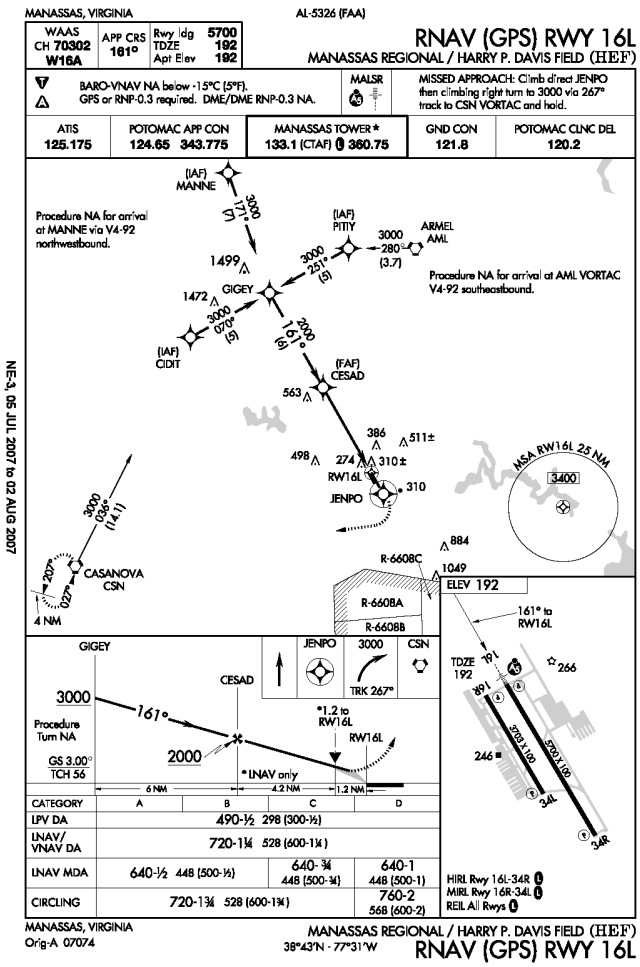
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1B - APPROACH PROCEDURE WITH VERTICAL GUIDANCE APPROACH REQUIREMENTS

	>1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	None
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 4 and 8, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Procedure Overview



RNAV (GPS) RWY 16L - LNAV

FAA PROCEDURE DATA		
Critical Obstacle:	496	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:	-113	**see note 2**
Rounding Adjustment:	7	
Minimum Descent Altitude / Decision Height:	640	

Note 1: Tank

Note 2: secondary area adjustment

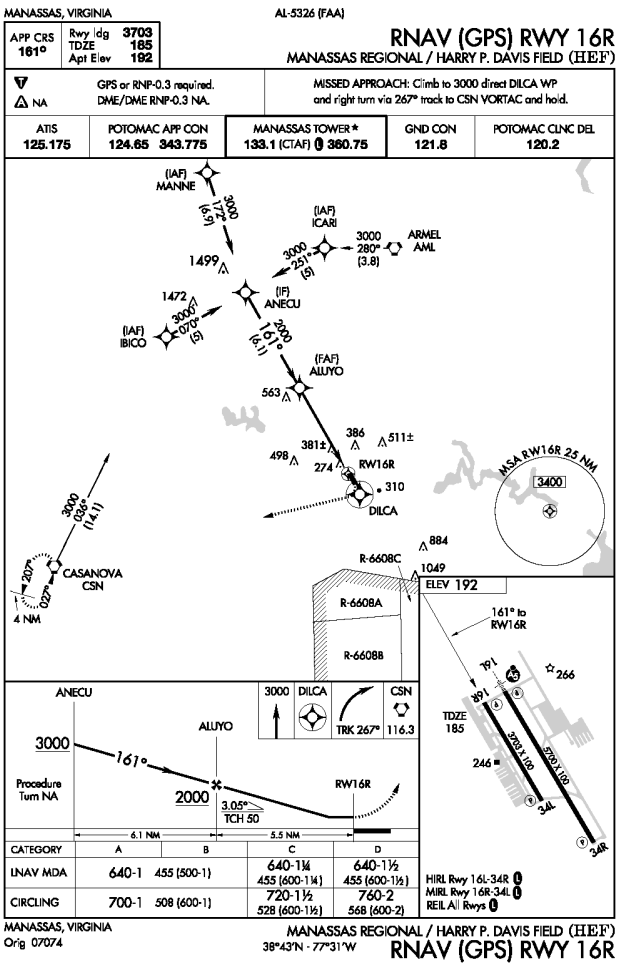
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	<3/4 SM	**KNOWN DEFICIENCIES**
	REQUIRED	
TERPS Paragraph 251	34:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	4,200 ft (Paved)	None
Runway Markings	Precision	None
Holding Position Signs and Markings	Precision	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	MALSR, SSALR, or ALSF Required	None
Runway Design Standards	<3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 9, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Manassas Regional/Harry P. Davis Field (HEF)

Manassas, Virginia

Procedure Overview



RNAV (GPS) RWY 16R - LNAV

FAA PROCEDURE DATA		
Critical Obstacle:	381	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	9	
Minimum Descent Altitude / Decision Height:	640	

Note 1: Tree

Note 2:

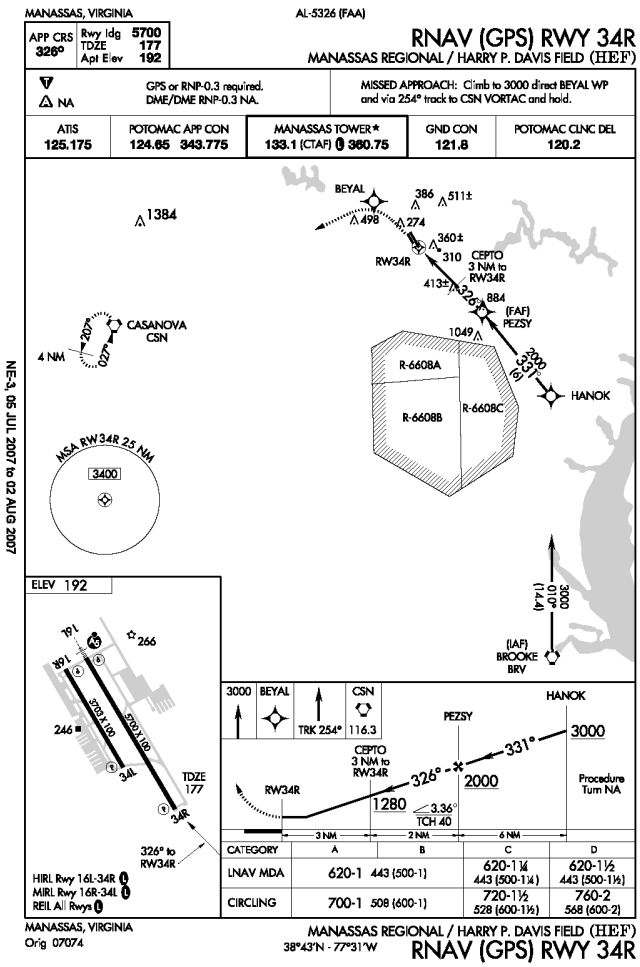
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	1 SM	**KNOWN DEFICIENCIES**
	REQUIRED	
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Manassas Regional/Harry P. Davis Field (HEF)

Manassas, Virginia

Procedure Overview



RNAV (GPS) RWY 34R - LNAV

FAA PROCEDURE DATA		
Critical Obstacle:	360	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	10	
Minimum Descent Altitude / Decision Height:	620	

Note 1: Tree

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	1 SM	**KNOWN DEFICIENCIES**
	REQUIRED	
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Recommendations

ILS RWY 16L		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Localizer Relocate localizer to centerline to allow for publication of standard ILS minimums.	Standards. May permit lower DA and visibility minimums (200-1/2).	$100,000
Step-Down Fix Request localizer procedure be modified to include step-down fix.	Minimum Descent Altitude (MDA) may be reduced for the localizer approach.	No equipment cost
Marker Beacon Install an Outer Marker.	Simplifies procedure.	$50,000
Distance Measuring Equipment Install Distance Measuring Equipment (DME). Co-locate with the localizer.	Improves pilot's situational awareness. Preferred method to establish the final approach and localizer step-down fix.	$200,000
Weather Reporting Install Runway Visual Range (RVR) equipment. See Overall Recommendations.	Reduces visibility minimum to as low as 2400 feet RVR.	$400,000 (duplicate)

RNAV (GPS) RWY 16L		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Weather Reporting Install Runway Visual Range (RVR) equipment. See Overall Recommendations.	Reduces visibility minimum to as low as 2400 feet RVR.	$400,000 (duplicate)

Procedure Recommendations

RNAV (GPS) RWY 16R		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a

RNAV (GPS) RWY 34R		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Approach Lighting System Install MALS for Runway 34R. See Overall Recommendations.	Improves pilot's ability to detect the landing environment.	$450,000 (duplicate)
Visibility Minimum Upon installation of approach lighting system, request procedure be updated to 3/4 statute mile visibility.	Lower landing visibility minimum.	No equipment cost

Marks Municipal (W63)

Clarksville, Virginia

AIRPORT INFORMATION	
ROLE / CLASSIFICATION INFORMATION	
VATSP Classfication (2008):	General Aviation Community
NPIAS Role (2008):	n/a
Study Classification:	General Aviation Community

ACTIVITY INFORMATION	
Based Aircraft (2007):	4
Annual Operations (2020):	1668
Annual Enplanements (2020):	n/a

DEVELOPMENT INFORMATION (2008)	
Critical Airport Reference Code (Existing):	B-II
Critical Airport Reference Code (Proposed):	B-II
Airport Layout Plan (Original):	December, 1994
Airport Layout Plan (Revision):	n/a

Proposed Development (from ALD):

- Construct partial parallel taxiway

AERONAUTICAL SURVEY INFORMATION

Runway End	Survey Type	Survey Date
all	Photoslope	2006
4	ANA-LPV	2007

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS	
Available Weather Reporting:	None
Common Traffic Advisory Frequency:	122.9
Clearance Delivery:	Phone

Nearby Navigational Aids:

SOUTH BOSTON	VORTAC	110.4	SBV	107°/ 22.4 NM TO FIELD

Marks Municipal (W63)

Clarksville, Virginia

Instrument Approach Procedure Summary

Minimums listed are Category B

EXISTING PROCEDURES		
CIRCLING		
VOR/DME-A	1040 - 1 (619)	Orig
RUNWAY 4		
GPS RWY 4	820 - 1 (417)	Orig

PROCEDURES PROPOSED AS PART OF STUDY
RNAV (GPS) RWY 22 - LNAV
RNAV (GPS) RWY 4 - LPV or LP

VISIBILITY CHANGES PROPOSED AS PART OF STUDY	
none	

REVIEWER COMMENTS

A new approach to Runway 22 would eliminate the requirement for circle-to-land operations when the wind and weather conditions favor landing to the southwest. The Airport Sponsor completed the requested informational survey.

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 4 22 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	B-II	B-II
Runway Dimensions (Length x Width in ft):	4500 x 50	4500 x 75
Runway to Taxiway Separation (feet):	none	240
Runway Lighting:	MIRL	MIRL
RUNWAY 4		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	250 x 450 x 1000	250 x 450 x 1000
Runway Markings:	Visual	Non-Precision
Available Visual Approach Aids:	APAP	PAPI; REILs
RUNWAY 22		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	250 x 450 x 1000	250 x 450 x 1000
Runway Markings:	Visual	Non-Precision
Available Visual Approach Aids:	none	PAPI

Marks Municipal (W63)

Clarksville, Virginia

System Benchmarks

General Aviation Community			
Best Approach (Primary Runway End)			
BENCHMARK		**RUNWAY 4**	
Approach:	Ground-based	☐ meets	n/a (no ground-based approach available)
Ceiling:	500 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Approach:	LNAV	☐ meets	GPS RWY 4
Ceiling:	400 AGL	☐ meets	
Visibility:	1 statute mile	☑ meets	
Equipment:	REILs, MIRLs, PAPI	☐ meets	existing MIRLs
Secondary Approach (Different Runway End)			
BENCHMARK		**RUNWAY 22**	
Approach:		☐ meets	n/a (no ground-based approach available)
Ceiling:		☐ meets	
Visibility:		☐ meets	
Approach:	LNAV	☐ meets	n/a (no satellite-based approach available)
Ceiling:	500 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Equipment:	REILs, MIRLs, PAPI	☐ meets	existing MIRLs

Additional Requirements			
Weather:	Normally on-field, 24/7, data-linked	☐ meets	
Access to ATC Clearance:	RTR or GCO	☐ meets	
ADS-B Coverage:	1000 AGL	☐ meets	

Overall Recommendations

GENERAL		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Altimeter Source Install AWOS-A.	Provides local altimeter source.	$25,000
Communications Install a Ground Communication Outlet (GCO) directly with Washington Center.	Provides direct communication with approach control via radio and an "on-demand" telephone land line link. Used by aircraft on ground for obtaining or canceling IFR clearances.	$20,000
Communications Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	Improves pilot/controller communications and clearance delivery process.	Less than $5,000
Data link Provide ADS-B coverage at 1000 AGL or lower.	Provides traffic surveillance, terrain avoidance, weather data, etc. Crucial component for Next Generation Air Transportation System.	Unknown

RUNWAY 4		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions (trees).	Standards. Required for authorization for night approaches.	Varies
Runway End Identifier Lights Install REILs for Runway 4.	Improves pilot's ability to detect the landing environment.	$50,000
Precision Approach Path Indicator Install 4-box PAPI for Runway 4.	Provides visual vertical descent guidance information during the approach to the runway.	$70,000
New Procedure Request development of RNAV (GPS) RWY 4 Approach with LP or LPV landing minimums.	Improve all-weather capability of the runway and airport and provide vertical guidance.	No equipment cost

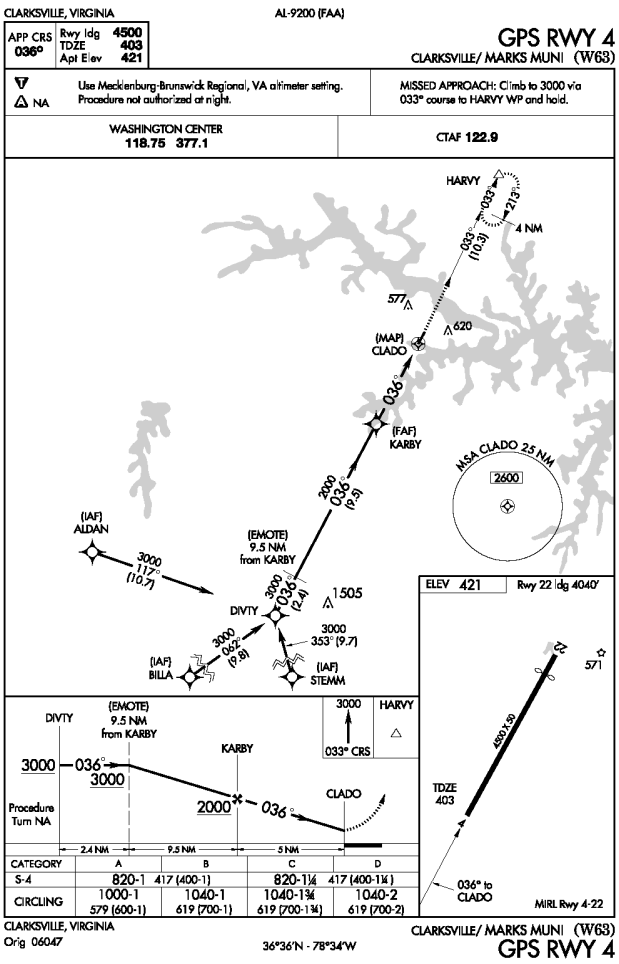
Overall Recommendations

RUNWAY 22		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions (trees).	Standards.	Varies
Runway End Identifier Lights Install REILs for Runway 22.	Improves pilot's ability to detect the landing environment.	$50,000
Precision Approach Path Indicator Install 4-box PAPI for Runway 22.	Provides visual vertical descent guidance information during the approach to the runway.	$70,000
Aeronautical Survey Request / complete aeronautical survey to enable development of LNAV approach to Runway 22.	Provides survey data for instrument approach procedures.	Completed 2006
New Procedure Request development of RNAV (GPS) RWY 22 Approach with LNAV landing minimums.	Improve all-weather capability of the runway and airport and eliminate requirement for circle-to-land operations.	No equipment cost

Marks Municipal (W63)

Clarksville, Virginia

Procedure Overview



GPS RWY 4

FAA PROCEDURE DATA		
Critical Obstacle:	509	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:	61	
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	0	
Minimum Descent Altitude / Decision Height:	820	

Note 1: Trees (60')

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

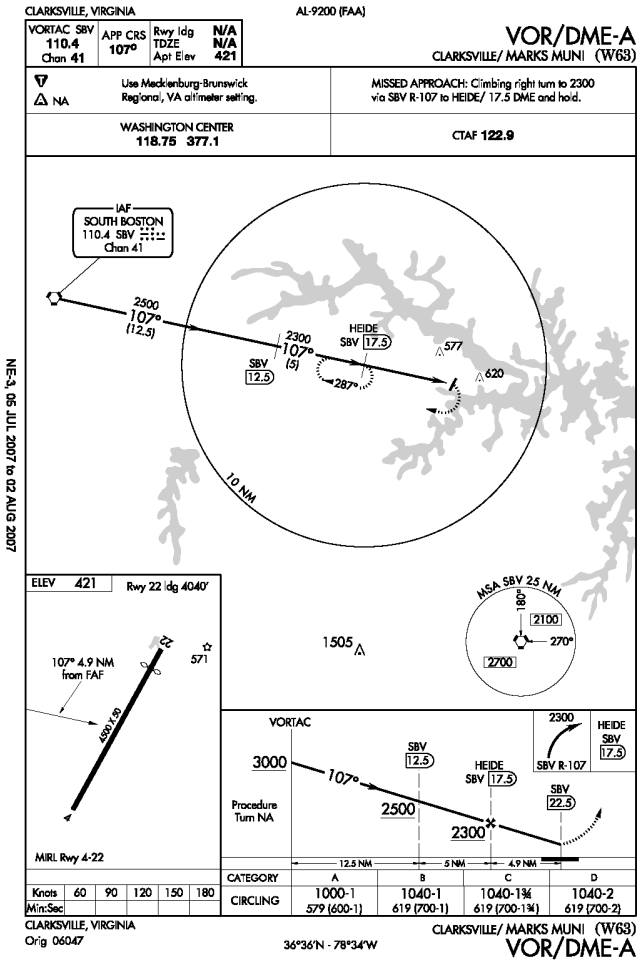
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	Yes
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	Yes
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Marks Municipal (W63)

Clarksville, Virginia

Procedure Overview



VOR/DME-A

FAA PROCEDURE DATA		
Critical Obstacle:	620	**see note 1**
Required Obstacle Clearance:	300	
Remote Altimeter Adjustment:	61	
Accuracy Code Adjustment:	50	
Other Adjustment:		**see note 2**
Rounding Adjustment:	9	
Minimum Descent Altitude / Decision Height:	1040	

Note 1: Tower (47-1143)

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	CIRCLING	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Recommended	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Visual (Basic)	None
Holding Position Signs and Markings	Visual (Basic)	None
Runway Edge Lights	MIRL / LIRL (for night minima only)	None
Parallel Taxiway	Recommended	Yes
Approach Lights	Not Required	None
Runway Design Standards	Not Required	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-2, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Recommendations

GPS RWY 4		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Altimeter Source Install AWOS-A and request FAA re-evaluation of remote altimeter setting source penalty.	Minimum Descent Altitude (MDA) may be reduced by 60 to 80 feet by eliminating the remote altimeter setting source (RASS) adjustment.	$25,000 (duplicate)
Procedure Review Request procedure title be updated to RNAV (GPS) RWY 4 format.	Procedure clarity.	No equipment cost

VOR / DME A		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Critical Obstacle Field verify critical obstacle to change accuracy code from "D" to "A" or 50 feet to 3 feet.	Minimum Descent Altitude (MDA) may be reduced by 40 to 60 feet.	Less than $10,000
Altimeter Source Install AWOS-A and request FAA re-evaluation of remote altimeter setting source penalty. See Overall Recommendations.	Minimum Descent Altitude (MDA) may be reduced by 60 to 80 feet by eliminating the remote altimeter setting source (RASS) adjustment.	$25,000 (duplicate)

Mecklenburg-Brunswick Regional (AVC)

South Hill, Virginia

AIRPORT INFORMATION	
ROLE / CLASSIFICATION INFORMATION	
VATSP Classfication (2008):	General Aviation Regional
NPIAS Role (2008):	General Aviation
Study Classification:	General Aviation Regional (1 mile visibility)

ACTIVITY INFORMATION	
Based Aircraft (2007):	19
Annual Operations (2020):	13076
Annual Enplanements (2020):	n/a

DEVELOPMENT INFORMATION (2008)	
Critical Airport Reference Code (Existing):	B-II
Critical Airport Reference Code (Proposed):	B-II
Airport Layout Plan (Original):	January, 1993
Airport Layout Plan (Revision):	February, 2001

Proposed Development (from ALD):

- Complete parallel taxiway
- Upgrade RWY 1 RPZ
- Upgrade RWY 19 RPZ
- Increase runway strength to 25,000#

AERONAUTICAL SURVEY INFORMATION

Runway End	Survey Type	Survey Date
all	Photoslope	2000

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS	
Available Weather Reporting:	AWOS-III (PT)
Common Traffic Advisory Frequency:	122.8
Clearance Delivery:	GCO

Nearby Navigational Aids:

LAWRENCEVILLE	VORTAC	112.9	LVL	231°/ 10.7 NM TO FIELD
JONES	NDB	373	AEA	008°/ 4.4 NM TO FIELD

Mecklenburg-Brunswick Regional (AVC)

South Hill, Virginia

Instrument Approach Procedure Summary

Minimums listed are Category B

EXISTING PROCEDURES		
RUNWAY 1		
LOC RWY 1	800 - 1 (383)	Orig
RUNWAY 19		
GPS RWY 19	760 - 1 (318)	Orig

PROCEDURES PROPOSED AS PART OF STUDY
RNAV (GPS) RWY 1 - LNAV
RNAV (GPS) RWY 1 - LPV

VISIBILITY CHANGES PROPOSED AS PART OF STUDY	
none	

REVIEWER COMMENTS

The airport does not currently have any vertically-guided approaches. Additionally, the localizer equipment is problematic and in need of replacement. The GCO is not currently listed in the Facility Directory or on the approach plates. The Airport Sponsor completed the requested informational survey.

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 1 19 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	B-II	B-II
Runway Dimensions (Length x Width in ft):	5002 x 75	5002 x 75
Runway to Taxiway Separation (feet):	400	400
Runway Lighting:	MIRL	MIRL
RUNWAY 1		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 700 x 1000	1000 x 1510 x 1700
Runway Markings:	Non-Precision	Non-Precisoin
Available Visual Approach Aids:	PAPI; REILs	PAPI; REILs
RUNWAY 19		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 700 x 1000	1000 x 1510 x 1700
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	PAPI; REILs	PAPI; REILs

Mecklenburg-Brunswick Regional (AVC)

South Hill, Virginia

System Benchmarks

General Aviation Regional (1 mile visibility)			
Best Approach (Primary Runway End)			
BENCHMARK		**RUNWAY 1**	
Approach:	Ground-based	☑ meets	LOC RWY 1
Ceiling:	400 AGL	☑ meets	
Visibility:	1 statute mile	☑ meets	
Approach:	LPV	☐ meets	n/a (no satellite-based approach available)
Ceiling:	250 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Equipment:	REILs (or approach lights), MIRLs, PAPI	☑ meets	
Secondary Approach (Different Runway End)			
BENCHMARK		**RUNWAY 19**	
Approach:		☐ meets	n/a (no ground-based approach available)
Ceiling:		☐ meets	
Visibility:		☐ meets	
Approach:	LNAV	☐ meets	GPS RWY 19
Ceiling:	400 AGL	☑ meets	
Visibility:	1 statute mile	☑ meets	
Equipment:	REILs, MIRLs, PAPI	☑ meets	

Additional Requirements			
Weather:	on-field, 24/7, data-linked	☑ meets	
Access to ATC Clearance:	RTR or GCO	☑ meets	
ADS-B Coverage:	On ground	☐ meets	

Overall Recommendations

GENERAL		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Weather Reporting Upgrade existing AWOS-III to include freezing rain sensor.	Improves information available to pilot.	$50,000
Communications Request publication of GCO frequency in the Airport Facility Directory and on instrument approach plates.	Clarity.	No equipment cost
Communications Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	Improves pilot/controller communications and clearance delivery process.	Less than $5,000
Data link Provide ADS-B coverage while on the ground.	Provides traffic surveillance, terrain avoidance, weather data, etc. Crucial component for Next Generation Air Transportation System.	$100,000

Overall Recommendations

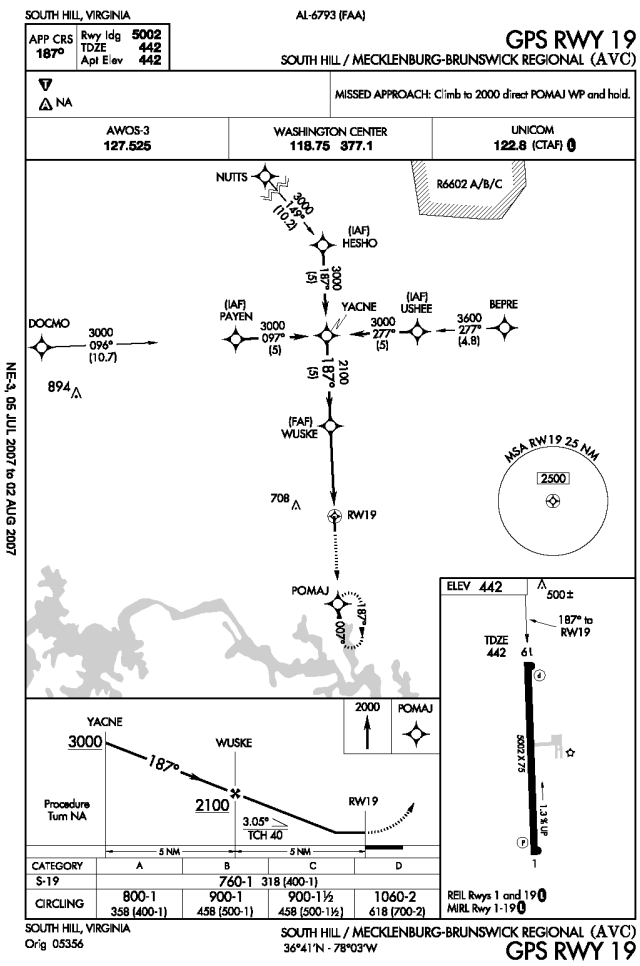
RUNWAY 1		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions (trees).	Standards.	Varies
Approach Lighting System Install MALS for Runway 1.	Improves pilot's ability to detect the landing environment (no change to landing visibility minimum).	$400,000
Precision Approach Path Indicator Upgrade Runway 1 PAPI from a 2 box to a 4 box unit.	Provides improved visual vertical descent guidance information during the approach to the runway.	$20,000
Aeronautical Survey Request / complete aeronautical survey to enable development of LNAV and LPV approaches to Runway 1.	Provides survey data for instrument approach procedures.	$50,000
New Procedure Request development of RNAV (GPS) RWY 1 Approach with LPV and LNAV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost

RUNWAY 19		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions (trees).	Standards.	Varies
Precision Approach Path Indicator Upgrade Runway 19 PAPI from a 2 box to a 4 box unit.	Provides improved visual vertical descent guidance information during the approach to the runway.	$20,000

Mecklenburg-Brunswick Regional (AVC)

South Hill, Virginia

Procedure Overview



GPS RWY 19

FAA PROCEDURE DATA		
Critical Obstacle:	500	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	10	
Minimum Descent Altitude / Decision Height:	760	

Note 1: 60' Tree

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

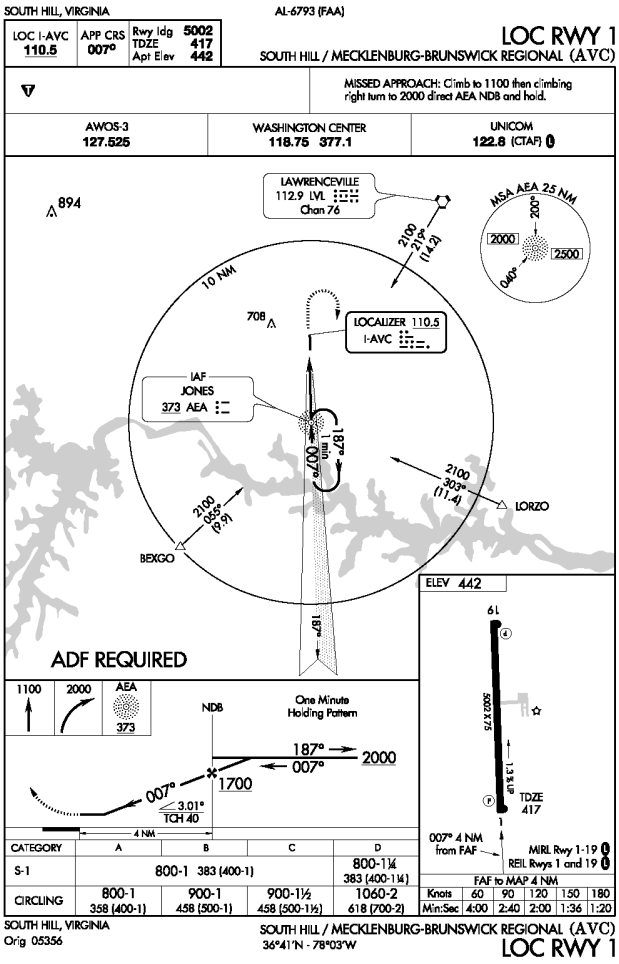
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Mecklenburg-Brunswick Regional (AVC)

South Hill, Virginia

Procedure Overview



LOC RWY 1

FAA PROCEDURE DATA		
Critical Obstacle:	500	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:	50	
Other Adjustment:		**see note 2**
Rounding Adjustment:	0	
Minimum Descent Altitude / Decision Height:	800	

Note 1: 60' Tree

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	1 SM	**KNOWN DEFICIENCIES**
	REQUIRED	
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Recommendations

GPS RWY 19		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Procedure Review Request procedure title be updated to RNAV (GPS) RWY 19 format.	Procedure clarity.	No equipment cost

LOC RWY 1		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Distance Measuring Equipment Install Distance Measuring Equipment (DME). Co-locate with the localizer.	Improves pilot's situational awareness. Preferred method to establish the final approach fix.	$100,000
Procedure Review Request procedure be modified to eliminate ADF requirement.	Procedure simplification and improved reliability.	No equipment cost
Facility Replacement Replace problematic localizer.	Improves reliability.	$100,000

Middle Peninsula Regional (FYJ)

West Point, Virginia

AIRPORT INFORMATION	
ROLE / CLASSIFICATION INFORMATION	
VATSP Classfication (2008):	General Aviation Regional
NPIAS Role (2008):	General Aviation
Study Classification:	General Aviation Regional (3/4 mile visibility)

ACTIVITY INFORMATION	
Based Aircraft (2007):	24
Annual Operations (2020):	25077
Annual Enplanements (2020):	n/a

DEVELOPMENT INFORMATION (2008)	
Critical Airport Reference Code (Existing):	B-II
Critical Airport Reference Code (Proposed):	B-II
Airport Layout Plan (Original):	May, 2006
Airport Layout Plan (Revision):	May, 2007

Proposed Development (from ALD):
- Upgrade RWY 10 RPZ: 3/4 sm visibility
- Install LOC (RWY 10)
- Install ODALS (RWY 10)

AERONAUTICAL SURVEY INFORMATION

Runway End	Survey Type	Survey Date
all	Photoslope	2001
10	ANA-LPV	underway

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS

Available Weather Reporting:	AWOS-III (P)
Common Traffic Advisory Frequency:	123.0
Clearance Delivery:	Phone

Nearby Navigational Aids:

RICHMOND	VORTAC	114.1	RIC	097°/ 26.6 NM TO FIELD
HOPEWELL	VORTAC	112	HPW	062°/ 20.4 NM TO FIELD
HARCUM	VORTAC	108.8	HCM	338°/ 5.0 NM TO FIELD

Middle Peninsula Regional (FYJ)

West Point, Virginia

Instrument Approach Procedure Summary

Minimums listed are Category B

EXISTING PROCEDURES		
CIRCLING		
VOR OR GPS-A	580 - 1 (556)	Amdt 3

PROCEDURES PROPOSED AS PART OF STUDY
LOC RWY 10
RNAV (GPS) RWY 10 - LNAV
RNAV (GPS) RWY 10 - LPV
RNAV (GPS) RWY 28 - LNAV
RNAV (GPS) RWY 28 - LPV

VISIBILITY CHANGES PROPOSED AS PART OF STUDY	
RUNWAY 10:	1 SM to 3/4 SM

REVIEWER COMMENTS

The Study recommends a reduction in visibility minimums from 1 mile to 3/4 mile. Additional information regarding the estimated impacts and costs associated with the visibility changes is included in Appendix E. The Airport Sponsor completed the requested informational survey.

SPONSOR COMMENTS

Sponsor notes that REILS and 2-box PAPI for Runway 10 have been installed (subsequent to Study inventory). Sponsor notes that VOR-A and RNAV (GPS) RWY 10 have been published (subsequent to Study inventory).

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 10 28 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	B-II	B-II
Runway Dimensions (Length x Width in ft):	3750 x 75	5000 x 75
Runway to Taxiway Separation (feet):	>400	>400
Runway Lighting:	MIRL	MIRL
RUNWAY 10		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 X 700 X 1000	1000 X 1510 X 1700
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	none	PAPI; ODALS
RUNWAY 28		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 X 700 X 1000	500 x 700 x 1000
Runway Markings:	Non-Precision	Non-Precisoin
Available Visual Approach Aids:	none	PAPI; REILs

Middle Peninsula Regional (FYJ)

West Point, Virginia

System Benchmarks

General Aviation Regional (3/4 mile visibility)			
Best Approach (Primary Runway End)			
BENCHMARK		**RUNWAY 10**	
Approach:	Ground-based	☐ meets	n/a (no ground-based approach available)
Ceiling:	400 AGL	☐ meets	
Visibility:	3/4 statute mile	☐ meets	
Approach:	LPV	☐ meets	n/a (no satellite-based approach available)
Ceiling:	250 AGL	☐ meets	
Visibility:	3/4 statute mile	☐ meets	
Equipment:	MALS, HIRLs, PAPI	☐ meets	
Secondary Approach (Different Runway End)			
BENCHMARK		**RUNWAY 28**	
Approach:	Ground-based	☐ meets	n/a (no ground-based approach available)
Ceiling:	400 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Approach:	LPV	☐ meets	n/a (no satellite-based approach available)
Ceiling:	250 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Equipment:	REILs, HIRLs, PAPI	☐ meets	

Additional Requirements			
Weather:	on-field, 24/7, data-linked	☑ meets	
Access to ATC Clearance:	RTR	☐ meets	
ADS-B Coverage:	On ground	☐ meets	

Overall Recommendations

GENERAL		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Weather Reporting Upgrade existing AWOS-III to include lightning and freezing rain sensor.	Improves information available to pilot.	$60,000
Data link Provide ADS-B coverage while on the ground.	Provides traffic surveillance, terrain avoidance, weather data, etc. Crucial component for Next Generation Air Transportation System.	$100,000
Communications Install a Remote Transmitter / Receiver (RTR) directly with Potomac Approach.	Provides direct communication with approach control via radio and an "on-demand" telephone land line link. Used by aircraft on ground for obtaining or canceling IFR clearances.	$40,000
Communications Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	Improves pilot/controller communications and clearance delivery process.	Less than $5,000
Local Area Augmentation System (LAAS) Provide LAAS coverage to augment existing global positioning system.	Provides enhanced signal accuracy.	Unknown

RUNWAY 10 28		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Airfield Lighting Control Change control sequence and/or facility directory note for MIRLs to be preset on low intensity with higher intensity activated on CTAF.	Provides visibilty of landing environment during night and adverse weather conditions even during times of aircraft equipment failure or pilot control system malfunction.	Less than $10,000
Runway Lighting Replace Medium Intensity Runway Lights (MIRLs) with High Intensity Runway Lights (HIRLs).	Improves pilot's ability to detect the runway environment.	$300,000

Overall Recommendations

RUNWAY 10		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions.	Standards.	Varies
Runway End Identifier Lights Install REILs for Runway 10.	Improves pilot's ability to detect the landing environment.	$50,000
Precision Approach Path Indicator Install 4-box PAPI for Runway 10.	Provides visual vertical descent guidance information during the approach to the runway.	$70,000
Approach Lighting System Install MALS for Runway 10.	Improves pilot's ability to detect the landing environment.	$450,000
Visibility Minimum Upon installation of approach lighting system and subsequent acceptance of visibility credit, different design standards apply (less than 1 mile).	Lower landing visibility minimum to 3/4 mile for proposed LOC RWY 10 and RNAV (GPS) RWY 10 approaches.	$700,000
Distance Measuring Equipment Install Distance Measuring Equipment (DME) in conjunction with localizer.	Improves pilot's situational awareness and can simplify procedures.	$100,000
New Procedure Install localizer and request development of LOC RWY 10 Approach.	Provide straight-in, ground based approach. Minimums may be as low as 480-3/4 (456) or a reduction of 100 feet.	$200,000
Aeronautical Survey Request / complete aeronautical survey to enable development of LNAV and LPV approaches to Runway 10.	Provides survey data for instrument approach procedures.	$50,000

Overall Recommendations

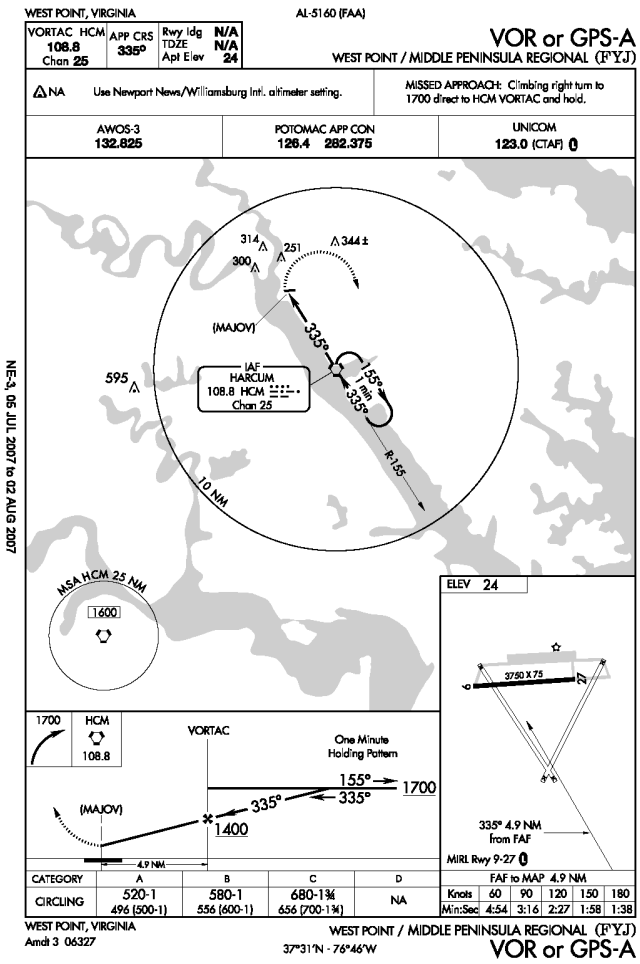
RUNWAY 10		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
New Procedure Request development of RNAV (GPS) RWY 10 Approach with LPV and LNAV landing minimums.	Improve all-weather capability of the runway and airport and eliminate requirement for circle-to-land operations.	No equipment cost

RUNWAY 28		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Runway End Identifier Lights Install REILs for Runway 28.	Improves pilot's ability to detect the landing environment.	$50,000
Precision Approach Path Indicator Install 4-box PAPI for Runway 28.	Provides visual vertical descent guidance information during the approach to the runway.	$70,000
Aeronautical Survey Request / complete aeronautical survey to enable development of LNAV and LPV approaches to Runway 28.	Provides survey data for instrument approach procedures.	$50,000 (duplicate)
New Procedure Request development of RNAV (GPS) RWY 28 Approach with LPV and LNAV landing minimums.	Improve all-weather capability of the runway and airport and eliminate requirement for circle-to-land operations.	No equipment cost

Middle Peninsula Regional (FYJ)

West Point, Virginia

Procedure Overview



VOR OR GPS-A

FAA PROCEDURE DATA		
Critical Obstacle:	202	**see note 1**
Required Obstacle Clearance:	300	
Remote Altimeter Adjustment:	64	
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	14	
Minimum Descent Altitude / Decision Height:	580	

Note 1: Trans Line

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	CIRCLING	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Recommended	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Visual (Basic)	None
Holding Position Signs and Markings	Visual (Basic)	None
Runway Edge Lights	MIRL / LIRL (for night minima only)	None
Parallel Taxiway	Recommended	None
Approach Lights	Not Required	Yes
Runway Design Standards	Not Required	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-2, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Recommendations

VOR OR GPS A		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Obstruction Removal Remove close-in obstructions.	Standards.	Varies
Procedure Review Request procedure be updated to separate GPS approach from ground-based approach.	Procedure clarity.	No equipment cost
Altimeter Source Request FAA re-evaluation of remote altimeter setting source penalty.	Minimum Descent Altitude (MDA) may be reduced by 60 feet by eliminating the remote altimeter setting source (RASS) adjustment.	No equipment cost
Procedure Review (Approach Category) Request addition of Approach Category D minimums to the procedure.	Improves accessibility of the airport.	No equipment cost

Mountain Empire (MKJ)

Marion/Wytheville, Virginia

AIRPORT INFORMATION	
ROLE / CLASSIFICATION INFORMATION	
VATSP Classfication (2008):	General Aviation Regional
NPIAS Role (2008):	General Aviation
Study Classification:	General Aviation Regional (1 mile visibility)

ACTIVITY INFORMATION	
Based Aircraft (2007):	28
Annual Operations (2020):	11159
Annual Enplanements (2020):	n/a

DEVELOPMENT INFORMATION (2008)	
Critical Airport Reference Code (Existing):	B-II
Critical Airport Reference Code (Proposed):	B-II
Airport Layout Plan (Original):	March, 2007
Airport Layout Plan (Revision):	n/a

Proposed Development (from ALD):
- Install ODALS (RWY 26)

AERONAUTICAL SURVEY INFORMATION

Runway End	Survey Type	Survey Date
all	Photoslope	2001
26	ANAPC	2000

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS	
Available Weather Reporting:	AWOS-III
Common Traffic Advisory Frequency:	122.7
Clearance Delivery:	Phone

Nearby Navigational Aids:

SUZZE	NDB	335	MK	259°/ 5.3 NM TO FIELD
BLUEFIELD	VORAC	110	BLF	200°/ 25.8 NM TO FIELD

Mountain Empire (MKJ)

Marion/Wytheville, Virginia

Instrument Approach Procedure Summary

Minimums listed are Category B

EXISTING PROCEDURES		
RUNWAY 26		
LOC RWY 26	3080 - 1 (542)	Amdt 1A
RNAV (GPS) RWY 26 - LNAV	3280 - 1 (761)	Orig
RNAV (GPS) RWY 26 - LPV	3048 - 2 (529)	Orig

PROCEDURES PROPOSED AS PART OF STUDY
LOC/DME RWY 26 (update existing)
RNAV (GPS) RWY 8 - LNAV
RNAV (GPS) RWY 8 - LPV
RNAV (RNP) RWY 26

VISIBILITY CHANGES PROPOSED AS PART OF STUDY	
none	

REVIEWER COMMENTS

A new approach to Runway 8 would eliminate the requirement for circle-to-land operations when the wind and weather conditions favor landing to the northeast.

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 8 26 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	B-II	B-II
Runway Dimensions (Length x Width in ft):	5252 x 75	5252 x 75
Runway to Taxiway Separation (feet):	240	240
Runway Lighting:	MIRL	MIRL
RUNWAY 8		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 700 x 1000	500 x 700 x 1000
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	PAPI; REILs	PAPI; REILs
RUNWAY 26		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 700 x 1000	500 x 700 x 1000
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	PAPI; REILs	PAPI; ODALS

Mountain Empire (MKJ)

Marion/Wytheville, Virginia

System Benchmarks

General Aviation Regional (1 mile visibility)			
Best Approach (Primary Runway End)			
BENCHMARK		**RUNWAY 26**	
Approach:	Ground-based	☑ meets	LOC RWY 26
Ceiling:	400 AGL	☐ meets	
Visibility:	1 statute mile	☑ meets	
Approach:	LPV	☑ meets	RNAV (GPS) RWY 26 - LPV
Ceiling:	250 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Equipment:	REILs (or approach lights), MIRLs, PAPI	☑ meets	
Secondary Approach (Different Runway End)			
BENCHMARK		**RUNWAY 8**	
Approach:		☐ meets	n/a (no ground-based approach available)
Ceiling:		☐ meets	
Visibility:		☐ meets	
Approach:	LNAV	☐ meets	n/a (no satellite-based approach available)
Ceiling:	400 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Equipment:	REILs, MIRLs, PAPI	☑ meets	

Additional Requirements			
Weather:	on-field, 24/7, data-linked	☑ meets	
Access to ATC Clearance:	RTR or GCO	☐ meets	
ADS-B Coverage:	On ground	☐ meets	

Overall Recommendations

GENERAL		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Weather Reporting Upgrade existing AWOS-III to include present weather, lightning and freezing rain sensor.	Improves information available to pilot.	$60,000
Communications Install a Ground Communication Outlet (GCO) directly with Atlanta Center.	Provides direct communication with approach control via radio and an "on-demand" telephone land line link. Used by aircraft on ground for obtaining or canceling IFR clearances.	$20,000
Communications Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	Improves pilot/controller communications and clearance delivery process.	Less than $5,000
Data link Provide ADS-B coverage while on the ground.	Provides traffic surveillance, terrain avoidance, weather data, etc. Crucial component for Next Generation Air Transportation System.	$100,000

RUNWAY 8		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Precision Approach Path Indicator Upgrade Runway 8 PAPI from a 2 box to a 4 box unit.	Provides improved visual vertical descent guidance information during the approach to the runway.	$20,000
Aeronautical Survey Request / complete aeronautical survey to enable development of LNAV and LPV approaches to Runway 8.	Provides survey data for instrument approach procedures.	$50,000
New Procedure Request development of RNAV (GPS) RWY 8 Approach with LPV and LNAV landing minimums.	Improve all-weather capability of the runway and airport and eliminate requirement for circle-to-land operations.	No equipment cost
Obstruction Removal Remove close-in obstructions.	Standards.	Varies

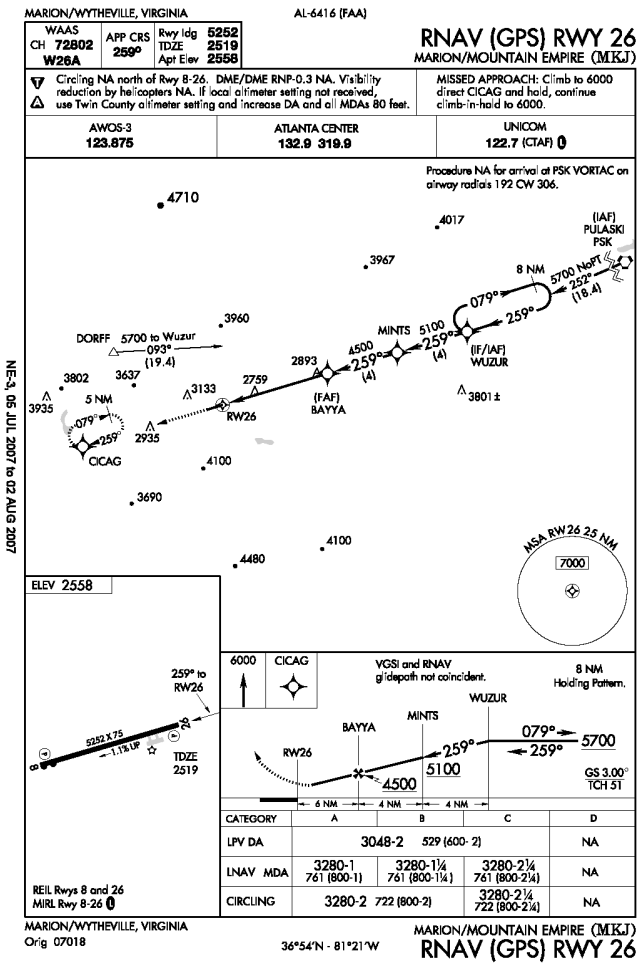
Overall Recommendations

RUNWAY 26		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions.	Standards.	Varies
Precision Approach Path Indicator Upgrade Runway 26 PAPI from a 2 box to a 4 box unit.	Provides improved visual vertical descent guidance information during the approach to the runway.	$20,000
New Procedure Request development of RNAV (RNP) RWY 26 approach.	Improves all-weather capability of the runway and airport.	No equipment cost

Mountain Empire (MKJ)

Marion/Wytheville, Virginia

Procedure Overview



RNAV (GPS) RWY 26 - LPV

FAA PROCEDURE DATA	
Critical Obstacle:	2756 **see note 1**
Required Obstacle Clearance:	
Remote Altimeter Adjustment:	
Accuracy Code Adjustment:	
Other Adjustment:	**see note 2**
Rounding Adjustment:	
Minimum Descent Altitude / Decision Height:	3048

Note 1: Tree

Note 2:

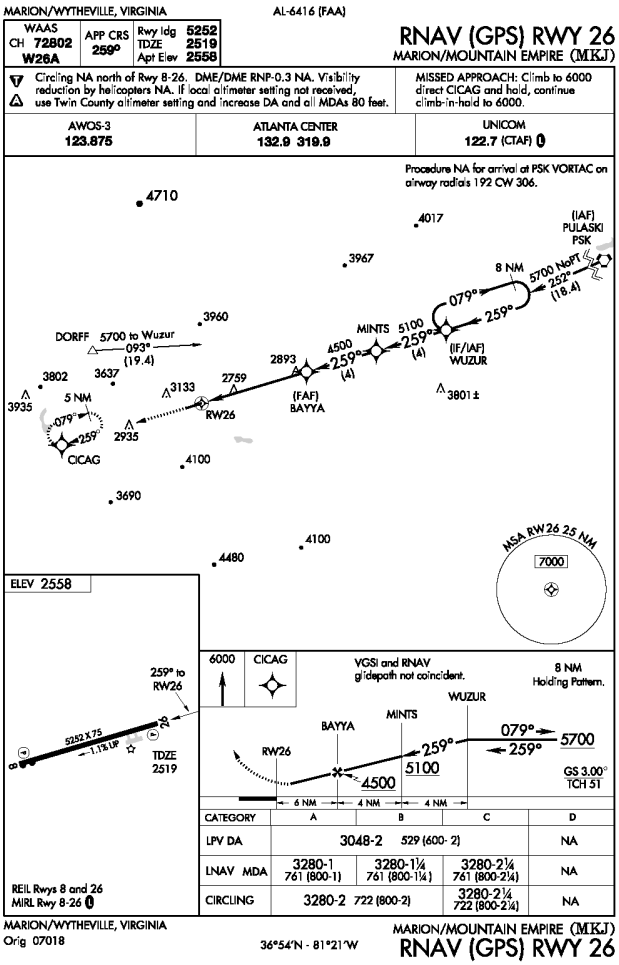
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1B - APPROACH PROCEDURE WITH VERTICAL GUIDANCE APPROACH REQUIREMENTS		
	>1 SM	**KNOWN DEFICIENCIES**
	REQUIRED	
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 4 and 8, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Mountain Empire (MKJ)

Marion/Wytheville, Virginia

Procedure Overview



RNAV (GPS) RWY 26 - LNAV

FAA PROCEDURE DATA		
Critical Obstacle:	2893	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:	106	**see note 2**
Rounding Adjustment:	31	
Minimum Descent Altitude / Decision Height:	3280	

Note 1: Tower (47-2034)

Note 2: missed approach segment, extended final approach segment

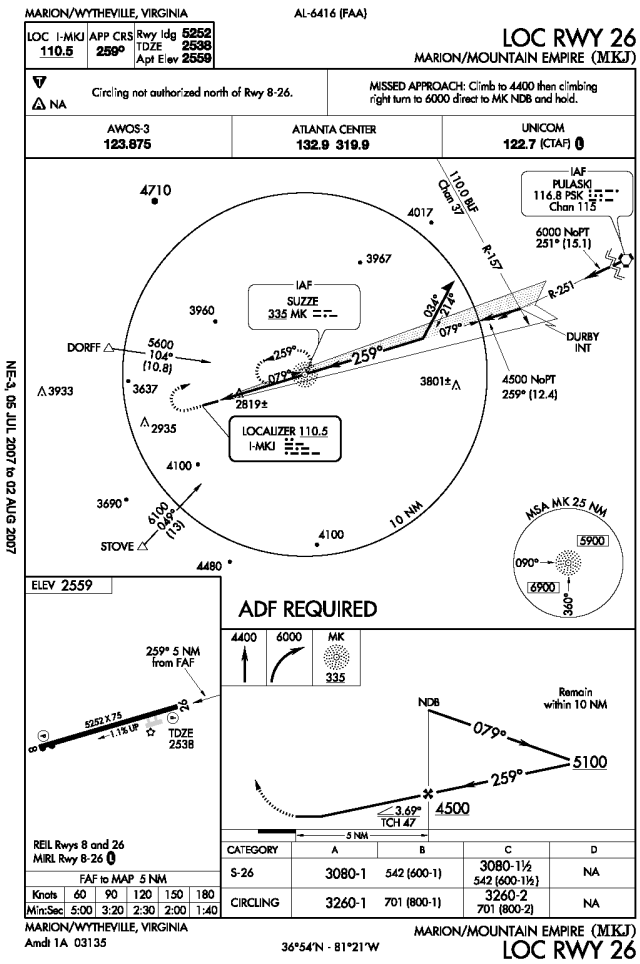
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	1 SM	**KNOWN DEFICIENCIES**
	REQUIRED	
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Mountain Empire (MKJ)

Marion/Wytheville, Virginia

Procedure Overview



LOC RWY 26

FAA PROCEDURE DATA		
Critical Obstacle:	2819	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	11	
Minimum Descent Altitude / Decision Height:	3080	

Note 1: 100' Tree

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Recommendations

RNAV (GPS) RWY 26		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Procedure Review Update touchdown zone elevation.	Procedure clarity.	No equipment cost

LOC RWY 26		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Procedure Review Request procedure be modified to eliminate ADF requirement.	Procedure simplification and improved reliability.	No equipment cost
Distance Measuring Equipment Install Distance Measuring Equipment (DME). Co-locate with the localizer.	Improves pilot's situational awareness and simplifies procedure.	$100,000
Marker Beacon Install an Outer Marker.	Improves pilot's situational awareness and simplifies procedure.	$50,000
Procedure Review Update touchdown zone elevation.	Procedure clarity.	No equipment cost
Procedure Review (Approach Category) Request addition of Approach Category D minimums to the procedure.	Improves accessibility of the airport.	No equipment cost

New Kent County (W96)

Quinton, Virginia

AIRPORT INFORMATION	
ROLE / CLASSIFICATION INFORMATION	
VATSP Classfication (2008):	General Aviation Community
NPIAS Role (2008):	General Aviation
Study Classification:	General Aviation Community

ACTIVITY INFORMATION	
Based Aircraft (2007):	41
Annual Operations (2020):	16489
Annual Enplanements (2020):	n/a

DEVELOPMENT INFORMATION (2008)	
Critical Airport Reference Code (Existing):	B-I (small)
Critical Airport Reference Code (Proposed):	B-I (small)
Airport Layout Plan (Original):	December, 2000
Airport Layout Plan (Revision):	July, 2001

Proposed Development (from ALD):
- Install AWOS-III

AERONAUTICAL SURVEY INFORMATION

Runway End	Survey Type	Survey Date
all	Photoslope	2001

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS	
Available Weather Reporting:	None
Common Traffic Advisory Frequency:	122.8
Clearance Delivery:	GCO

Nearby Navigational Aids:

RICHMOND	VORTAC	114.1	RIC	099°/ 9.3 NM TO FIELD
HOPEWELL	VORTAC	112	HPW	003°/ 10.5 NM TO FIELD
HARCUM	VORTAC	108.8	HCM	286°/ 20.0 NM TO FIELD

New Kent County (W96)

Quinton, Virginia

Instrument Approach Procedure Summary

Minimums listed are Category B

EXISTING PROCEDURES		
CIRCLING		
VOR-A	640 - 1 (417)	Orig A
RUNWAY 10		
RNAV (GPS) RWY 10 - LNAV	560 - 1 (437)	Orig A
RUNWAY 28		
RNAV (GPS) RWY 28 - LNAV	540 - 1 (417)	Orig A

PROCEDURES PROPOSED AS PART OF STUDY
RNAV (GPS) RWY 10 - LPV
RNAV (GPS) RWY 28 - LPV

VISIBILITY CHANGES PROPOSED AS PART OF STUDY	
none	

REVIEWER COMMENTS

Vertically-guided (LPV) satellite-based approaches are recommended to both Runway 10 and Runway 28. Additionally, it is recommended that the feasibility of a VOR RWY 28 be discussed with the FAA. The Airport Sponsor completed the requested informational survey.

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 10 28 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	B-I (small)	B-I (small)
Runway Dimensions (Length x Width in ft):	3600 x 75	3600 x 75
Runway to Taxiway Separation (feet):	150	150
Runway Lighting:	MIRL	MIRL
RUNWAY 10		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	250 x 450 x 1000	250 x 450 x 1000
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	PAPI; REILs	PAPI; REILs
RUNWAY 28		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	250 x 450 x 1000	250 x 450 x 1000
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	PAPI; REILs	PAPI; REILs

New Kent County (W96)

Quinton, Virginia

System Benchmarks

General Aviation Community			
Best Approach (Primary Runway End)			
BENCHMARK		**RUNWAY 28**	
Approach:	Ground-based	☑ meets	VOR-A
Ceiling:	500 AGL	☑ meets	
Visibility:	1 statute mile	☑ meets	
Approach:	LNAV	☑ meets	RNAV (GPS) RWY 28 - LNAV
Ceiling:	400 AGL	☐ meets	
Visibility:	1 statute mile	☑ meets	
Equipment:	REILs, MIRLs, PAPI	☐ meets	
Secondary Approach (Different Runway End)			
BENCHMARK		**RUNWAY 10**	
Approach:		☐ meets	n/a (no ground-based approach available)
Ceiling:		☐ meets	
Visibility:		☐ meets	
Approach:	LNAV	☑ meets	RNAV (GPS) RWY 10 - LNAV
Ceiling:	500 AGL	☑ meets	
Visibility:	1 statute mile	☑ meets	
Equipment:	REILs, MIRLs, PAPI	☐ meets	

Additional Requirements			
Weather:	Normally on-field, 24/7, data-linked	☐ meets	
Access to ATC Clearance:	RTR or GCO	☑ meets	
ADS-B Coverage:	1000 AGL	☐ meets	

Overall Recommendations

GENERAL		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove obstructions surrounding rotating beacon.	Improves visibility of rotating beacon.	Varies
Altimeter Source Install AWOS-A.	Provides local altimeter source.	$25,000
Communications Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	Improves pilot/controller communications and clearance delivery process.	Less than $5,000
Data link Provide ADS-B coverage at 1000 AGL or lower.	Provides traffic surveillance, terrain avoidance, weather data, etc. Crucial component for Next Generation Air Transportation System.	Unknown

RUNWAY 10		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions.	Standards.	Varies
Aeronautical Survey Request / complete aeronautical survey to enable development of LPV approach to Runway 10.	Provides survey data for instrument approach procedures.	$50,000
New Procedure Request development of RNAV (GPS) RWY 10 Approach with LPV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost

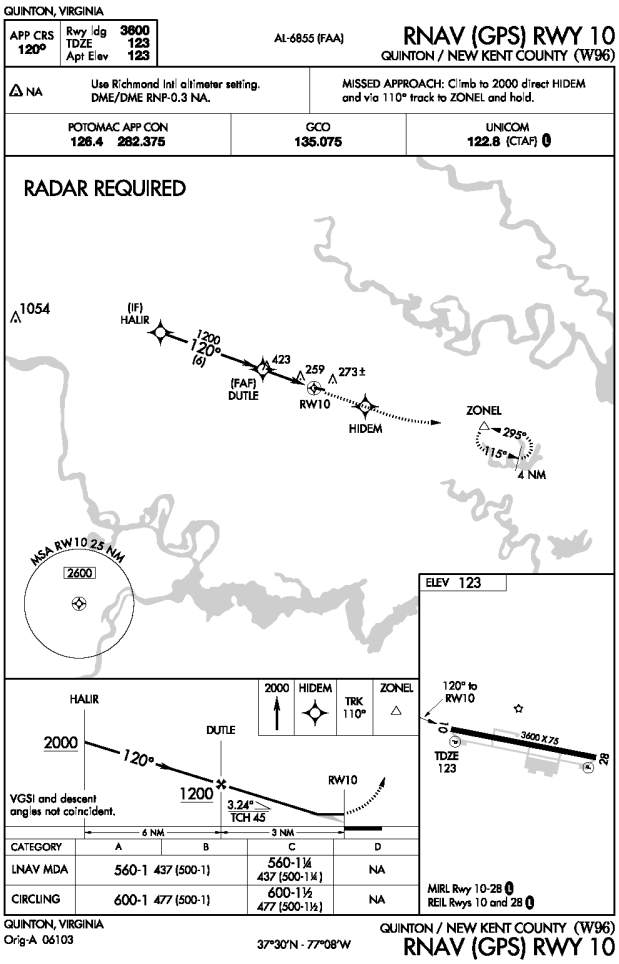
Overall Recommendations

RUNWAY 28		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions.	Standards.	Varies
New Procedure Request FAA evaluation of canceling VOR-A approach and replacing with VOR RWY 28 approach based on RIC VORTAC.	Improve all-weather capability of the runway and airport.	No equipment cost
Aeronautical Survey Request / complete aeronautical survey to enable development of LPV approach to Runway 28.	Provides survey data for instrument approach procedures.	$50,000 (duplicate)
New Procedure Request development of RNAV (GPS) RWY 28 Approach with LPV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost

New Kent County (W96)

Quinton, Virginia

Procedure Overview



RNAV (GPS) RWY 10 - LNAV

FAA PROCEDURE DATA		
Critical Obstacle:	269	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:	28	
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	13	
Minimum Descent Altitude / Decision Height:	560	

Note 1: 100' Tree

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

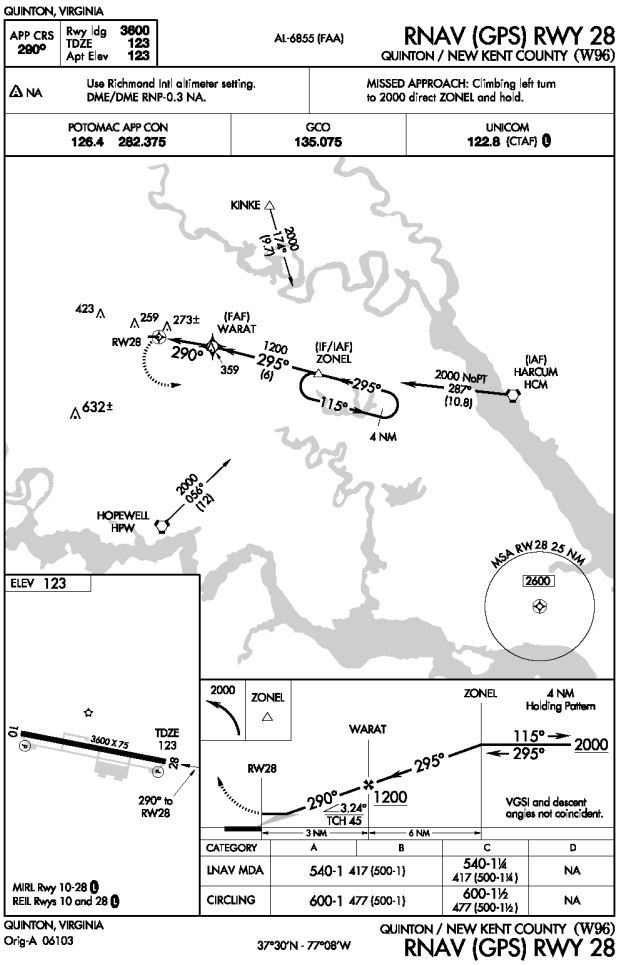
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

New Kent County (W96)

Quinton, Virginia

Procedure Overview



RNAV (GPS) RWY 28 - LNAV

FAA PROCEDURE DATA		
Critical Obstacle:	249	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:	28	
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	13	
Minimum Descent Altitude / Decision Height:	540	

Note 1: 100' Tree

Note 2:

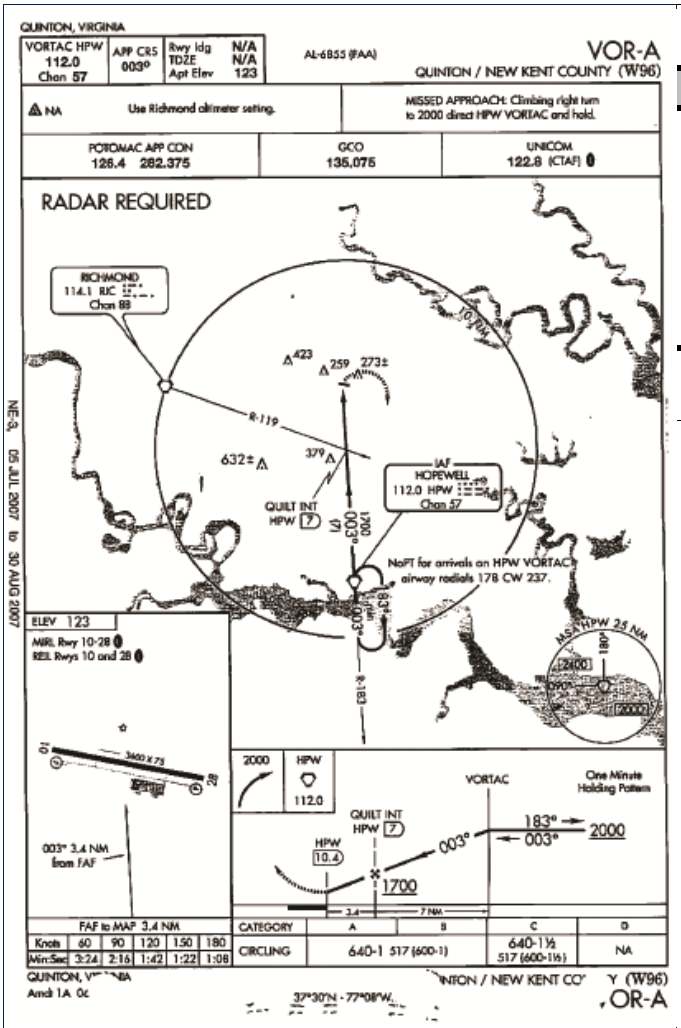
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	1 SM	**KNOWN DEFICIENCIES**
	REQUIRED	
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

New Kent County (W96)

Quinton, Virginia

Procedure Overview



VOR-A

FAA PROCEDURE DATA		
Critical Obstacle:	346	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:	28	
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	16	
Minimum Descent Altitude / Decision Height:	640	

Note 1: Tower

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	CIRCLING	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Recommended	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Visual (Basic)	None
Holding Position Signs and Markings	Visual (Basic)	None
Runway Edge Lights	MIRL / LIRL (for night minima only)	None
Parallel Taxiway	Recommended	None
Approach Lights	Not Required	Yes
Runway Design Standards	Not Required	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-2, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Recommendations

RNAV (GPS) RWY 10		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Altimeter Source Install AWOS-A and request FAA re-evaluation of remote altimeter setting source penalty. See Overall Recommendations.	Minimum Descent Altitude (MDA) may be reduced by 40 feet by eliminating the remote altimeter setting source (RASS) adjustment.	$25,000 (duplicate)

RNAV (GPS) RWY 28		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Altimeter Source Install AWOS-A and request FAA re-evaluation of remote altimeter setting source penalty. See Overall Recommendations.	Minimum Descent Altitude (MDA) may be reduced by 40 feet by eliminating the remote altimeter setting source (RASS) adjustment.	$25,000 (duplicate)

VOR A		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Altimeter Source Install AWOS-A and request FAA re-evaluation of remote altimeter setting source penalty. See Overall Recommendations.	Minimum Descent Altitude (MDA) may be reduced by 40 feet by eliminating the remote altimeter setting source (RASS) adjustment.	$25,000 (duplicate)
Procedure Review Request FAA evaluation of canceling VOR-A approach and replacing with VOR RWY 28 approach based on RIC VORTAC.	Improve all-weather capability of the runway and airport.	No equipment cost

New London (W90)

Forest, Virginia

AIRPORT INFORMATION	
ROLE / CLASSIFICATION INFORMATION	
VATSP Classfication (2008):	Local Service
NPIAS Role (2008):	n/a
Study Classification:	Local Service

ACTIVITY INFORMATION	
Based Aircraft (2007):	74
Annual Operations (2020):	41955
Annual Enplanements (2020):	n/a

DEVELOPMENT INFORMATION (2008)	
Critical Airport Reference Code (Existing):	n/a
Critical Airport Reference Code (Proposed):	n/a
Airport Layout Plan (Original):	n/a
Airport Layout Plan (Revision):	n/a
Proposed Development (from ALD):	

AERONAUTICAL SURVEY INFORMATION

Runway End	Survey Type	Survey Date
all	Photoslope	2006

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS	
Available Weather Reporting:	None
Common Traffic Advisory Frequency:	122.8
Clearance Delivery:	Phone

Nearby Navigational Aids:

LYNCHBURG	VORTAC	109.2	LYH	287°/ 4.9 NM TO FIELD
BOJAR	NDB	385	LY	285°/ 4.5 NM TO FIELD

New London (W90)

Forest, Virginia

REVIEWER COMMENTS

No published instrument approach procedures.

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 17 35 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	ALD not availabile	ALD not availabile
Runway Dimensions (Length x Width in ft):	ALD not available	ALD not availabile
Runway to Taxiway Separation (feet):	ALD not available	ALD not availabile
Runway Lighting:	ALD not availabile	ALD not availabile
RUNWAY 17		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	ALD Not Available	MISSING
Runway Markings:	ALD Not Available	ALD Not Available
Available Visual Approach Aids:	ALD Not Available	ALD Not Available
RUNWAY 35		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	ALD Not Available	MISSING
Runway Markings:	ALD Not Available	ALD Not Available
Available Visual Approach Aids:	ALD Not Available	ALD Not Available

New Market (8W2)

New Market, Virginia

AIRPORT INFORMATION	
ROLE / CLASSIFICATION INFORMATION	
VATSP Classfication (2008):	Local Service
NPIAS Role (2008):	n/a
Study Classification:	Local Service

ACTIVITY INFORMATION	
Based Aircraft (2007):	34
Annual Operations (2020):	18724
Annual Enplanements (2020):	n/a

DEVELOPMENT INFORMATION (2008)	
Critical Airport Reference Code (Existing):	n/a
Critical Airport Reference Code (Proposed):	n/a
Airport Layout Plan (Original):	n/a
Airport Layout Plan (Revision):	n/a

Proposed Development (from ALD):

- Install AWOS

AERONAUTICAL SURVEY INFORMATION

Runway End	Survey Type	Survey Date
all	Photoslope	2001

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS	
Available Weather Reporting:	None
Common Traffic Advisory Frequency:	122.8
Clearance Delivery:	Phone

Nearby Navigational Aids:

LINDEN	VORTAC	114.3	LDN	249°/ 26.4 NM TO FIELD
CAVERNS	NDB	245	LUA	266°/ 11.4 NM TO FIELD

New Market (8W2)

New Market, Virginia

REVIEWER COMMENTS

No published instrument approach procedures.

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 6 24 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	B-I (small)	B-I (small)
Runway Dimensions (Length x Width in ft):	2920 x 60	3050 x 60
Runway to Taxiway Separation (feet):	60	150
Runway Lighting:	LIRL	LIRL
RUNWAY 6		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	200 x 400 x 1000	200 x 400 x 1000
Runway Markings:	Visual	Visual
Available Visual Approach Aids:	none	VASI; REILs
RUNWAY 24		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	200 x 400 x 1000	200 x 400 x 1000
Runway Markings:	Visual	Visual
Available Visual Approach Aids:	none	VASI; REILs

New River Valley (PSK)

Dublin, Virginia

AIRPORT INFORMATION	
ROLE / CLASSIFICATION INFORMATION	
VATSP Classfication (2008):	General Aviation Regional
NPIAS Role (2008):	General Aviation
Study Classification:	General Aviation Regional (1/2 mile visibility)

ACTIVITY INFORMATION	
Based Aircraft (2007):	33
Annual Operations (2020):	9995
Annual Enplanements (2020):	n/a

DEVELOPMENT INFORMATION (2008)	
Critical Airport Reference Code (Existing):	B-II
Critical Airport Reference Code (Proposed):	C-III
Airport Layout Plan (Original):	December, 1996
Airport Layout Plan (Revision):	n/a

Proposed Development (from ALD):

- Upgrade to C-III
- Relocate parallel taxiway
- Complete parallel taxiway

AERONAUTICAL SURVEY INFORMATION

Runway End	Survey Type	Survey Date
all	Photoslope	2001
all	OC-PSK 5084	1986

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS	
Available Weather Reporting:	AWOS-III (PT)
Common Traffic Advisory Frequency:	122.7
Clearance Delivery:	RTR

Nearby Navigational Aids:

TECH	NDB	368	TEC	258°/ 13.8 NM TO FIELD
PULASKI	VORTAC	116.8	PSK	035°/ 3.4 NM TO FIELD
BLUEFIELD	VORTAC	110	BLF	115°/ 26.6 NM TO FIELD

New River Valley (PSK)

Dublin, Virginia

Instrument Approach Procedure Summary

Minimums listed are Category B

EXISTING PROCEDURES		
CIRCLING		
VOR OR GPS-A	2740 - 1 (635)	Amdt 8
RUNWAY 24		
RNAV (GPS) RWY 24 - LNAV	2460 - 1 (373)	Orig
RNAV (GPS) RWY 24 - LPV	2337 - 1 (250)	Orig
RNAV (GPS) RWY 24 - VNAV	2346 - 1 (259)	Orig
RUNWAY 6		
ILS RWY 6 - ILS	2314 - 1 (209)	Amdt 4
ILS RWY 6 - LOC	2620 - 1 (515)	Amdt 4
VOR/DME OR GPS RWY 6	2620 - 1 (515)	Amdt 7

PROCEDURES PROPOSED AS PART OF STUDY
RNAV (GPS) RWY 6 - LNAV
RNAV (GPS) RWY 6 - LPV
VOR/DME RWY 24

VISIBILITY CHANGES PROPOSED AS PART OF STUDY	
RUNWAY 6:	1 SM to 1/2 SM

REVIEWER COMMENTS

The Study recommends a reduction in visibility minimums from 1 mile to 3/4 mile. Additional information regarding the estimated impacts and costs associated with the visibility changes is included in Appendix E. Consider relocation of the ILS and MALSR to Runway 24, if the Runway 6 property interests and obstruction removal cannot be completed. The Airport Sponsor completed the requested informational survey.

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 6 24 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	B-II	C-III
Runway Dimensions (Length x Width in ft):	6201 x 150	6200 x 150
Runway to Taxiway Separation (feet):	250	400
Runway Lighting:	HIRL	HIRL
RUNWAY 6		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	1000 x 1750 x 2500	1000 x 1750 x 2500
Runway Markings:	Precision	Precision
Available Visual Approach Aids:	MALSR	PAPI; MALSR
RUNWAY 24		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 1010 x 1700	500 x 1010 x 1700
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	PAPI; REILs	PAPI; REILs

New River Valley (PSK)

Dublin, Virginia

System Benchmarks

General Aviation Regional (1/2 mile visibility)			
Best Approach (Primary Runway End)			
BENCHMARK		**RUNWAY 6**	
Approach:	ILS CAT I	☑ meets	ILS RWY 6 - ILS
Ceiling:	200 AGL	☐ meets	
Visibility:	1/2 statue mile	☐ meets	
Approach:	LPV	☐ meets	n/a (no satellite-based approach available)
Ceiling:	200 AGL	☐ meets	
Visibility:	1/2 statute mile	☐ meets	
Equipment:	MALSR, HIRLs, PAPI	☐ meets	existing MALSR, HIRLs
Secondary Approach (Different Runway End)			
BENCHMARK		**RUNWAY 24**	
Approach:	Ground-based	☐ meets	n/a (no ground-based approach available)
Ceiling:	400 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Approach:	LPV	☑ meets	RNAV (GPS) RWY 24 - LPV
Ceiling:	250 AGL	☑ meets	
Visibility:	1 statute mile	☑ meets	
Equipment:	REILs, HIRLs, PAPI	☑ meets	

Additional Requirements			
Weather:	on-field, 24/7, data-linked	☑ meets	
Access to ATC Clearance:	RTR	☑ meets	
ADS-B Coverage:	On ground	☐ meets	

Overall Recommendations

GENERAL		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Weather Reporting Upgrade existing AWOS-III to include freezing rain sensor.	Improves information available to pilot.	$50,000
Radar Coverage Improve radar coverage for west and north sectors of Roanoke's radar system.	Improved service.	Unknown
Data link Provide ADS-B coverage while on the ground.	Provides traffic surveillance, terrain avoidance, weather data, etc. Crucial component for Next Generation Air Transportation System.	$100,000
Local Area Augmentation System (LAAS) Provide LAAS coverage to augment existing global positioning system.	Provides enhanced signal accuracy.	Unknown

RUNWAY 6 24		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Airfield Lighting Control Change control sequence and/or facility directory note for HIRLs to be preset on low intensity with higher intensity activated on CTAF.	Provides visibilty of landing environment during night and adverse weather conditions even during times of aircraft equipment failure or pilot control system malfunction.	Less than $10,000

Overall Recommendations

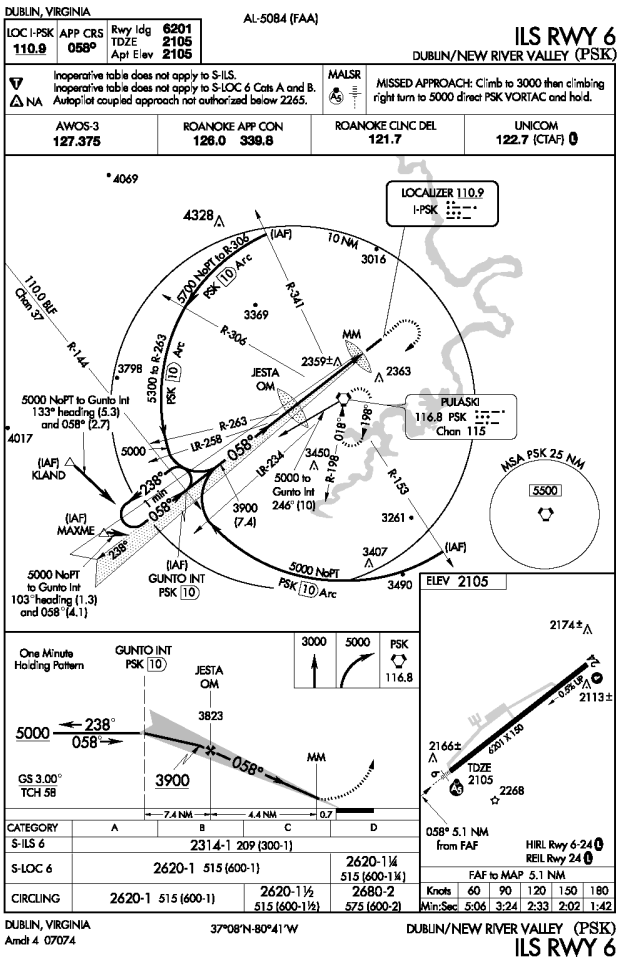
RUNWAY 6		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions.	Standards.	Varies
Precision Approach Path Indicator Install 4-box PAPI for Runway 6.	Provides visual vertical descent guidance information during the approach to the runway.	$70,000
Aeronautical Survey Request / complete aeronautical survey to enable development of LNAV and LPV approaches to Runway 6.	Provides survey data for instrument approach procedures.	$50,000
Visibility Minimum Upon acceptance of visibility credit, different design standards apply (less than 1 mile).	Lower landing visibility minimum.	$2,800,000
New Procedure Request development of RNAV (GPS) RWY 6 Approach with LPV and LNAV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost

RUNWAY 24		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions.	Standards.	Varies

New River Valley (PSK)

Dublin, Virginia

Procedure Overview



ILS RWY 6 - ILS

FAA PROCEDURE DATA	
Critical Obstacle:	**see note 1**
Required Obstacle Clearance:	
Remote Altimeter Adjustment:	
Accuracy Code Adjustment:	
Other Adjustment:	**see note 2**
Rounding Adjustment:	
Minimum Descent Altitude / Decision Height:	2314

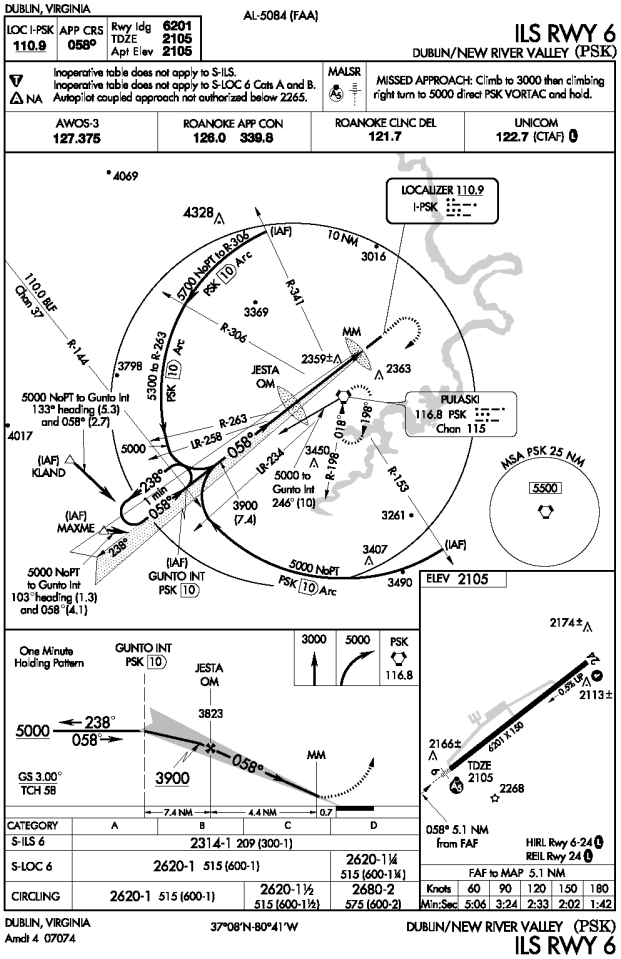
Note 1: Pole

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1A - PRECISION INSTRUMENT APPROACH REQUIREMENTS		
	1 SM	**KNOWN DEFICIENCIES**
	REQUIRED	
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	4,200 ft (Paved)	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	Partial
Approach Lights	Recommended	None
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 8, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Procedure Overview



ILS RWY 6 - LOC

FAA PROCEDURE DATA		
Critical Obstacle:	2359	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	11	
Minimum Descent Altitude / Decision Height:	2620	

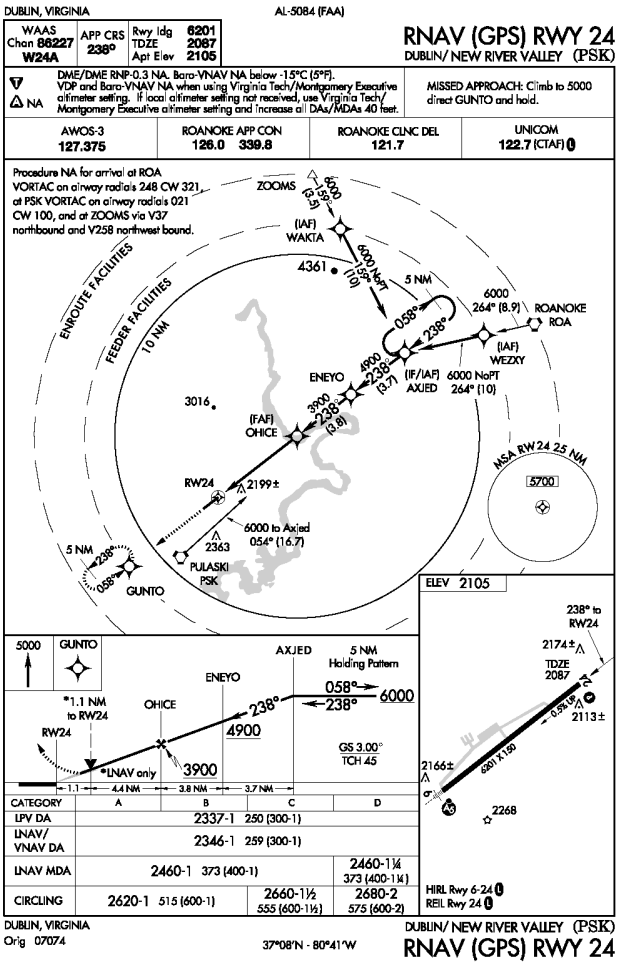
Note 1: 100' Tree 2C

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	Partial
Approach Lights	Recommended	None
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Overview



RNAV (GPS) RWY 24 - LPV

FAA PROCEDURE DATA	
Critical Obstacle:	**see note 1**
Required Obstacle Clearance:	
Remote Altimeter Adjustment:	
Accuracy Code Adjustment:	
Other Adjustment:	**see note 2**
Rounding Adjustment:	
Minimum Descent Altitude / Decision Height:	2337

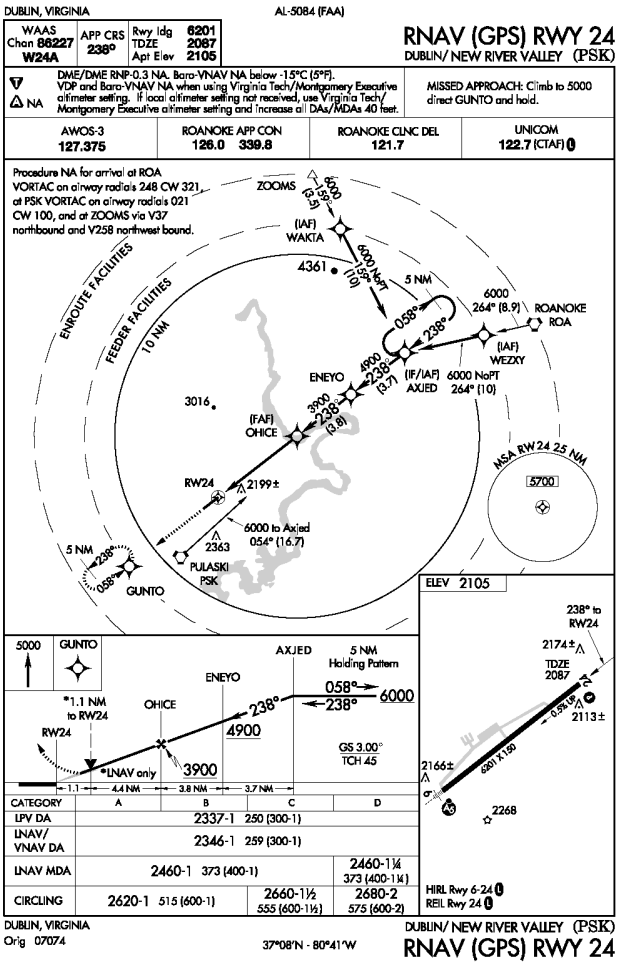
Note 1: ASC

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1B - APPROACH PROCEDURE WITH VERTICAL GUIDANCE APPROACH REQUIREMENTS		
	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	Partial
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 4 and 8, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Procedure Overview



RNAV (GPS) RWY 24 - VNAV

FAA PROCEDURE DATA	
Critical Obstacle:	**see note 1**
Required Obstacle Clearance:	
Remote Altimeter Adjustment:	
Accuracy Code Adjustment:	
Other Adjustment:	**see note 2**
Rounding Adjustment:	8
Minimum Descent Altitude / Decision Height:	2346

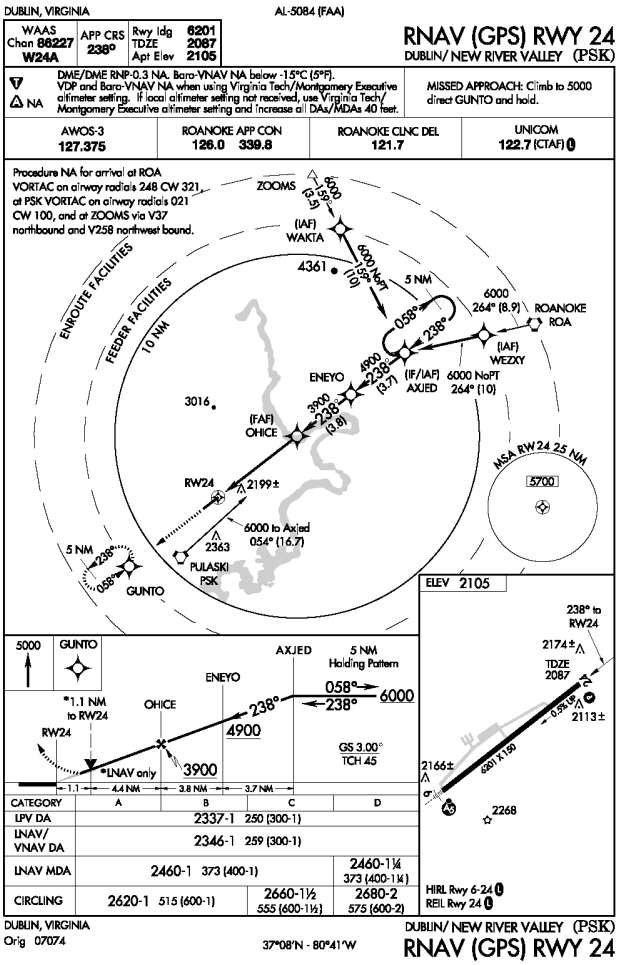
Note 1: PDA

Note 2: missed approach segment

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1B - APPROACH PROCEDURE WITH VERTICAL GUIDANCE APPROACH REQUIREMENTS		
	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	Partial
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 4 and 8, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Procedure Overview



RNAV (GPS) RWY 24 - LNAV

FAA PROCEDURE DATA		
Critical Obstacle:	2199	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	11	
Minimum Descent Altitude / Decision Height:	2460	

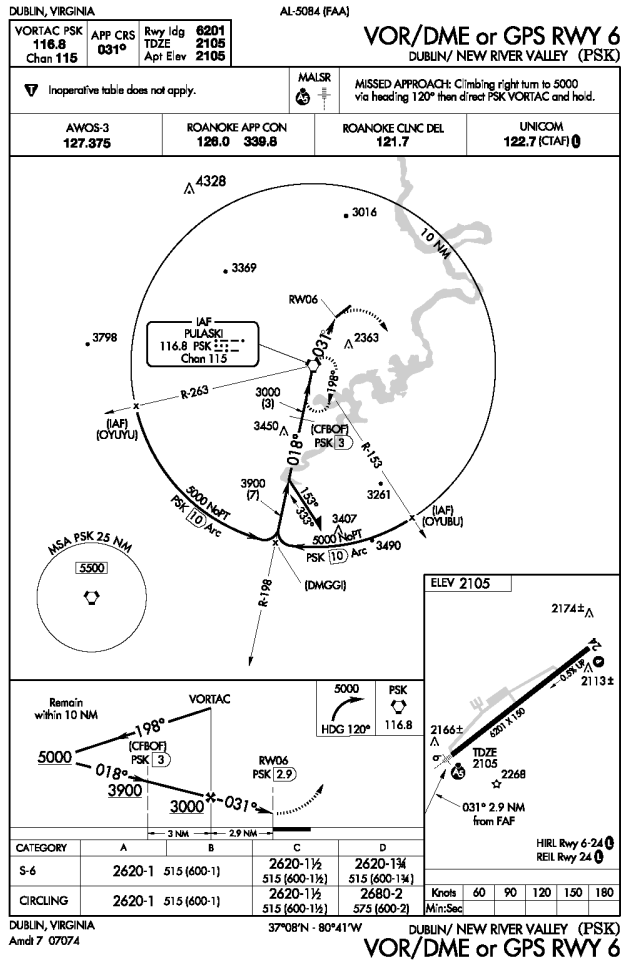
Note 1: 100' Tree 2C

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	Partial
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Overview



VOR/DME OR GPS RWY 6

FAA PROCEDURE DATA		
Critical Obstacle:	2359	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	11	
Minimum Descent Altitude / Decision Height:	2620	

Note 1: 100' Tree 2C

Note 2:

Note 3:

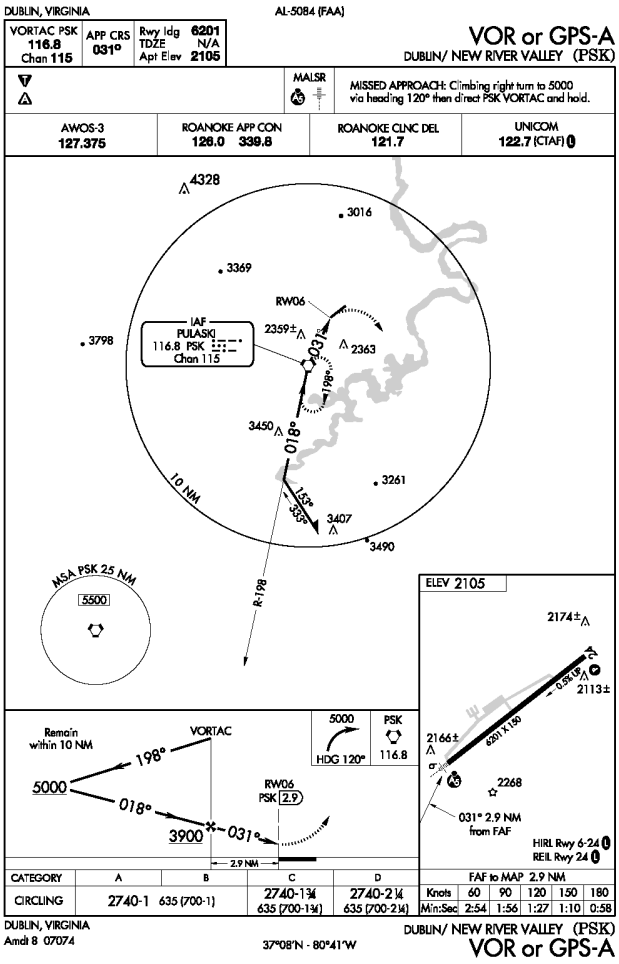
NE-3, 05 JUL 2007 to 02 AUG 2007

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	1 SM	**KNOWN DEFICIENCIES**
	REQUIRED	
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	Partial
Approach Lights	Recommended	None
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

New River Valley (PSK)

Dublin, Virginia

Procedure Overview



VOR OR GPS-A

FAA PROCEDURE DATA		
Critical Obstacle:	2359	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:	131	**see note 2**
Rounding Adjustment:		
Minimum Descent Altitude / Decision Height:	2740	

Note 1: 100' Tree 2C

Note 2: descent gradient

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	CIRCLING	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Recommended	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Visual (Basic)	None
Holding Position Signs and Markings	Visual (Basic)	None
Runway Edge Lights	MIRL / LIRL (for night minima only)	None
Parallel Taxiway	Recommended	Partial
Approach Lights	Not Required	None
Runway Design Standards	Not Required	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-2, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Recommendations

ILS OR LOC RWY 6		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Procedure Review Request FAA re-evaluation to obtain visibility credit for existing MALSR system.	Improves landing visibility minimum.	No equipment cost
Distance Measuring Equipment Install Distance Measuring Equipment (DME). Co-locate with the localizer.	Improves pilot's situational awareness and simplifies procedure.	$200,000

VOR / DME OR GPS RWY 6		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Procedure Review Cancel GPS overlay procedure when RNAV (GPS) RWY 6 procedure is commissioned.	Procedure clarity.	No equipment cost

RNAV (GPS) RWY 24		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a

Procedure Recommendations

VOR OR GPS A		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Procedure Review Cancel GPS overlay procedure when RNAV (GPS) RWY 6 procedure is commissioned.	Procedure clarity.	No equipment cost

Newport News/Williamsburg Intl (PHF)

Newport News, Virginia

AIRPORT INFORMATION

ROLE / CLASSIFICATION INFORMATION	
VATSP Classfication (2008):	Commercial Service
NPIAS Role (2008):	Primary, Small Hub
Study Classification:	Commercial Service (<1 million, >= 200k enplanements)

ACTIVITY INFORMATION	
Based Aircraft (2007):	118
Annual Operations (2020):	278059
Annual Enplanements (2020):	384880

DEVELOPMENT INFORMATION (2008)	
Critical Airport Reference Code (Existing):	D-V
Critical Airport Reference Code (Proposed):	D-V
Airport Layout Plan (Original):	October, 1996
Airport Layout Plan (Revision):	n/a

Proposed Development (from ALD):

- Parallel RWY 7-25
- Extend RWY 7R-25L (2000')
- Extend RWY 2-20 (3474')
- Install MALSR (RWYS 2, 20, 25L)
- Install ILS (RWY 20)

AERONAUTICAL SURVEY INFORMATION

Runway End	Survey Type	Survey Date
all	Photoslope	2001
all	OC-PHF 957	1995
25	C	1996
7	PIR	1996
20	C	1996
2	C	1996
20	ANA-LPV	underway

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS

Available Weather Reporting:	ASOS
Common Traffic Advisory Frequency:	118.7
Clearance Delivery:	Direct

Nearby Navigational Aids:

NORFOLK	VORTAC	116.9	ORF	323°/ 20.1 NM TO FIELD
HENRY	NDB	375	PJS	AT FIELD
HARCUM	VORTAC	108.8	HCM	158°/ 21.7 NM TO FIELD
FELKER	NDB	226	FAF	104°/ 6.0 NM TO FIELD
CAPE CHARLES	VORTAC	112.2	CCV	251°/ 27.0 NM TO FIELD

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Instrument Approach Procedure Summary

Minimums listed are Category B

EXISTING PROCEDURES		
RUNWAY 2		
NDB RWY 2	700 - 1 (661)	Amdt 5
RNAV (GPS) RWY 2 - LNAV	480 - 1 (441)	Orig
RUNWAY 20		
NDB RWY 20	860 - 1 (817)	Amdt 4
RNAV (GPS) RWY 20 - LNAV	440 - 1 (397)	Orig
RUNWAY 25		
ILS OR LOC RWY 25 - ILS	241 - 3/4 (200)	Orig
ILS OR LOC RWY 25 - LOC	440 - 1 (399)	Orig
RNAV (GPS) RWY 25 - LNAV	460 - 1 (379)	Amdt 1
RNAV (GPS) RWY 25 - LPV	420 - 1 1/4 (379)	Amdt 1
RNAV (GPS) RWY 25 - VNAV	480 - 1 1/2 (439)	Amdt 1
RUNWAY 7		
ILS RWY 7 - ILS	240 - 2400 (200)	Amdt 31
ILS RWY 7 - LOC	440 - 2400 (400)	Amdt 31
RNAV (GPS) RWY 7 - LNAV	460 - 2400 (420)	Amdt 1
RNAV (GPS) RWY 7 - VNAV	440 - 5000 (400)	Amdt 1

PROCEDURES PROPOSED AS PART OF STUDY
ILS RWY 7 (CAT II)
LOC RWY 20
RNAV (GPS) RWY 2 - LPV
RNAV (GPS) RWY 20 - LPV
RNAV (GPS) RWY 7 - LPV

VISIBILITY CHANGES PROPOSED AS PART OF STUDY	
RUNWAY 7:	2400 RVR to 1200 RVR
RUNWAY 20:	1 SM to 3/4 SM
RUNWAY 25:	3/4 SM to 1800 RVR

REVIEWER COMMENTS

Vertically-guided (LPV) satellite-based approaches are recommended for each runway end. Approach lighting system additions and upgrades are also included for RWY 20, RWY 7 and RWY 25. The Study recommends a reduction in landing visibility minimums. Additional information regarding the estimated impacts and costs associated with the visibility changes is included in Appendix E.

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 2 20 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	D-V	D-V
Runway Dimensions (Length x Width in ft):	6526 x 150	8000/10000 x 150
Runway to Taxiway Separation (feet):	510	400
Runway Lighting:	HIRL	HIRL
RUNWAY 2		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 1010 x 1700	1000 x 1750 x 2500
Runway Markings:	Non-Precision	Precision
Available Visual Approach Aids:	VASI; REILs	PAPI; MALSR
RUNWAY 20		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 1010 x 1700	500 x 1010 x 1700
Runway Markings:	Non-Precision	Precision
Available Visual Approach Aids:	VASI; REILs	PAPI; MALSR
RUNWAY 7L 25R INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):		C-III/D-V
Runway Dimensions (Length x Width in ft):		6000/8000 x 150
Runway to Taxiway Separation (feet):		400
Runway Lighting:		HIRL
RUNWAY 7L		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	n/a	1000 x 1750 x 2500
Runway Markings:	n/a	Precision
Available Visual Approach Aids:	n/a	PAPI; MALSR
RUNWAY 25R		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	n/a	500 x 1010 x 1700
Runway Markings:	n/a	Precision
Available Visual Approach Aids:	n/a	PAPI; MALSR
RUNWAY 7R 25L INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	D-V	D-V
Runway Dimensions (Length x Width in ft):	8003 x 150	10000 x 150
Runway to Taxiway Separation (feet):	400	400
Runway Lighting:	HIRL	HIRL

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 7R		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	1000 x 1750 x 2500	1000 x 1750 x 2500
Runway Markings:	Precision	Precision
Available Visual Approach Aids:	MALSR	PAPI; MALSR
RUNWAY 25L		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 1010 x 1700	500 x 1010 x 1700
Runway Markings:	Precision	Precision
Available Visual Approach Aids:	VASI; REILs	PAPI; MALSR

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System Benchmarks

Commercial Service (<1 million, > 200k enplanements)			
Best Approach (Primary Runway End)			
BENCHMARK		**RUNWAY 7**	
Approach:	ILS CAT I	☑ meets	ILS RWY 7 - ILS
Ceiling:	200 AGL	☑ meets	
Visibility:	1800 RVR	☐ meets	
Approach:	LPV	☐ meets	RNAV (GPS) RWY 7 - VNAV
Ceiling:	200 AGL	☐ meets	
Visibility:	1800 RVR	☐ meets	
Equipment:	ALSF-2 or MALSR, TDZ, CL, HIRLs, RVR, PAPI	☐ meets	existing MALSR, HIRLs, RVR
Secondary Approach (Different Runway End)			
BENCHMARK		**RUNWAY 25**	
Approach:	ILS CAT I	☑ meets	ILS OR LOC RWY 25 - ILS
Ceiling:	200 AGL	☑ meets	
Visibility:	2400 RVR	☐ meets	
Approach:	LPV	☐ meets	RNAV (GPS) RWY 25 - LNAV
Ceiling:	200 AGL	☐ meets	
Visibility:	2400 RVR	☐ meets	
Equipment:	ALSF-2 or MALSR, TDZ, CL, HIRLs, RVR, PAPI	☐ meets	existing HIRLs, VASI
All Ends of Instrument Runways			
BENCHMARK		**RUNWAY 2**	
Approach:	Ground-based	☑ meets	NDB RWY 2
Ceiling:	400 AGL	☐ meets	
Visibility:	1 statute mile	☑ meets	
Approach:	LPV	☐ meets	RNAV (GPS) RWY 2 - LNAV
Ceiling:	400 AGL	☐ meets	
Visibility:	1 statute mile	☑ meets	
Equipment:	REILs, HIRLs, PAPI	☐ meets	existing HIRLs, VASI

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BENCHMARK		RUNWAY 20	
Approach:	Ground-based	☑ meets	NDB RWY 20
Ceiling:	400 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Approach:	LPV	☐ meets	RNAV (GPS) RWY 20 - LNAV
Ceiling:	400 AGL	☑ meets	
Visibility:	1 statute mile	☑ meets	
Equipment:	REILs, HIRLs, PAPI	☑ meets	

Weather:	on-field, 24/7, data-linked	☑ meets	
Access to ATC Clearance:	Direct	☑ meets	
ADS-B Coverage:	On ground	☐ meets	

Overall Recommendations

GENERAL		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Data link Provide ADS-B coverage while on the ground.	Provides traffic surveillance, terrain avoidance, weather data, etc. Crucial component for Next Generation Air Transportation System.	$100,000
Local Area Augmentation System (LAAS) Provide LAAS coverage to augment existing global positioning system.	Provides enhanced signal accuracy.	Unknown
RUNWAY 7 25		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Runway Lighting Install centerline lights for Runway 7-25.	Improves visibility of runway environment, allows lower landing and take-off visibility minima, maintains landing visibiliity minima below 3/4 statute mile when runway markings are obscured by snow (TERPS 3.1.3).	$800,000
RUNWAY 2		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Runway End Identifier Lights Install REILs for Runway 2.	Improves pilot's ability to detect the landing environment.	$100,000
Aeronautical Survey Request / complete aeronautical survey to enable development of LPV approach to Runway 2.	Provides survey data for instrument approach procedures.	Underway
New Procedure Request development of RNAV (GPS) RWY 2 Approach with LPV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost

Overall Recommendations

RUNWAY 20		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions (tree).	Standards.	Varies
Approach Lighting System Install a MALS for Runway 20.	Improves pilot's ability to detect the landing environment.	$650,000
Visibility Minimum Upon installation of approach lighting system and subsequent acceptance of visibility credit, different design standards apply (less than 1 mile).	Lower landing visibility minimum.	$4,000,000
Aeronautical Survey Request / complete aeronautical survey to enable development of LPV approach to Runway 20.	Provides survey data for instrument approach procedures.	Underway
New Procedure Request development of RNAV (GPS) RWY 20 Approach with LPV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost
New Procedure Install localizer and request development of LOC RWY 20 Approach.	Improve all-weather capability of the runway and airport. Provides high-quality, ground-based approach to crosswind runway. Landing minimums may be as low as 420-1 (377).	$400,000

Overall Recommendations

RUNWAY 7		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions (tree).	Standards.	Varies
Precision Approach Path Indicator Install 4-box PAPI for Runway 7.	Provides visual vertical descent guidance information during the approach to the runway.	$200,000
Approach Lighting System Upgrade MALSR to ALSF-II for Runway 7.	Improves pilot's ability to detect the landing environment.	$5,000,000
Runway Lighting Install touchdown zone lights for Runway 7.	Improves visibility of runway environment, allows lower landing visibility minima, maintains landing visibiliity minima below 3/4 statute mile when runway markings are obscured by snow (TERPS 3.1.3).	$800,000
Visibility Minimum Upon installation of the ALSF-2 approach lighting system, different design standards apply.	Lower landing visibility minimum.	$1,000,000
Weather Reporting Install midfield and roll-out Runway Visual Range (RVR) equipment.	Replaces prevailing visibility measurement.	$600,000
New Procedure Request development of ILS RWY 7 (CAT II).	Improve all-weather capability of the runway and airport. Landing minimums may be reduced to as low as 140-1200 (100) with the addition of centerline lights, touchdown zone lights and the ALSF-II approach lighting	$800,000 (does not include required lighting)
Aeronautical Survey Request / update aeronautical survey to enable development of LPV approach to Runway 7.	Provides survey data for instrument approach procedures.	$70,000

Overall Recommendations

RUNWAY 7		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
New Procedure Request development of RNAV (GPS) RWY 7 Approach with LPV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost

RUNWAY 25		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions.	Standards.	Varies
Weather Reporting Install Runway Visual Range (RVR) equipment.	Replaces prevailing visibility measurement.	$400,000
Approach Lighting System Install MALSR for Runway 25.	Improves pilot's ability to detect the landing environment.	$1,250,000
Runway Lighting Install touchdown zone lights for Runway 25.	Improves visibility of runway environment, allows lower landing visibility minima, maintains landing visibiliity minima below 3/4 statute mile when runway markings are obscured by snow (TERPS 3.1.3).	$800,000
Visibility Minimum Upon installation of approach lighting system and subsequent acceptance of visibility credit, different design standards apply.	Lower landing visibility minimum from 3/4 sm to 1200 RVR.	$500,000

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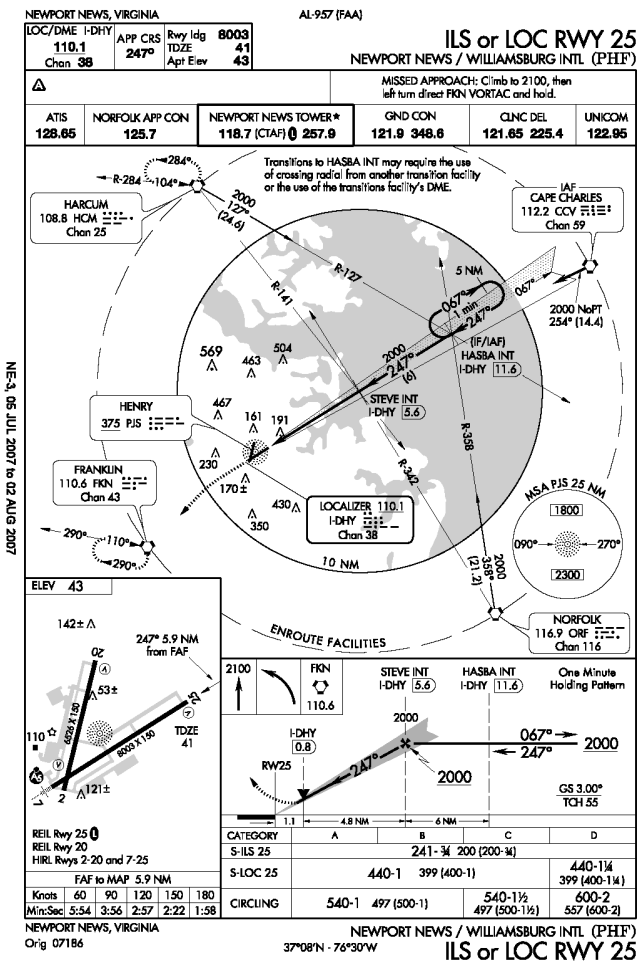
Procedure Overview



ILS OR LOC RWY 25 - ILS

FAA PROCEDURE DATA	
Critical Obstacle:	**see note 1**
Required Obstacle Clearance:	
Remote Altimeter Adjustment:	
Accuracy Code Adjustment:	
Other Adjustment:	**see note 2**
Rounding Adjustment:	
Minimum Descent Altitude / Decision Height:	241

Note 1: ASC

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1A - PRECISION INSTRUMENT APPROACH REQUIREMENTS

	<1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	4,200 ft (Paved)	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 8, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

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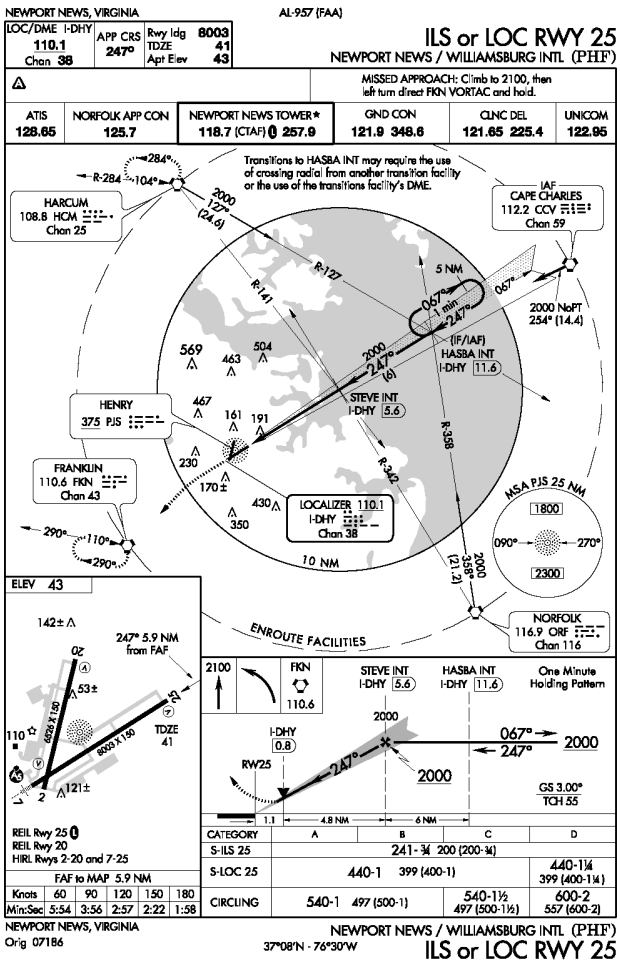
Newport News, Virginia

Procedure Overview



ILS OR LOC RWY 25 - LOC

FAA PROCEDURE DATA		
Critical Obstacle:	191	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:	-8	**see note 2**
Rounding Adjustment:	7	
Minimum Descent Altitude / Decision Height:	440	

Note 1: Tower (KPHF0056)

Note 2: secondary area adjustment

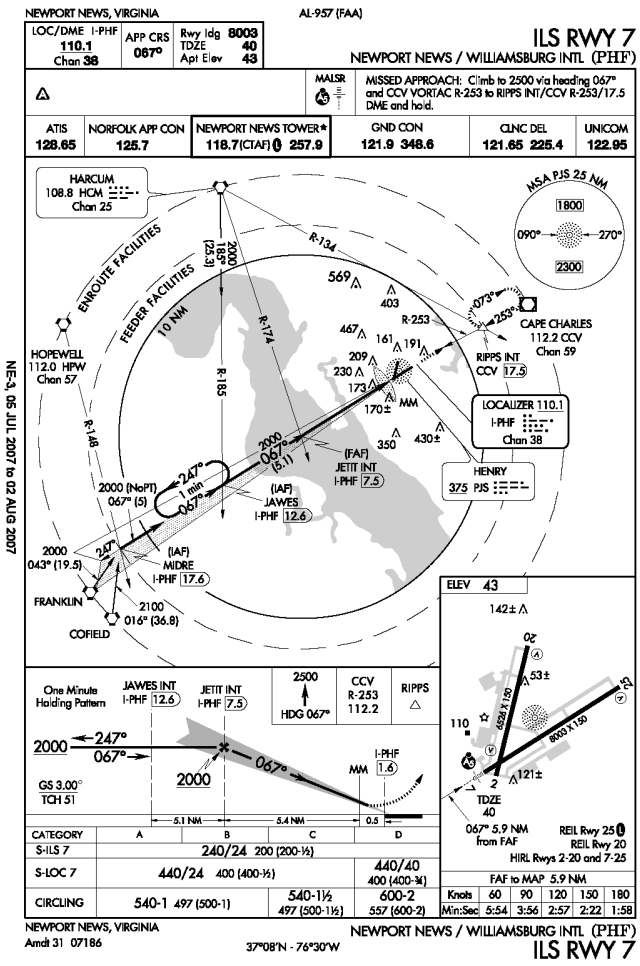
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Overview



ILS RWY 7 - ILS

FAA PROCEDURE DATA	
Critical Obstacle:	**see note 1**
Required Obstacle Clearance:	
Remote Altimeter Adjustment:	
Accuracy Code Adjustment:	
Other Adjustment:	**see note 2**
Rounding Adjustment:	
Minimum Descent Altitude / Decision Height:	240

Note 1: ASC

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1A - PRECISION INSTRUMENT APPROACH REQUIREMENTS

	<3/4 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	34:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	4,200 ft (Paved)	None
Runway Markings	Precision	None
Holding Position Signs and Markings	Precision	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	MALSR, SSALR, or ALSF	None
Runway Design Standards	<3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 9, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

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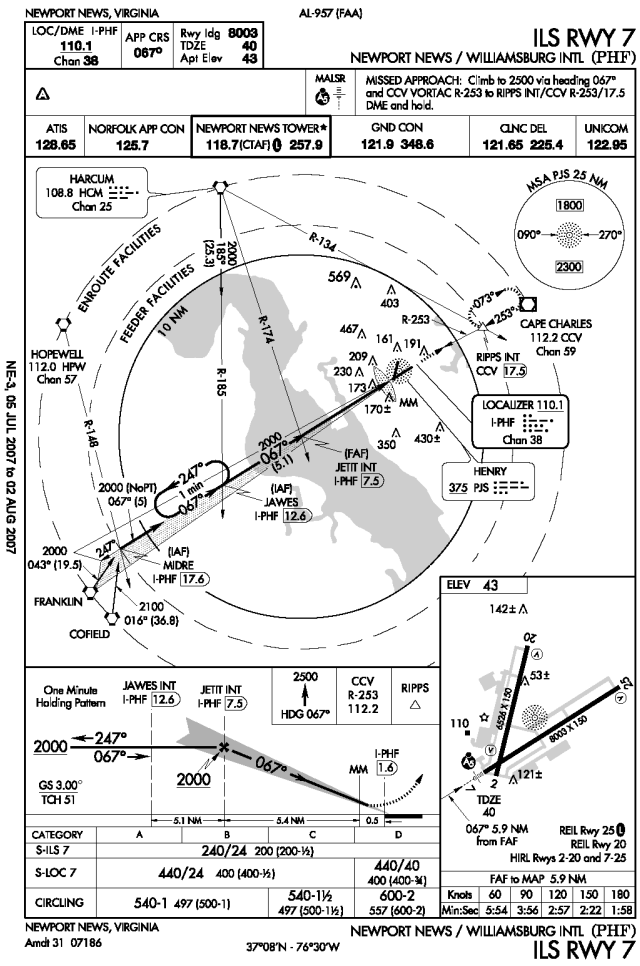
Newport News, Virginia

Procedure Overview



ILS RWY 7 - LOC

FAA PROCEDURE DATA		
Critical Obstacle:	173	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	17	
Minimum Descent Altitude / Decision Height:	440	

Note 1: Ant (KPHF0002)

Note 2:

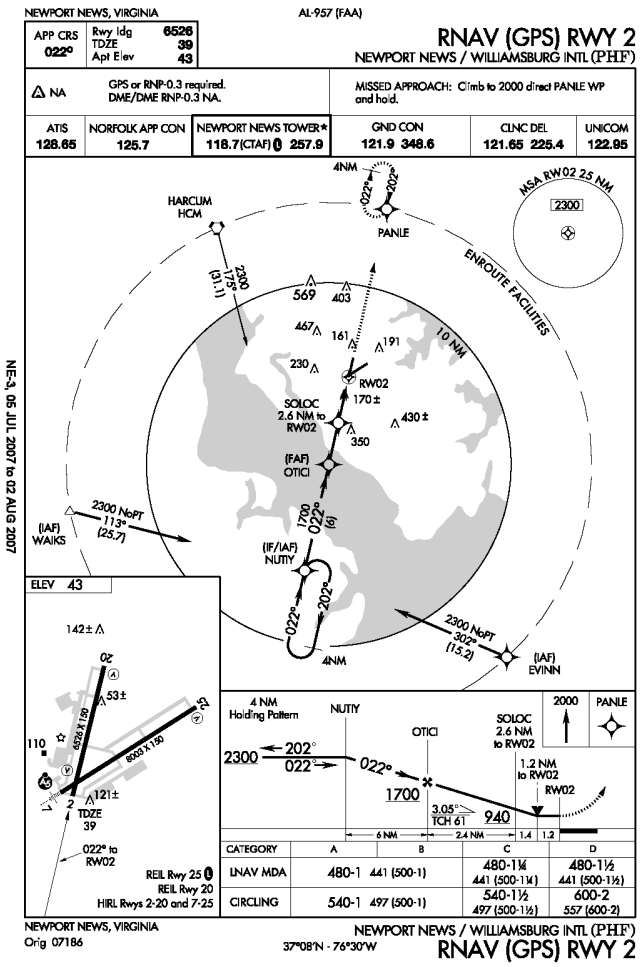
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	<3/4 SM	**KNOWN DEFICIENCIES**
	REQUIRED	
TERPS Paragraph 251	34:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	4,200 ft (Paved)	None
Runway Markings	Precision	None
Holding Position Signs and Markings	Precision	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	MALSR, SSALR, or ALSF Required	None
Runway Design Standards	<3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 9, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Newport News/Williamsburg Intl (PHF)

Newport News, Virginia

Procedure Overview



RNAV (GPS) RWY 2 - LNAV

FAA PROCEDURE DATA		
Critical Obstacle:	227	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	3	
Minimum Descent Altitude / Decision Height:	480	

Note 1: Stack (47-0629)

Note 2:

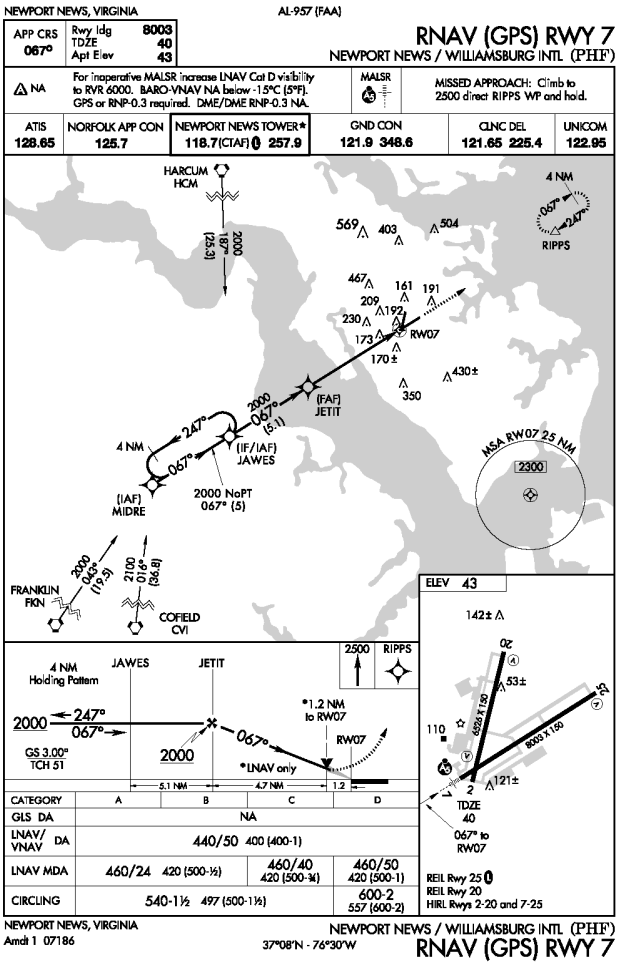
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	1 SM	**KNOWN DEFICIENCIES**
	REQUIRED	
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Newport News/Williamsburg Intl (PHF)

Newport News, Virginia

Procedure Overview



RNAV (GPS) RWY 7 - VNAV

FAA PROCEDURE DATA		
Critical Obstacle:	173	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	17	
Minimum Descent Altitude / Decision Height:	440	

Note 1: TWR (KPHF0002)

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1B - APPROACH PROCEDURE WITH VERTICAL GUIDANCE APPROACH REQUIREMENTS

	<1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft (Paved)	None
Runway Markings	Nonprecision (precision recommended)	None
Holding Position Signs and Markings	Nonprecision (precision recommended)	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	Required	None
Runway Design Standards	<3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 4 and 9, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Newport News/Williamsburg Intl (PHF)

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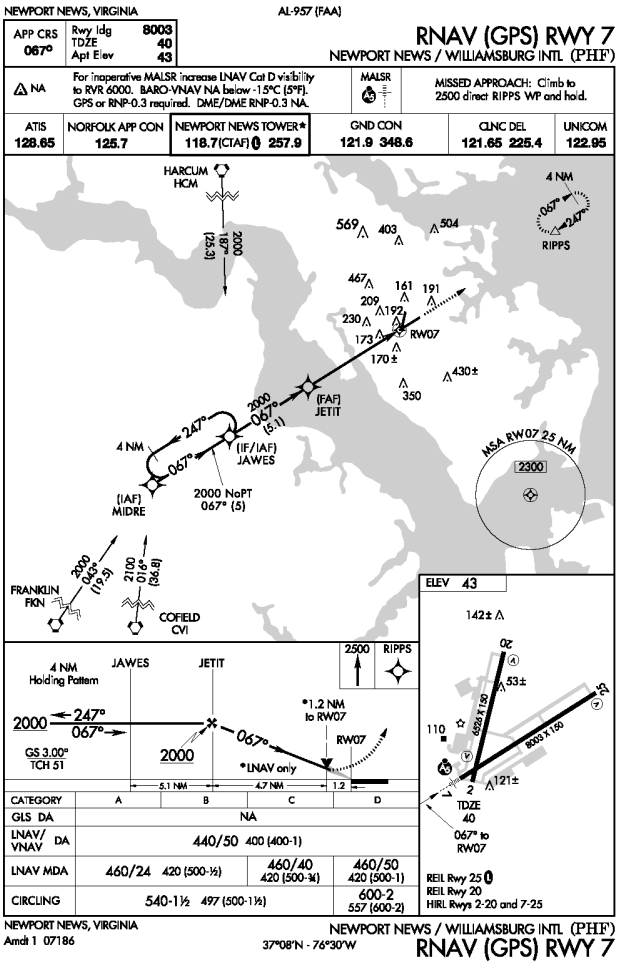
Procedure Overview



RNAV (GPS) RWY 7 - LNAV

FAA PROCEDURE DATA		
Critical Obstacle:	192	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	18	
Minimum Descent Altitude / Decision Height:	460	

Note 1: Control TWR

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	<3/4 SM	KNOWN DEFICIENCIES
	REQUIRED	
TERPS Paragraph 251	34:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	4,200 ft (Paved)	None
Runway Markings	Precision	None
Holding Position Signs and Markings	Precision	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	MALSR, SSALR, or ALSF Required	None
Runway Design Standards	<3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 9, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Newport News/Williamsburg Intl (PHF)

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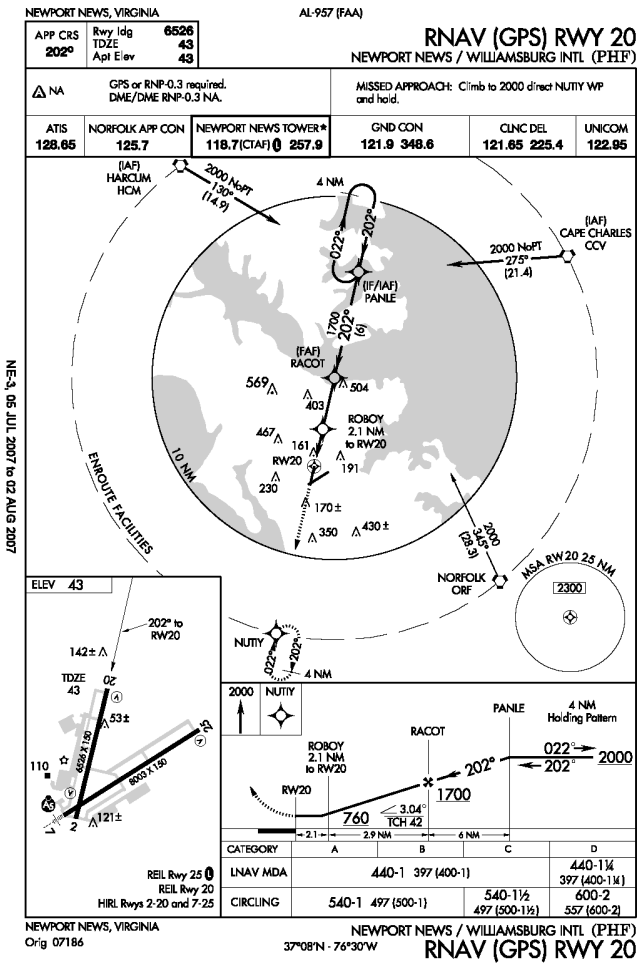
Procedure Overview



RNAV (GPS) RWY 20 - LNAV

FAA PROCEDURE DATA		
Critical Obstacle:	161	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:	20	**see note 2**
Rounding Adjustment:	9	
Minimum Descent Altitude / Decision Height:	440	

Note 1: TWR (KPHF0057)

Note 2: missed approach segment

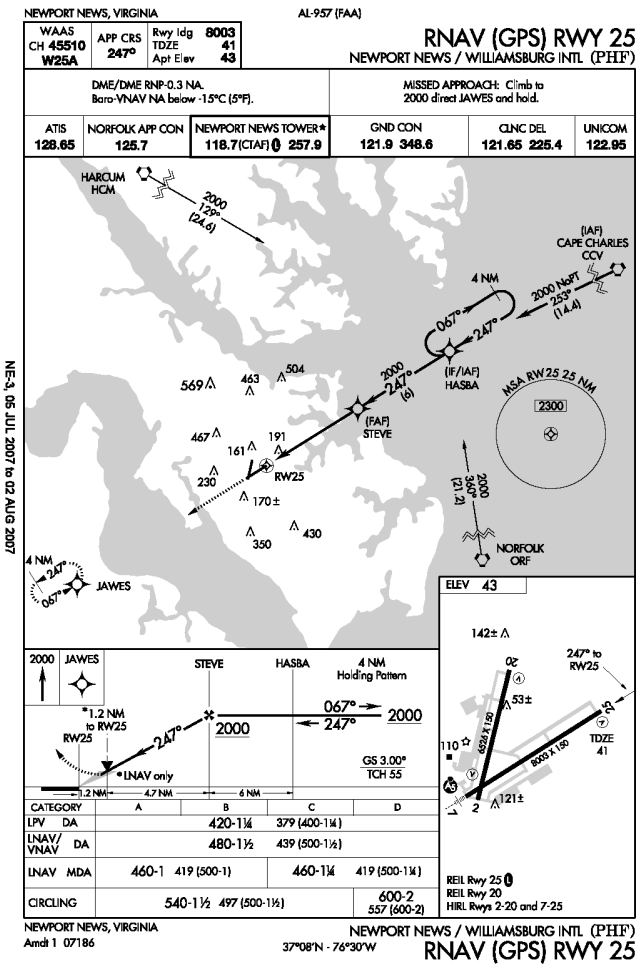
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	1 SM	**KNOWN DEFICIENCIES**
	REQUIRED	
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Newport News/Williamsburg Intl (PHF)

Newport News, Virginia

Procedure Overview



RNAV (GPS) RWY 25 - LPV

FAA PROCEDURE DATA	
Critical Obstacle:	176 **see note 1**
Required Obstacle Clearance:	
Remote Altimeter Adjustment:	
Accuracy Code Adjustment:	
Other Adjustment:	**see note 2**
Rounding Adjustment:	
Minimum Descent Altitude / Decision Height:	420

Note 1: Tower (KPHF0055)

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

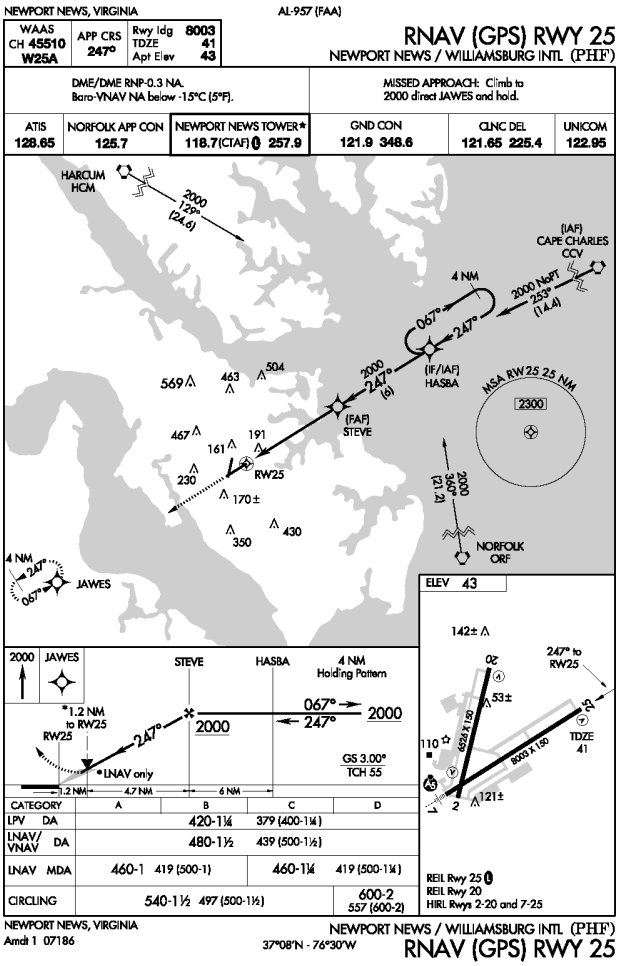
TABLE A16-1B - APPROACH PROCEDURE WITH VERTICAL GUIDANCE APPROACH REQUIREMENTS

	>1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 4 and 8, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Newport News/Williamsburg Intl (PHF)

Newport News, Virginia

Procedure Overview



RNAV (GPS) RWY 25 - VNAV

FAA PROCEDURE DATA	
Critical Obstacle:	191 **see note 1**
Required Obstacle Clearance:	
Remote Altimeter Adjustment:	
Accuracy Code Adjustment:	
Other Adjustment:	**see note 2**
Rounding Adjustment:	
Minimum Descent Altitude / Decision Height:	480

Note 1: Tower (KPHF0056)

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

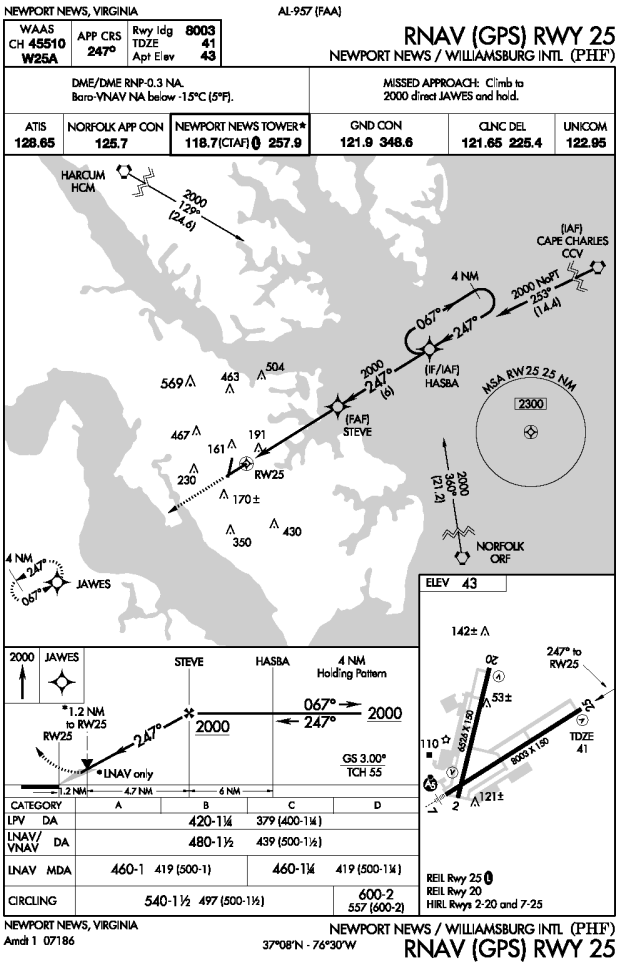
TABLE A16-1B - APPROACH PROCEDURE WITH VERTICAL GUIDANCE APPROACH REQUIREMENTS

	>1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 4 and 8, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Newport News/Williamsburg Intl (PHF)

Newport News, Virginia

Procedure Overview



RNAV (GPS) RWY 25 - LNAV

FAA PROCEDURE DATA		
Critical Obstacle:	191	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	19	
Minimum Descent Altitude / Decision Height:	460	

Note 1: Tower (KPHF0056)

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

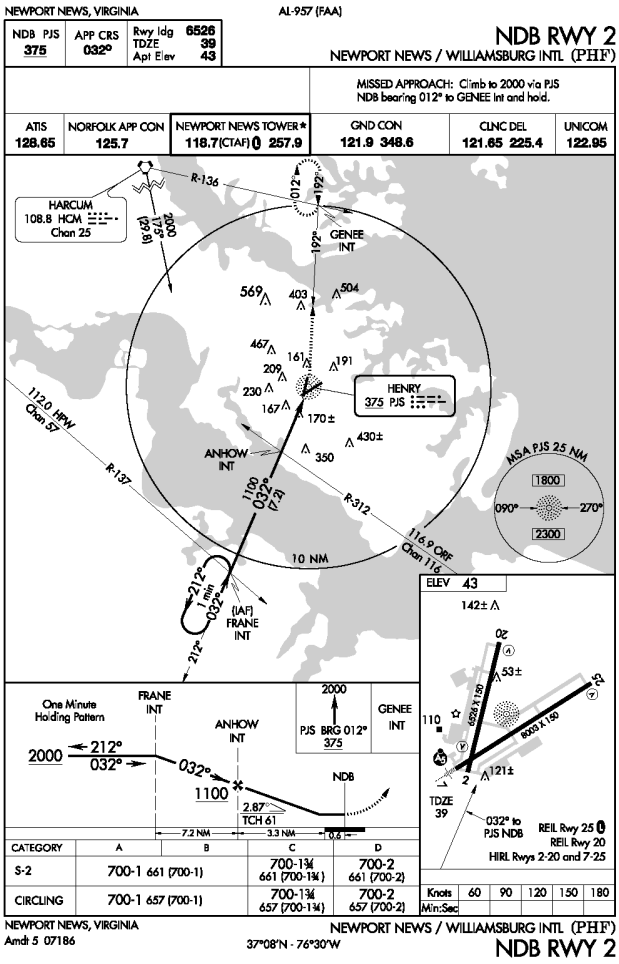
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Newport News/Williamsburg Intl (PHF)

Newport News, Virginia

Procedure Overview



NDB RWY 2

FAA PROCEDURE DATA		
Critical Obstacle:	350	see note 1
Required Obstacle Clearance:	300	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:	50	
Other Adjustment:		see note 2
Rounding Adjustment:	0	
Minimum Descent Altitude / Decision Height:	700	

Note 1: Tower (47-0573)

Note 2:

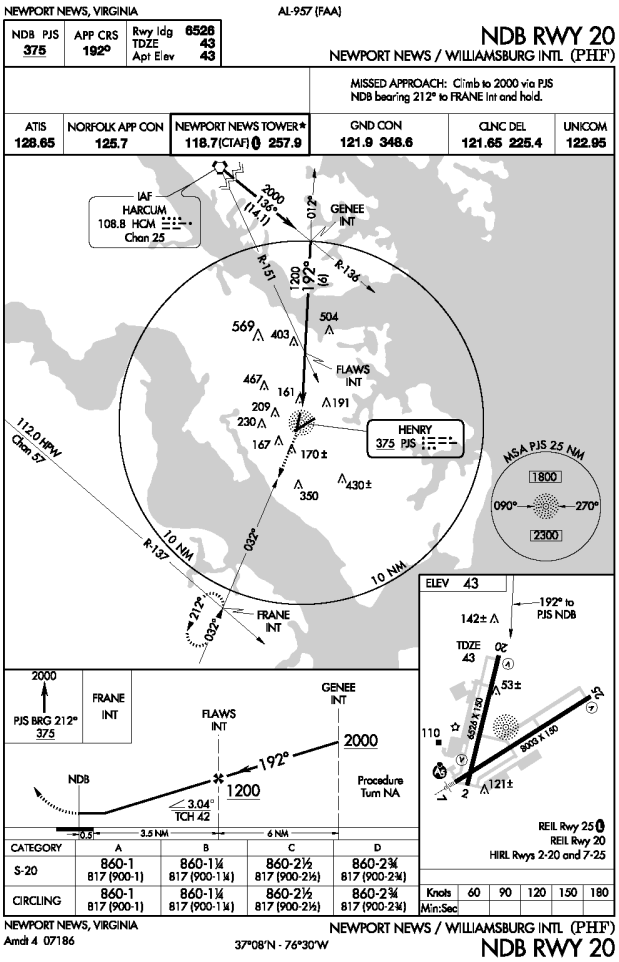
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	1 SM	KNOWN DEFICIENCIES
	REQUIRED	
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Newport News/Williamsburg Intl (PHF)

Newport News, Virginia

Procedure Overview



NDB RWY 20

FAA PROCEDURE DATA		
Critical Obstacle:	504	**see note 1**
Required Obstacle Clearance:	300	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:	50	
Other Adjustment:		**see note 2**
Rounding Adjustment:	6	
Minimum Descent Altitude / Decision Height:	860	

Note 1: Stack (47-0070)

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Recommendations

RNAV (GPS) RWY 20		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a

RNAV (GPS) RWY 25		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Weather Reporting Install Runway Visual Range (RVR) equipment. See Overall Recommendations.	Reduces visibility minimum to as low as 2400 feet RVR.	$400,000 (duplicate)
Visibility Minimum Upon installation of approach lighting syste and RVR, request procedure be updated to 2400 RVR. With the addition of centerline and touchdown zone lighting, minimums as low as 1800 RVR may be obtained.	Lower landing visibility minimum.	See Overall Recommendations

NDB RWY 2		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Procedure Review Cancel procedure.	Allows decommissioning of NDB.	No equipment cost

Procedure Recommendations

NDB RWY 20		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Procedure Review Cancel procedure.	Allows decommissioning of NDB.	No equipment cost

ILS OR LOC RWY 25		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Approach Lighting System Install MALSR for Runway 25. See Overall Recommendations.	Lowers landing minimums to as low as 200 - 1/2.	$1,250,000 (duplicate)
Weather Reporting Install Runway Visual Range (RVR) equipment. See Overall Recommendations.	Reduces visibility minimum to as low as 2400 feet RVR.	$400,000 (duplicate)
Visibility Minimum Upon installation of approach lighting system and RVR, request procedure be updated to 2400 RVR. With the addition of centerline and touchdown zone lighting, minimums as low as 1800 RVR may be obtained.	Lower landing visibility minimum.	See Overall Recommendations

Procedure Recommendations

ILS RWY 7		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Approach Lighting System Upgrade MALSR to ALSF-II for Runway 7. See Overall Recommendations.	Required component for CAT II ILS.	$5,000,000 (duplicate)
Visibility Minimum Upon installation of approach lighting system and RVR, request procedure be updated to 2400 RVR. With the addition of centerline and touchdown zone lighting, minimums as low as 1800 RVR may be obtained.	Lower landing visibility minimum.	See Overall Recommendations
Runway Lighting Install touchdown zone lights for Runway 7.	Improves visibility of runway environment, allows lower landing visibility minima, maintains landing visibiliity minima below 3/4 statute mile when runway markings are obscured by snow (TERPS 3.1.3). Required	$800,000 (duplicate)
Runway Lighting Install centerline lights for Runway 7-25.	Improves visibility of runway environment, allows lower landing and take-off visibility minima, maintains landing visibiliity minima below 3/4 statute mile when runway markings are obscured by snow (TERPS 3.1.3).	$800,000 (duplicate)
New Procedure Request development of ILS RWY 7 (CAT II). Requires upgrade of localizer and glide slope equipment.	Improve all-weather capability of the runway and airport.	$800,000 (does not include required lighting)

RNAV (GPS) RWY 2		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a

Procedure Recommendations

RNAV (GPS) RWY 7		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a

Norfolk International (ORF)

Norfolk, Virginia

AIRPORT INFORMATION	
ROLE / CLASSIFICATION INFORMATION	
VATSP Classfication (2008):	Commercial Service
NPIAS Role (2008):	Primary, Medium Hub
Study Classification:	Commercial Service (>= 1 million enplanements)

ACTIVITY INFORMATION	
Based Aircraft (2007):	99
Annual Operations (2020):	178257
Annual Enplanements (2020):	38323698

DEVELOPMENT INFORMATION (2008)	
Critical Airport Reference Code (Existing):	D-IV
Critical Airport Reference Code (Proposed):	D-IV
Airport Layout Plan (Original):	n/a
Airport Layout Plan (Revision):	February, 1999

Proposed Development (from ALD):

- Extend RWY 32 (824')
- Parallel RWY 5-23
- Install CAT III ILS (RWY 5L)
- Install ALSF (RWY 5L)
- Displace RWY 23 threshold

AERONAUTICAL SURVEY INFORMATION

Runway End	Survey Type	Survey Date
all	Photoslope	2001
all	OC-ORF 291	1996
32	C	1996
14	C	1996
23	PIR	1996
5	PIR	1996

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS	
Available Weather Reporting:	ASOS
Common Traffic Advisory Frequency:	120.8
Clearance Delivery:	Direct

Nearby Navigational Aids:

PORTSMOUTH	NDB	241	PVG	070° 13.6 NM TO FIELD
NORFOLK	VORTAC	116.9	ORF	AT FIELD
CAPE CHARLES	VORTAC	112.2	CCV	210° 28.9 NM TO FIELD

Norfolk International (ORF)

Norfolk, Virginia

Instrument Approach Procedure Summary

Minimums listed are Category B

EXISTING PROCEDURES		
RUNWAY 14		
RNAV (GPS) RWY 14 - LNAV	420 - 1 (395)	Orig A
VOR/DME RWY 14	440 - 1 (415)	Amdt 2D
RUNWAY 23		
ILS RWY 23 - ILS	321 - 3/4 (295)	Amdt 6E
ILS RWY 23 - LOC	400 - 3/4 (374)	Amdt 6E
RNAV (GPS) RWY 23 - LNAV	420 - 3/4 (394)	Orig B
RNAV (GPS) RWY 23 - VNAV	420 - 3/4 (394)	Orig B
VOR RWY 23	420 - 3/4 (394)	Amdt 8C
RUNWAY 32		
RNAV (GPS) RWY 32 - LNAV	440 - 1 (415)	Orig A
RNAV (GPS) RWY 32 - VNAV	420 - 1 1/2 (395)	Orig A
VOR/DME RWY 32	440 - 1 (415)	Amdt 4D
RUNWAY 5		
ILS RWY 5 - ILS	226 - 1800 (200)	Amdt 24E
ILS RWY 5 - LOC	480 - 2400 (414)	Amdt 24E
RNAV (GPS) RWY 5 - LNAV	640 - 2400 (614)	Orig
VOR/DME RWY 5	480 - 4000 (454)	Amdt 4C

PROCEDURES PROPOSED AS PART OF STUDY
ILS RWY 5 (CAT II and CAT III)
RNAV (GPS) RWY 14 - LPV
RNAV (GPS) RWY 23 - LPV
RNAV (GPS) RWY 32 - LPV
RNAV (GPS) RWY 5 - LPV

VISIBILITY CHANGES PROPOSED AS PART OF STUDY	
RUNWAY 5:	1800 RVR to 0 RVR
RUNWAY 23:	3/4 SM to 1800 RVR

REVIEWER COMMENTS

The Study includes recommendations to allow for the development of CAT II and CAT III procedures. Vertically-guided (LPV) satellite-based approaches are also recommended. The Study recommends a reduction in landing visibility minimums. Additional information regarding the estimated impacts and costs associated with the visibility changes is included in Appendix E.

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 14 32 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	C-III	C-III
Runway Dimensions (Length x Width in ft):	4875 x 150	5700 x 150
Runway to Taxiway Separation (feet):	400	400
Runway Lighting:	MIRL	MIRL
RUNWAY 14		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 1010 x 1700	500 x 1010 x 1700
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	PAPI; REILs	PAPI; REILs
RUNWAY 32		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 1010 x 1700	500 x 1010 x 1700
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	PAPI; REILs	PAPI; REILs
RUNWAY 5L 23R INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	D-IV	D-IV
Runway Dimensions (Length x Width in ft):	9001 x 150	9001 x 150
Runway to Taxiway Separation (feet):	400	400
Runway Lighting:	HIRL	HIRL
RUNWAY 5L		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	1000 x 1750 x 2500	1000 x 1750 x 2500
Runway Markings:	Precision	Precision
Available Visual Approach Aids:	PAPI; CL; TDZ	PAPI; CL; TDZ; ALSF-II
RUNWAY 23R		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	1000 x 1750 x 2500	1000 x 1750 x 2500
Runway Markings:	Precision	Precision
Available Visual Approach Aids:	PAPI; CL; MALSR	PAPI; CL; MALSR
RUNWAY 5R 23L INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):		C-IV (MOD)
Runway Dimensions (Length x Width in ft):		7800 x 150
Runway to Taxiway Separation (feet):		323
Runway Lighting:		MIRL

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 5R		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	n/a	500 x 1010 x 1700
Runway Markings:	n/a	Non-Precision
Available Visual Approach Aids:	n/a	PAPI; REILs
RUNWAY 23L		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	n/a	500 x 1010 x 1700
Runway Markings:	n/a	Non-Precision
Available Visual Approach Aids:	n/a	PAPI; REILs

Norfolk International (ORF)

Norfolk, Virginia

System Benchmarks

Commercial Service (> 1 million enplanements)			
Best Approach (Primary Runway End)			
BENCHMARK		**RUNWAY 5**	
Approach:	ILS CAT III	☐ meets	ILS RWY 5 - ILS
Ceiling:	100 AGL	☐ meets	
Visibility:	1200 RVR	☐ meets	
Approach:	LPV	☐ meets	RNAV (GPS) RWY 5 - LNAV
Ceiling:	200 AGL	☐ meets	
Visibility:	1800 RVR	☐ meets	
Equipment:	ALSF-2, TDZ, CL, HIRLs, RVR, PAPI	☐ meets	existing MALSR, TDZ, CL, HIRLs, RVR, PAPI
Secondary Approach (Different Runway End)			
BENCHMARK		**RUNWAY 23**	
Approach:	ILS CAT I	☑ meets	ILS RWY 23 - ILS
Ceiling:	200 AGL	☐ meets	
Visibility:	1800 RVR	☐ meets	
Approach:	LPV	☐ meets	RNAV (GPS) RWY 23 - VNAV
Ceiling:	200 AGL	☐ meets	
Visibility:	1800 RVR	☐ meets	
Equipment:	ALSF-2 or MALSR, TDZ, CL, HIRLs, RVR, PAPI	☐ meets	existing MALSR, CL, HIRLs, PAPI
All Ends of Instrument Runways			
BENCHMARK		**RUNWAY 14**	
Approach:	Ground-based	☑ meets	VOR/DME RWY 14
Ceiling:	400 AGL	☐ meets	
Visibility:	1 statute mile	☑ meets	
Approach:	LPV	☐ meets	RNAV (GPS) RWY 14 - LNAV
Ceiling:	400 AGL	☑ meets	
Visibility:	1 statute mile	☑ meets	
Equipment:	REILs, HIRLs, PAPI	☐ meets	existing REILs, PAPI

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BENCHMARK		RUNWAY 32	
Approach:	Ground-based	☑ meets	VOR/DME RWY 32
Ceiling:	400 AGL	☐ meets	
Visibility:	1 statute mile	☑ meets	
Approach:	LPV	☐ meets	RNAV (GPS) RWY 32 - VNAV
Ceiling:	400 AGL	☑ meets	
Visibility:	1 statute mile	☐ meets	
Equipment:	REILs, HIRLs, PAPI	☐ meets	existing REILs, PAPI

Weather:	on-field, 24/7, data-linked	☑ meets	
Access to ATC Clearance:	Direct	☑ meets	
ADS-B Coverage:	On ground	☐ meets	

Overall Recommendations

GENERAL		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Data link Provide ADS-B coverage while on the ground.	Provides traffic surveillance, terrain avoidance, weather data, etc. Crucial component for Next Generation Air Transportation System.	$100,000
Local Area Augmentation System (LAAS) Provide LAAS coverage to augment existing global positioning system.	Provides enhanced signal accuracy.	Unknown

Overall Recommendations

RUNWAY 5		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions (trees).	Standards.	Varies
Approach Lighting System Upgrade MALSR to ALSF-II for Runway 5.	Improves pilot's ability to detect the landing environment.	$5,000,000
Visibility Minimum Upon installation of approach lighting system and subsequent acceptance of visibility credit, different design standards apply.	Lower landing visibility minimum.	$1,000,000
Weather Reporting Install midfield and roll-out Runway Visual Range (RVR) equipment.	Replaces prevailing visibility measurement.	$600,000
New Procedure Request development of ILS RWY 5 (CAT II) and ILS RWY 5 (CAT III) approaches.	Improve all-weather capability of the runway and airport. Landing minimums may be reduced to as low as 0-0 with CAT IIIC. Requires addition of ALSF-II approach lighting system.	$800,000 (does not include required lighting)
Aeronautical Survey Request / complete aeronautical survey to enable development of LPV approach to Runway 5.	Provides survey data for instrument approach procedures.	$50,000
New Procedure Request development of RNAV (GPS) RWY 5 Approach with LPV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost

Overall Recommendations

RUNWAY 23		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions (trees).	Standards.	Varies
Landing Threshold Displace landing threshold approximately 600 feet. Requires relocation of PAPI, glideslope and approach lighting system.	Eliminates fixed obstruction in the 34:1 approach surface, allowing procedures to support lowest practical landing minimums.	$500,000
Weather Reporting Install Runway Visual Range (RVR) equipment.	Replaces prevailing visibility measurement.	$400,000
Runway Lighting Install touchdown zone lights for Runway 23.	Improves visibility of runway environment, allows lower landing visibility minima, maintains landing visibiliity minima below 3/4 statute mile when runway markings are obscured by snow (TERPS 3.1.3).	$800,000
Procedure Review Request Runway 23 centerline lighting be added to AFD and appropriate airport diagrams.	Procedure clarity.	No equipment cost
Aeronautical Survey Request / complete aeronautical survey to enable development of LPV approach to Runway 23.	Provides survey data for instrument approach procedures.	$50,000 (duplicate)
New Procedure Request development of RNAV (GPS) RWY 23 Approach with LPV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost

Overall Recommendations

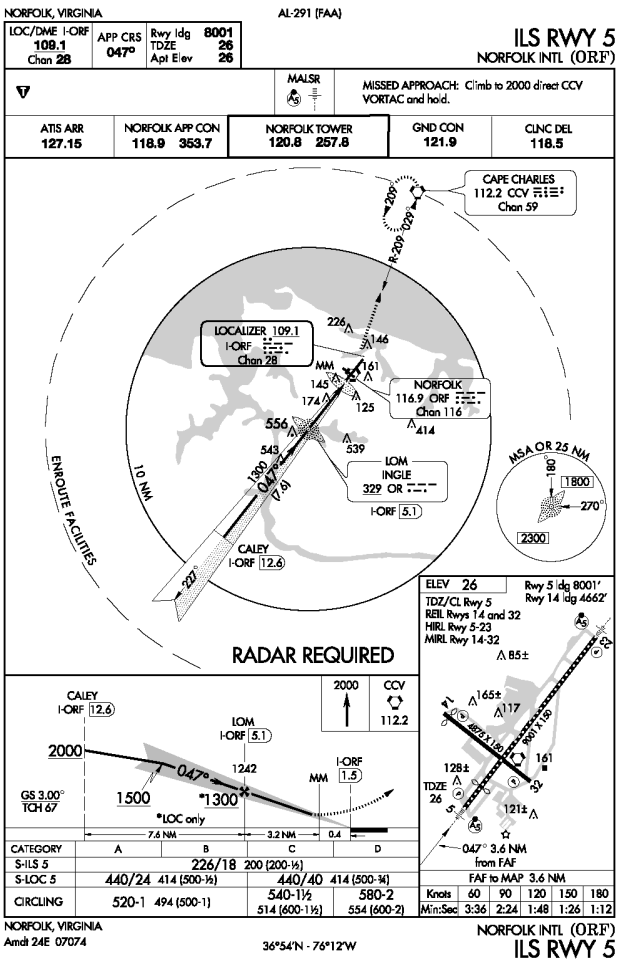
RUNWAY 14		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Aeronautical Survey Request / complete aeronautical survey to enable development of LPV approach to Runway 14.	Provides survey data for instrument approach procedures.	$50,000 (duplicate)
New Procedure Request development of RNAV (GPS) RWY 14 Approach with LPV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost

RUNWAY 32		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions (trees).	Standards.	Varies
Aeronautical Survey Request / complete aeronautical survey to enable development of LPV approach to Runway 32.	Provides survey data for instrument approach procedures.	$50,000 (duplicate)
New Procedure Request development of RNAV (GPS) RWY 32 Approach with LPV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost

Norfolk International (ORF)

Norfolk, Virginia

Procedure Overview



ILS RWY 5 - ILS

FAA PROCEDURE DATA	
Critical Obstacle:	106 **see note 1**
Required Obstacle Clearance:	
Remote Altimeter Adjustment:	
Accuracy Code Adjustment:	
Other Adjustment:	**see note 2**
Rounding Adjustment:	
Minimum Descent Altitude / Decision Height:	226

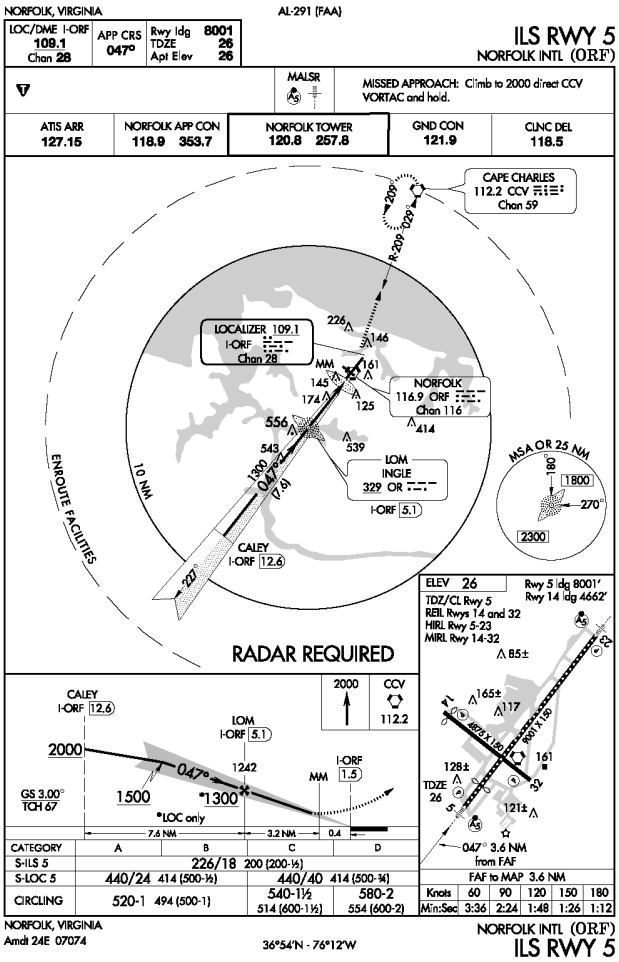
Note 1: BLDG

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1A - PRECISION INSTRUMENT APPROACH REQUIREMENTS		
	<3/4 SM	**KNOWN DEFICIENCIES**
	REQUIRED	
TERPS Paragraph 251	34:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	4,200 ft (Paved)	None
Runway Markings	Precision	None
Holding Position Signs and Markings	Precision	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	MALSR, SSALR, or ALSF	None
Runway Design Standards	<3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 9, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Procedure Overview



ILS RWY 5 - LOC

FAA PROCEDURE DATA		
Critical Obstacle:	169	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:	50	
Other Adjustment:		**see note 2**
Rounding Adjustment:	11	
Minimum Descent Altitude / Decision Height:	480	

Note 1: TWR

Note 2: 8260 does not match plate

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

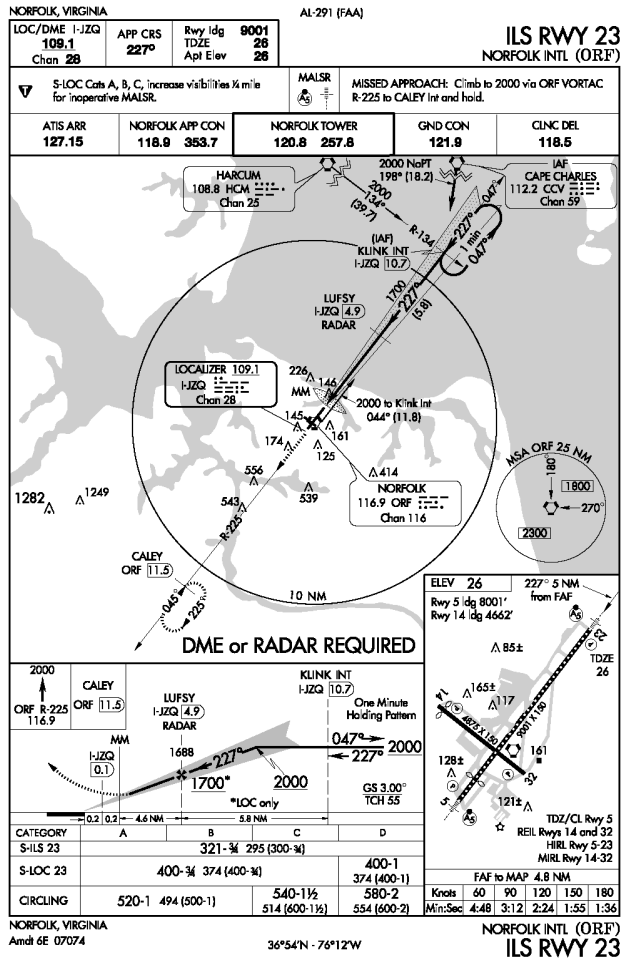
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	<3/4 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	34:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	4,200 ft (Paved)	None
Runway Markings	Precision	None
Holding Position Signs and Markings	Precision	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	MALSR, SSALR, or ALSF Required	None
Runway Design Standards	<3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 9, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Norfolk International (ORF)

Norfolk, Virginia

Procedure Overview



ILS RWY 23 - ILS

FAA PROCEDURE DATA		
Critical Obstacle:	146	**see note 1**
Required Obstacle Clearance:	175	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	0	
Minimum Descent Altitude / Decision Height:	321	

Note 1: TWR (47-0440)

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

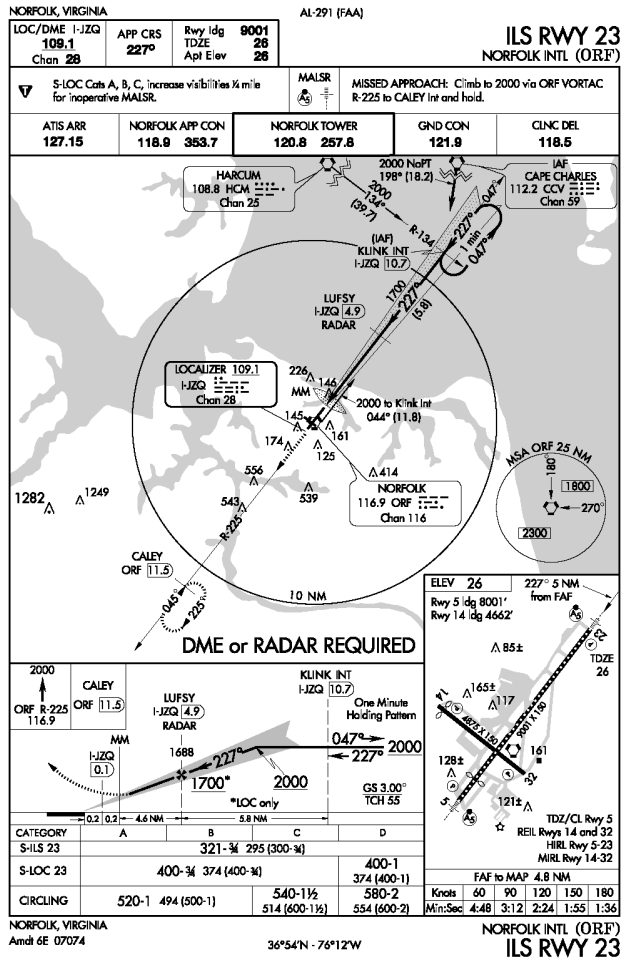
TABLE A16-1A - PRECISION INSTRUMENT APPROACH REQUIREMENTS

	<1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	4,200 ft (Paved)	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	Recommended	None
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 8, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Norfolk International (ORF)

Norfolk, Virginia

Procedure Overview



ILS RWY 23 - LOC

FAA PROCEDURE DATA		
Critical Obstacle:	146	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	4	
Minimum Descent Altitude / Decision Height:	400	

Note 1: TWR (47-0440)

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

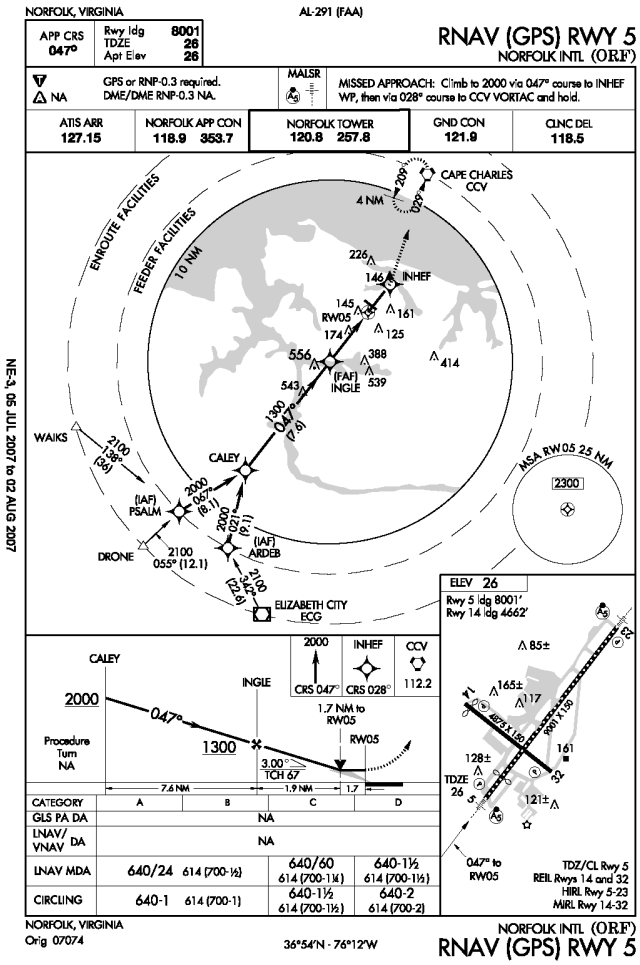
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	<1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft (Paved)	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	Required	None
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 8, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Norfolk International (ORF)

Norfolk, Virginia

Procedure Overview



RNAV (GPS) RWY 5 - LNAV

FAA PROCEDURE DATA		
Critical Obstacle:	388	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:	50	
Other Adjustment:	-52	**see note 2**
Rounding Adjustment:	4	
Minimum Descent Altitude / Decision Height:	640	

Note 1: TWRS (47-0019)

Note 2:

Note 3:

NE-3, 05 JUL 2007 to 02 AUG 2007

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

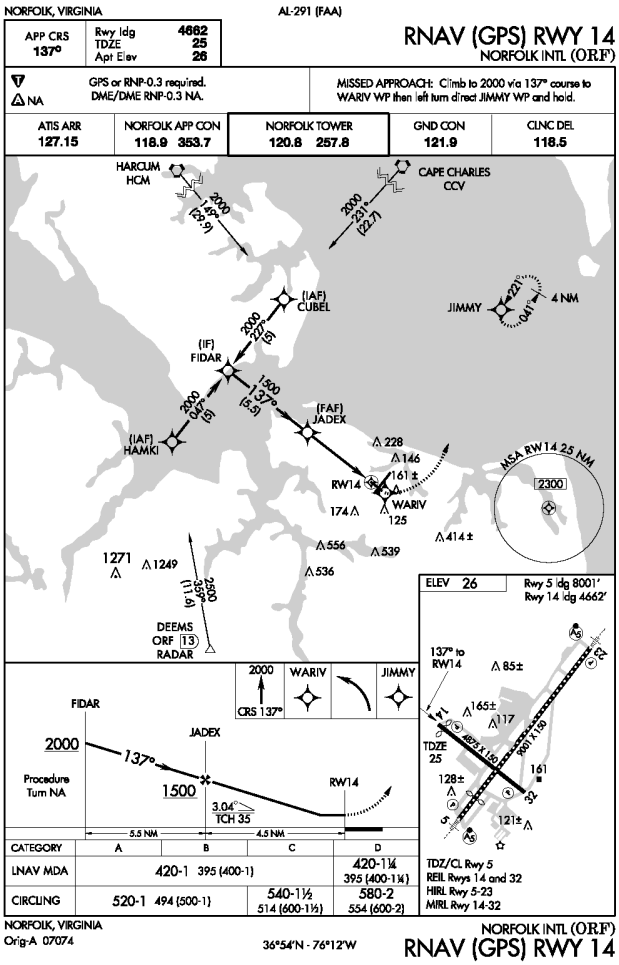
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	<3/4 SM	KNOWN DEFICIENCIES
	REQUIRED	
TERPS Paragraph 251	34:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	4,200 ft (Paved)	None
Runway Markings	Precision	None
Holding Position Signs and Markings	Precision	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	MALSR, SSALR, or ALSF Required	None
Runway Design Standards	<3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 9, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Norfolk International (ORF)

Norfolk, Virginia

Procedure Overview



RNAV (GPS) RWY 14 - LNAV

FAA PROCEDURE DATA		
Critical Obstacle:	120	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:	40	**see note 2**
Rounding Adjustment:	10	
Minimum Descent Altitude / Decision Height:	420	

Note 1: Trees

Note 2: Added to maintain present published mins.

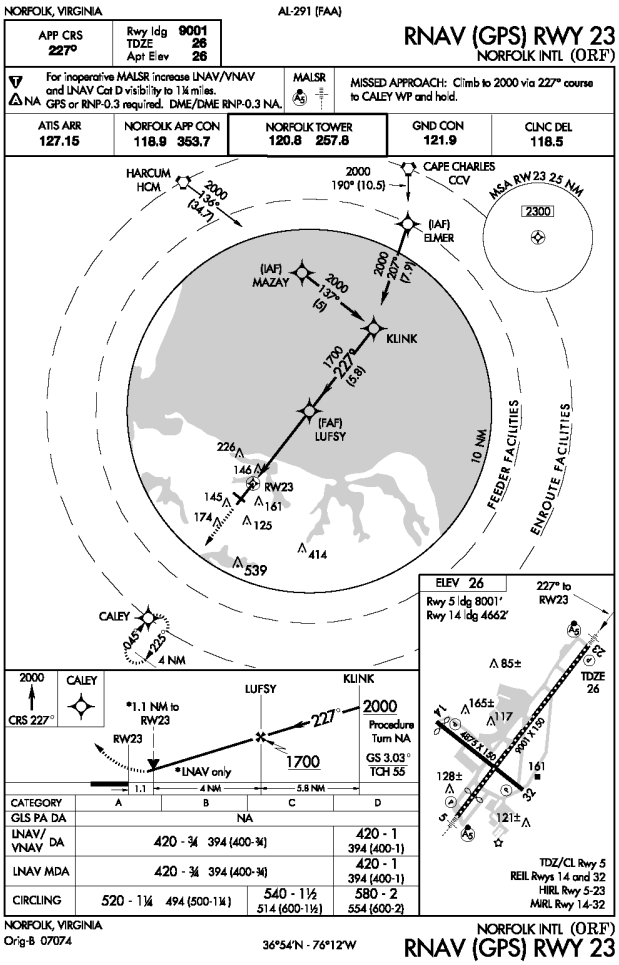
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Norfolk International (ORF)

Norfolk, Virginia

Procedure Overview



RNAV (GPS) RWY 23 - VNAV

FAA PROCEDURE DATA	
Critical Obstacle:	**see note 1**
Required Obstacle Clearance:	
Remote Altimeter Adjustment:	
Accuracy Code Adjustment:	
Other Adjustment:	**see note 2**
Rounding Adjustment:	
Minimum Descent Altitude / Decision Height:	420

Note 1: not shown

Note 2: not shown on provided form 8260

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

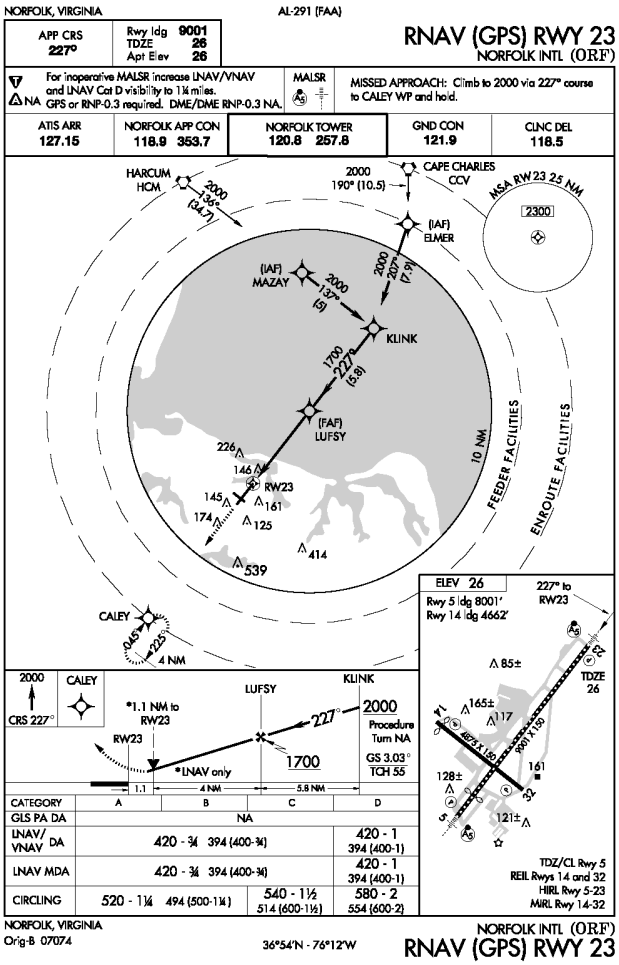
TABLE A16-1B - APPROACH PROCEDURE WITH VERTICAL GUIDANCE APPROACH REQUIREMENTS

	<1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft (Paved)	None
Runway Markings	Nonprecision (precision recommended)	None
Holding Position Signs and Markings	Nonprecision (precision recommended)	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	Required	None
Runway Design Standards	<3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 4 and 9, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Norfolk International (ORF)

Norfolk, Virginia

Procedure Overview



RNAV (GPS) RWY 23 - LNAV

FAA PROCEDURE DATA		
Critical Obstacle:	164	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	6	
Minimum Descent Altitude / Decision Height:	420	

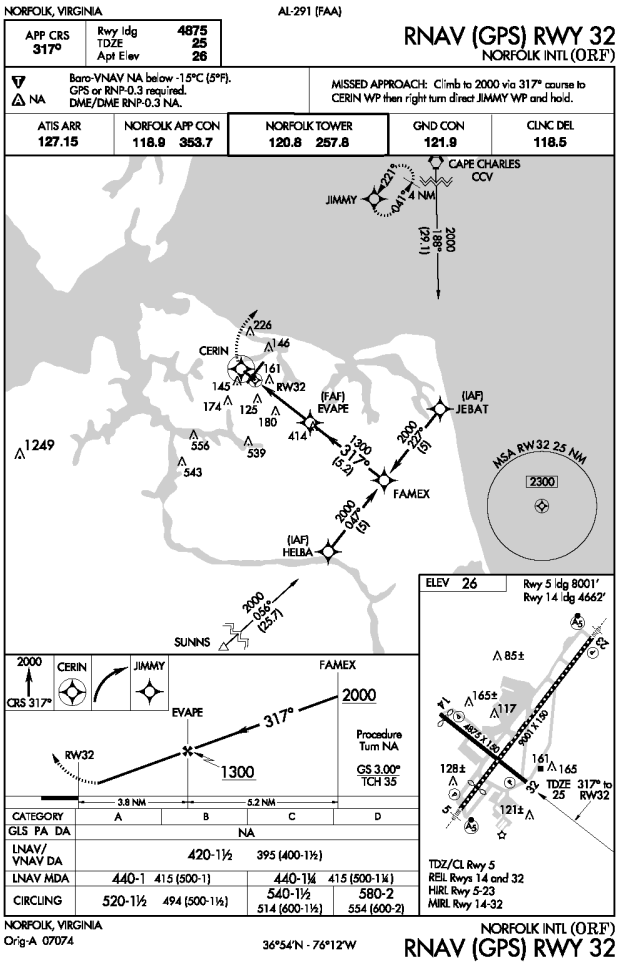
Note 1: TWR (47-0243)

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	<1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft (Paved)	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	Required	None
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 8, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Overview



RNAV (GPS) RWY 32 - VNAV

FAA PROCEDURE DATA		
Critical Obstacle:	165	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	5	
Minimum Descent Altitude / Decision Height:	420	

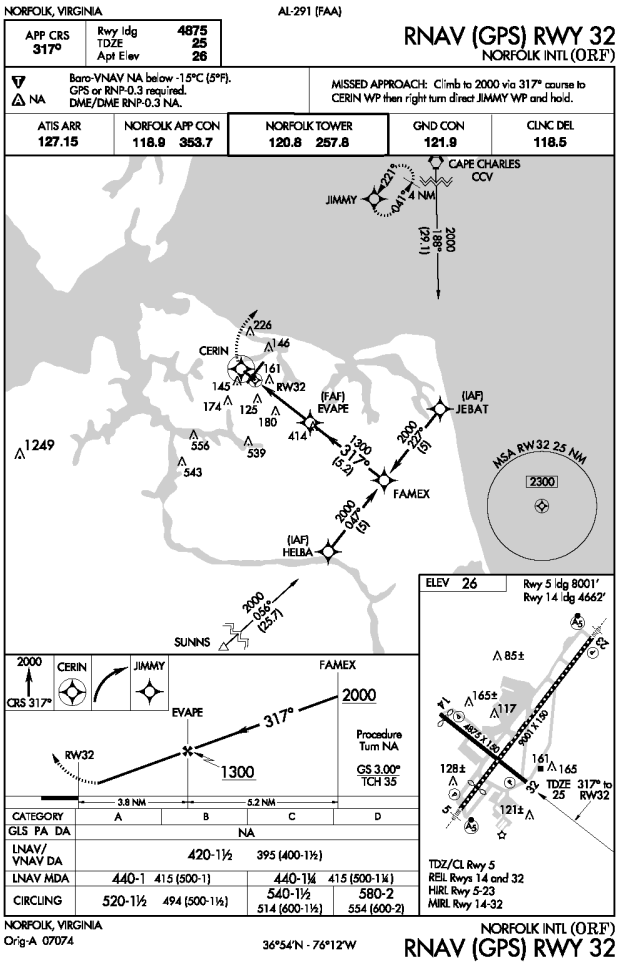
Note 1: ANT (KORF0037)

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1B - APPROACH PROCEDURE WITH VERTICAL GUIDANCE APPROACH REQUIREMENTS		
	>1 SM	**KNOWN DEFICIENCIES**
	REQUIRED	
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 4 and 8, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Procedure Overview



RNAV (GPS) RWY 32 - LNAV

FAA PROCEDURE DATA		
Critical Obstacle:	180	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	10	
Minimum Descent Altitude / Decision Height:	440	

Note 1: TWR (47-1574)

Note 2:

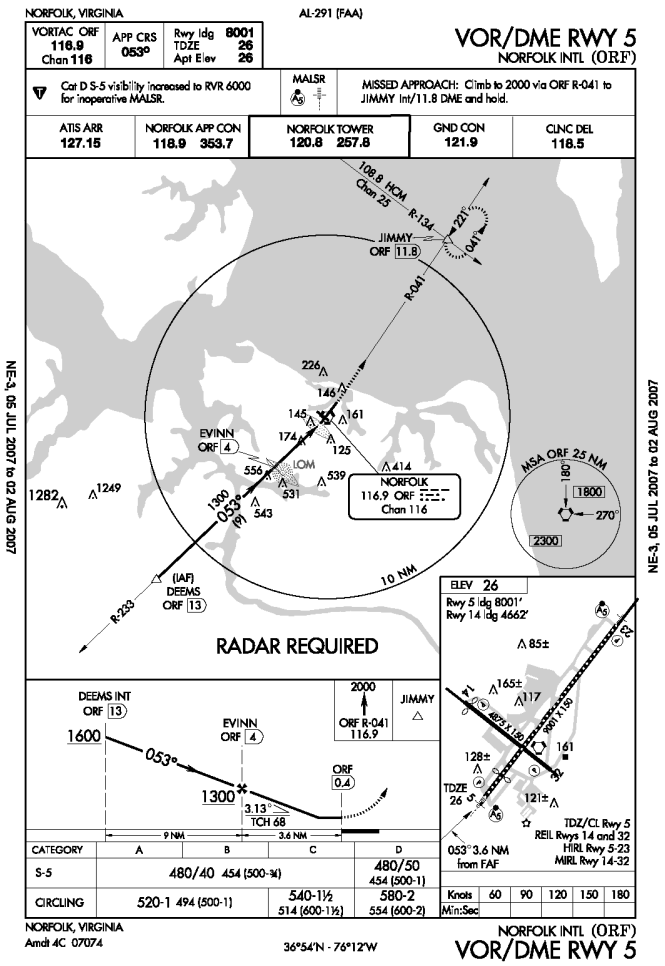
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	1 SM	**KNOWN DEFICIENCIES**
	REQUIRED	
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Norfolk International (ORF)

Norfolk, Virginia

Procedure Overview



VOR/DME RWY 5

FAA PROCEDURE DATA		
Critical Obstacle:	169	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:	50	
Other Adjustment:		**see note 2**
Rounding Adjustment:	11	
Minimum Descent Altitude / Decision Height:	480	

Note 1: Tower (47-0279)

Note 2:

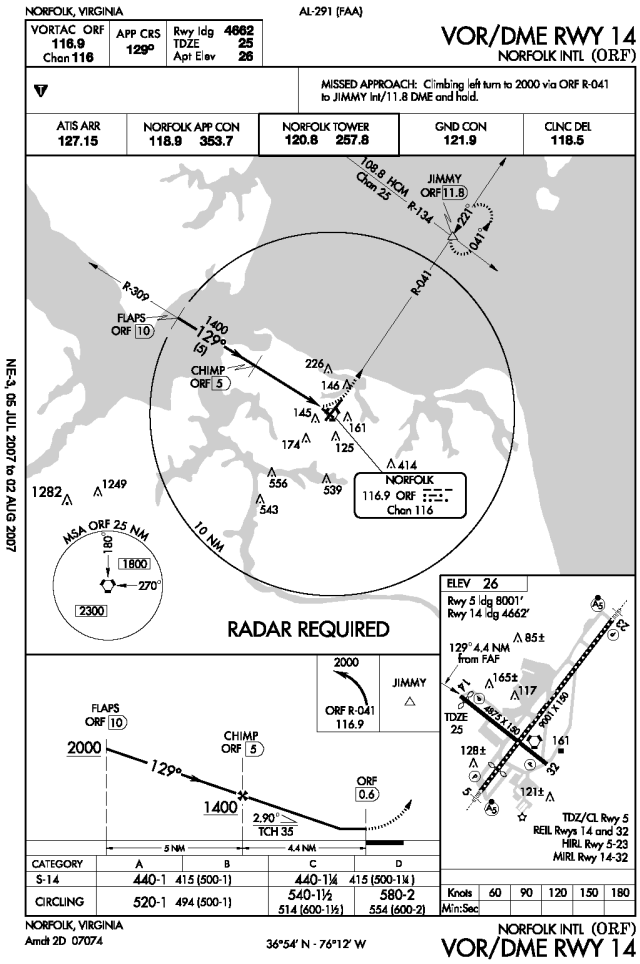
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	<1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft (Paved)	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	Required	None
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 8, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Overview



VOR/DME RWY 14

FAA PROCEDURE DATA		
Critical Obstacle:	184	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	6	
Minimum Descent Altitude / Decision Height:	440	

Note 1: Water Tank (47-10000)

Note 2:

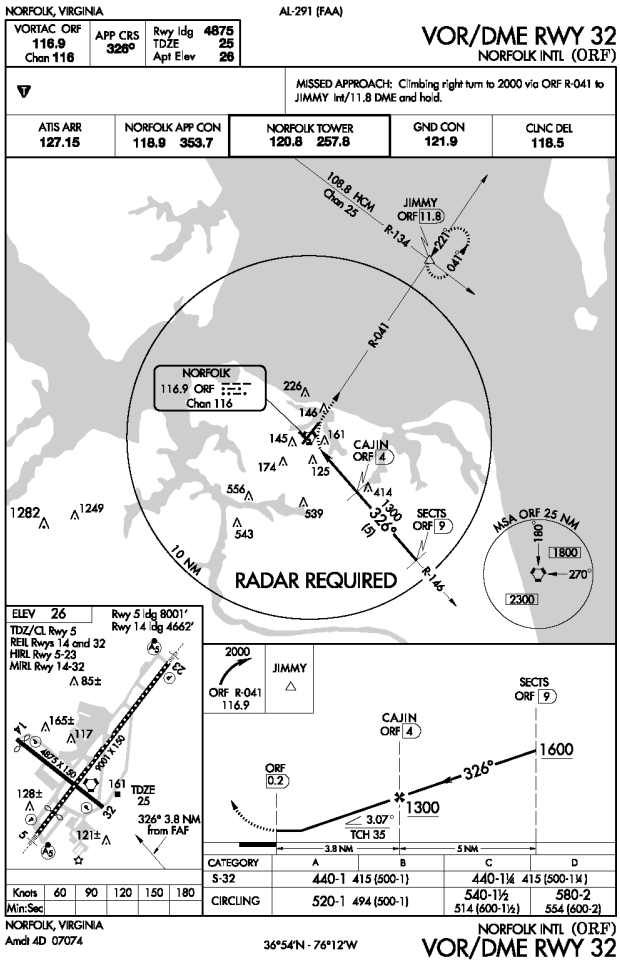
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Overview



VOR/DME RWY 32

FAA PROCEDURE DATA		
Critical Obstacle:	174	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	16	
Minimum Descent Altitude / Decision Height:	440	

Note 1: TWR

Note 2:

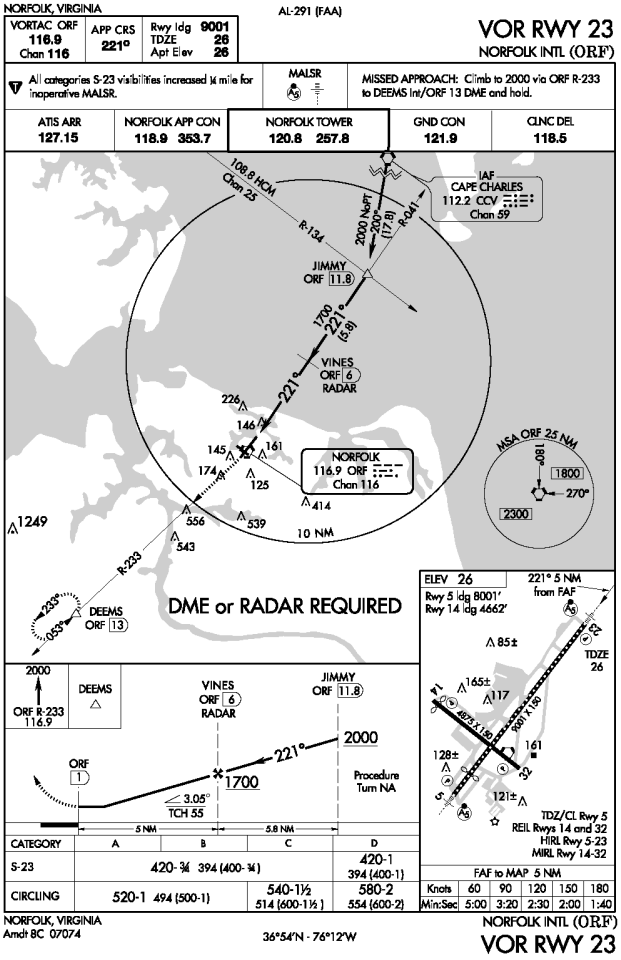
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	1 SM	**KNOWN DEFICIENCIES**
	REQUIRED	
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Norfolk International (ORF)

Norfolk, Virginia

Procedure Overview



VOR RWY 23

FAA PROCEDURE DATA		
Critical Obstacle:	164	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	6	
Minimum Descent Altitude / Decision Height:	420	

Note 1: Tower (47-0243)

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	<1 SM	**KNOWN DEFICIENCIES**
	REQUIRED	
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft (Paved)	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	Required	None
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 8, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Recommendations

RNAV (GPS) RWY 23		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Weather Reporting Install Runway Visual Range (RVR) equipment.	Reduces visibility minimum to as low as 2400 feet RVR.	$400,000 (duplicate)

RNAV (GPS) RWY 32		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a

VOR / DME RWY 5		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a

VOR / DME RWY 14		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a

VOR / DME RWY 32		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a

Procedure Recommendations

VOR RWY 23		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Weather Reporting Install Runway Visual Range (RVR) equipment.	Reduces visibility minimum to as low as 2400 feet RVR.	$400,000 (duplicate)

ILS RWY 5		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
New Procedure Request development of ILS RWY 5 (CAT II) and ILS RWY 5 (CAT III) approaches.	Improve all-weather capability of the runway and airport. Lower landing minimum to as low as 0-0 with CAT IIIC.	$800,000 (duplicate; does not include required lighting)
Approach Lighting System Upgrade MALSR to ALSF-II for Runway 5. See Overall Recommendations.	Required component for CAT II ILS.	$5,000,000 (duplicate)

Procedure Recommendations

ILS RWY 23		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Landing Threshold Displace landing threshold approximately 600 feet. Requires relocation of PAPI, glideslope and approach lighting system.	Eliminates fixed obstruction in the 34:1 approach surface, allowing procedures to support lowest practical landing minimums.	$500,000 (duplicate)
Runway Lighting Install touchdown zone lights for Runway 23.	Improves visibility of runway environment, allows lower landing visibility minima, maintains landing visibiliity minima below 3/4 statute mile when runway markings are obscured by snow (TERPS 3.1.3).	$800,000 (duplicate)
Weather Reporting Install Runway Visual Range (RVR) equipment.	Reduces visibility minimum to as low as 2400 feet RVR.	$400,000 (duplicate)
Visibility Minimum Upon installation of runway visual range equipment, request procedure be updated to 1800 RVR.	Lowers landing visibility minimum.	$0

RNAV (GPS) RWY 5		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Critical Obstacle Field verify critical obstacle to change accuracy code from "D" to "A" or 50 feet to 3 feet.	Minimum Descent Altitude (MDA) may be reduced by 40 to 60 feet.	Less than $10,000

Procedure Recommendations

RNAV (GPS) RWY 14		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a

Orange County (OMH)

Orange, Virginia

AIRPORT INFORMATION	
ROLE / CLASSIFICATION INFORMATION	
VATSP Classfication (2008):	General Aviation Community
NPIAS Role (2008):	General Aviation
Study Classification:	General Aviation Community

ACTIVITY INFORMATION	
Based Aircraft (2007):	40
Annual Operations (2020):	9171
Annual Enplanements (2020):	n/a
DEVELOPMENT INFORMATION (2008)	
Critical Airport Reference Code (Existing):	B-I (small)
Critical Airport Reference Code (Proposed):	B-II (small)
Airport Layout Plan (Original):	August, 2006
Airport Layout Plan (Revision):	n/a

Proposed Development (from ALD):
- Upgrade RWY 26 to non-precision

AERONAUTICAL SURVEY INFORMATION

Runway End	Survey Type	Survey Date
all	Photoslope	2006
8	ANA-LPV	underway

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS

Available Weather Reporting:	AWOS-III
Common Traffic Advisory Frequency:	122.8
Clearance Delivery:	Phone

Nearby Navigational Aids:

NAILR	NDB	351	MSQ	218°/ 14.1 NM TO FIELD
GORDONSVILLE	VORTAC	115.6	GVE	026°/ 14.9 NM TO FIELD
CASANOVA	VORTAC	116.3	CSN	206°/ 25.1 NM TO FIELD

Orange County (OMH)

Orange, Virginia

Instrument Approach Procedure Summary

Minimums listed are Category B

EXISTING PROCEDURES		
CIRCLING		
VOR/DME OR GPS-A	2000 - 3 (1546)	Amdt 2A
RUNWAY 8		
GPS RWY 8	1120 - 1 (674)	Orig A

PROCEDURES PROPOSED AS PART OF STUDY
RNAV (GPS) RWY 26 - LNAV
RNAV (GPS) RWY 26 - LPV
RNAV (GPS) RWY 8 - LPV

VISIBILITY CHANGES PROPOSED AS PART OF STUDY	
none	

REVIEWER COMMENTS

A new approach to Runway 26 would eliminate the requirement for circle-to-land operations when the wind and weather conditions favor landing to the west. The Airport Sponsor completed the requested informational survey.

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 8 26 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	B-I (small)	B-II (small)
Runway Dimensions (Length x Width in ft):	3200 x 75	3200 x 75
Runway to Taxiway Separation (feet):	240	240
Runway Lighting:	MIRL	MIRL
RUNWAY 8		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 700 x 1000	500 x 700 x 1000
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	PAPI; REILs	PAPI; REILs
RUNWAY 26		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 700 x 1000	500 x 700 x 1000
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	PAPI; REILs	PAPI; REILs

Orange County (OMH)

Orange, Virginia

System Benchmarks

General Aviation Community			
Best Approach (Primary Runway End)			
BENCHMARK		**RUNWAY 8**	
Approach:	Ground-based	☑ meets	VOR/DME OR GPS-A
Ceiling:	500 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Approach:	LNAV	☐ meets	GPS RWY 8
Ceiling:	400 AGL	☐ meets	
Visibility:	1 statute mile	☑ meets	
Equipment:	REILs, MIRLs, PAPI	☑ meets	
Secondary Approach (Different Runway End)			
BENCHMARK		**RUNWAY 26**	
Approach:		☐ meets	n/a (no ground-based approach available)
Ceiling:		☐ meets	
Visibility:		☐ meets	
Approach:	LNAV	☐ meets	n/a (no satellite-based approach available)
Ceiling:	500 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Equipment:	REILs, MIRLs, PAPI	☑ meets	

Additional Requirements			
Weather:	Normally on-field, 24/7, data-linked	☑ meets	
Access to ATC Clearance:	RTR or GCO	☐ meets	
ADS-B Coverage:	1000 AGL	☐ meets	

Overall Recommendations

GENERAL		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Weather Reporting Upgrade existing AWOS-III to include present weather, lightning and freezing rain sensor.	Improves information available to pilot.	$60,000
Communications Install a Ground Communication Outlet (GCO) directly with Potomac Approach.	Provides direct communication with approach control via radio and an "on-demand" telephone land line link. Used by aircraft on ground for obtaining or canceling IFR clearances.	$20,000
Communications Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	Improves pilot/controller communications and clearance delivery process.	Less than $5,000
Data link Provide ADS-B coverage at 1000 AGL or lower.	Provides traffic surveillance, terrain avoidance, weather data, etc. Crucial component for Next Generation Air Transportation System.	Unknown

RUNWAY 8 26		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Airfield Lighting Control Change control sequence and/or facility directory note for MIRLs to be preset on low intensity with higher intensity activated on CTAF.	Provides visibilty of landing environment during night and adverse weather conditions even during times of aircraft equipment failure or pilot control system malfunction.	Less than $10,000

Overall Recommendations

RUNWAY 8		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions (tree).	Standards.	Varies
Precision Approach Path Indicator Implement standard glidepath angle (3.0 degrees) with removal of obstructions.	Provides standardized approach path.	No equipment cost
Precision Approach Path Indicator Upgrade Runway 8 PAPI from a 2 box to a 4 box unit.	Provides improved visual vertical descent guidance information during the approach to the runway.	$20,000
Aeronautical Survey Request / complete aeronautical survey to enable development of LPV approach to Runway 8.	Provides survey data for instrument approach procedures.	$50,000
New Procedure Request development of RNAV (GPS) RWY 8 Approach with LPV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost

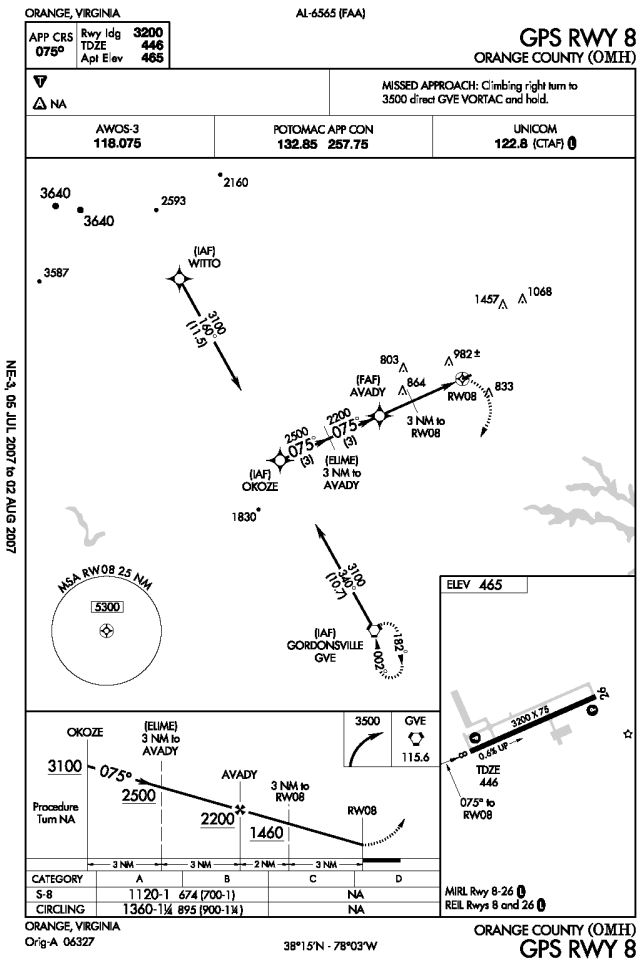
Overall Recommendations

RUNWAY 26		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions (tree).	Standards.	Varies
Precision Approach Path Indicator Implement standard glidepath angle (3.0 degrees) with removal of obstructions.	Provides standardized approach path.	No equipment cost
Precision Approach Path Indicator Upgrade Runway 26 PAPI from a 2 box to a 4 box unit.	Provides improved visual vertical descent guidance information during the approach to the runway.	$20,000
Aeronautical Survey Request / complete aeronautical survey to enable development of LNAV and LPV approaches to Runway 26.	Provides survey data for instrument approach procedures.	$50,000 (duplicate)
New Procedure Request development of RNAV (GPS) RWY 26 Approach with LPV and LNAV landing minimums.	Improve all-weather capability of the runway and airport and eliminate requirement for circle-to-land operations. LNAV may reduce the MDA to as low as 880-1 (415) or an improvement of 480 feet.	No equipment cost

Orange County (OMH)

Orange, Virginia

Procedure Overview



GPS RWY 8

FAA PROCEDURE DATA		
Critical Obstacle:	982	see note 1
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:	72	
Accuracy Code Adjustment:		
Other Adjustment:	-195	see note 2
Rounding Adjustment:	11	
Minimum Descent Altitude / Decision Height:	1120	

Note 1: Trees

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

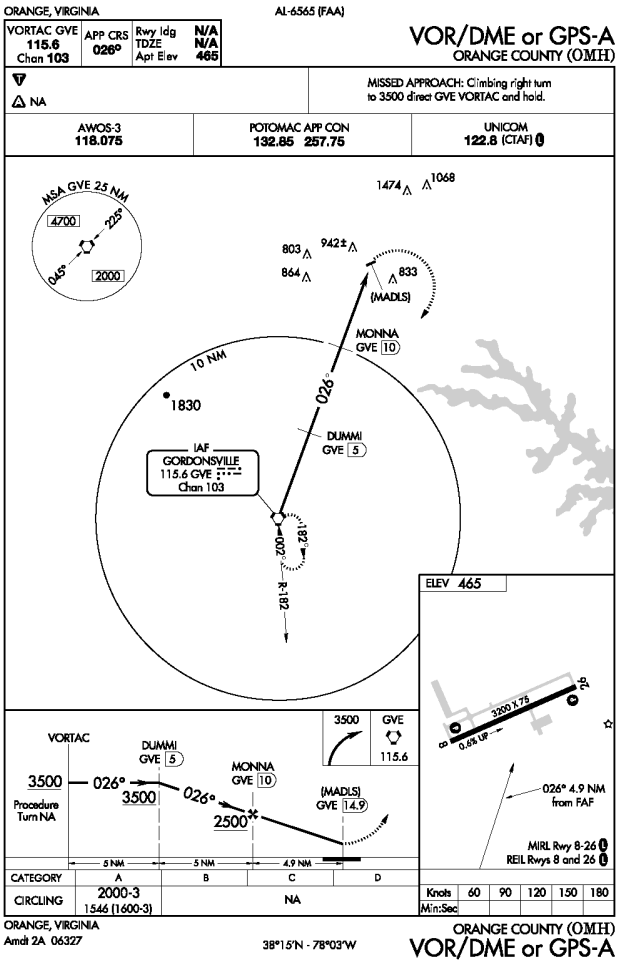
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Orange County (OMH)

Orange, Virginia

Procedure Overview



VOR/DME OR GPS-A

FAA PROCEDURE DATA		
Critical Obstacle:	942	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:	80	
Accuracy Code Adjustment:		
Other Adjustment:	723	**see note 2**
Rounding Adjustment:	5	
Minimum Descent Altitude / Decision Height:	2000	

Note 1: Trs

Note 2: GVE VORTAC flight check unsatisfactory below 2000 MSL

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	CIRCLING	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Recommended	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Visual (Basic)	None
Holding Position Signs and Markings	Visual (Basic)	None
Runway Edge Lights	MIRL / LIRL (for night minima only)	None
Parallel Taxiway	Recommended	None
Approach Lights	Not Required	Yes
Runway Design Standards	Not Required	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-2, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Recommendations

GPS RWY 8		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Procedure Review Request procedure title be updated to RNAV (GPS) RWY 8 format.	Procedure clarity.	No equipment cost
Procedure Review Request FAA re-evaluate remote altimeter setting source (RASS) adjustment of 72 feet.	Improves landing minimums by 60 to 80 feet.	No equipment cost

VOR / DME OR GPS A		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Procedure Review Cancel GPS overlay procedure when RNAV (GPS) RWY 26 procedure is published.		No equipment cost
VORTAC Upgrade Gordonsville VORTAC to improve signal quality.	Eliminate flight check restriction and may reduce Minimum Descent Altitude (MDA).	No equipment cost

Richmond International (RIC)

Richmond, Virginia

AIRPORT INFORMATION

ROLE / CLASSIFICATION INFORMATION

VATSP Classfication (2008):	Commercial Service
NPIAS Role (2008):	Primary, Small Hub
Study Classification:	Commercial Service (>= 1 million enplanements)

ACTIVITY INFORMATION

Based Aircraft (2007):	75
Annual Operations (2020):	214391
Annual Enplanements (2020):	3062572

DEVELOPMENT INFORMATION (2008)

Critical Airport Reference Code (Existing):	D-IV
Critical Airport Reference Code (Proposed):	D-V
Airport Layout Plan (Original):	September, 1998
Airport Layout Plan (Revision):	August, 2002

Proposed Development (from ALD):

- Extend RWY 16L (500')
- Extend RWY 34R (1200')
- Parallel Rwy 16R-34L
- Upgrade 16L-34R to D-V

AERONAUTICAL SURVEY INFORMATION

Runway End	Survey Type	Survey Date
all	Photoslope	2001
all	OC-RIC 347	2000
34	PIR	2000
16	PIR	2000
25	C	2000
7	BV	2000
20	C	2000

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS

Available Weather Reporting:	ASOS
Common Traffic Advisory Frequency:	121.1
Clearance Delivery:	Direct

Nearby Navigational Aids:

RICHMOND	VORTAC	114.1	RIC	AT FIELD
HOPEWELL	VORTAC	112	HPW	323°/ 14.4 NM TO FIELD
HARCUM	VORTAC	108.8	HCM	284°/ 29.2 NM TO FIELD
FLAT ROCK	VORTAC	113.3	FAK	099°/ 24.4 NM TO FIELD

Richmond International (RIC)

Richmond, Virginia

Instrument Approach Procedure Summary

Minimums listed are Category B

EXISTING PROCEDURES		
RUNWAY 16		
ILS RWY 16 - ILS	367 - 2400 (200)	Amdt 8
ILS RWY 16 - LOC	580 - 2400 (413)	Amdt 8
RNAV (GPS) RWY 16 - LNAV	800 - 2400 (413)	Orig
RNAV (GPS) RWY 16 - VNAV	580 - 5000 (413)	Orig
VOR RWY 16	640 - 2400 (473)	Amdt 27A
RUNWAY 2		
ILS RWY 2 - ILS	411 - 3/4 (250)	Amdt 1
ILS RWY 2 - LOC	580 - 3/4 (419)	Amdt 1
RNAV (GPS) RWY 2 - LNAV	580 - 3/4 (419)	Orig
RNAV (GPS) RWY 2 - VNAV	520 - 3/4 (359)	Orig
VOR RWY 2	540 - 1 (379)	Amdt 5C
RUNWAY 20		
RNAV (GPS) RWY 20 - LNAV	600 - 1 (433)	Orig
VOR RWY 20	640 - 1 (473)	Amdt 1A
RUNWAY 25		
RNAV (GPS) RWY 25 - LNAV	600 - 1 (440)	Orig
RNAV (GPS) RWY 25 - VNAV	560 - 1 1/2 (400)	Orig
VOR RWY 25	600 - 1 (440)	Amdt 16A
RUNWAY 34		
ILS OR LOC RWY 34 - ILS	362 - 1800 (200)	Amdt 13B
ILS OR LOC RWY 34 - LOC	520 - 2400 (358)	Amdt 13B
ILS RWY 34 (CAT II)	262 - 1200 (100)	Amdt 13B
ILS RWY 34 (CAT III)	0 - 600 (0)	Amdt 13B
RNAV (GPS) RWY 34 - LNAV	500 - 2400 (339)	Orig A
RNAV (GPS) RWY 34 - VNAV	500 - 4000 (339)	Orig A
VOR RWY 34	540 - 2400 (379)	Amdt 23A
RUNWAY 7		
RNAV (GPS) RWY 7 - LNAV	540 - 1 (382)	Orig

PROCEDURES PROPOSED AS PART OF STUDY
LOC RWY 20
RNAV (GPS) RWY 16 - LPV
RNAV (GPS) RWY 2 - LPV
RNAV (GPS) RWY 20 - LPV
RNAV (GPS) RWY 34 - LPV

VISIBILITY CHANGES PROPOSED AS PART OF STUDY	
RUNWAY 2:	3/4 SM to 2400 RVR
RUNWAY 20:	1 SM to 1/2 SM

RUNWAY 20:	1 SM to 1/2 SM
RUNWAY 16:	2400 RVR to 1800 RVR

REVIEWER COMMENTS

Vertically-guided (LPV) satellite-based approaches are recommended for each runway end. The Study recommends a reduction in landing visibility minimums. Additional information regarding the estimated impacts and costs associated with the visibility changes is included in Appendix E.

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 16L 34R INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	D-IV	D-V
Runway Dimensions (Length x Width in ft):	9003 x 150	10203/10703 x 150
Runway to Taxiway Separation (feet):	800	600
Runway Lighting:	HIRL	HIRL
RUNWAY 16L		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	1000 x 1750 x 2500	1000 x 1750 x 2500
Runway Markings:	Precision	Precision
Available Visual Approach Aids:	VASI; CL; MALSR	PAPI; CL; MALSR
RUNWAY 34R		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	1000 x 1750 x 2500	1000 x 1750 x 2500
Runway Markings:	Precision	Precision
Available Visual Approach Aids:	CL; TDZ; ALSF-II	PAPI; CL; TDZ; ALSF-II
RUNWAY 16R 34L INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):		D-V
Runway Dimensions (Length x Width in ft):		8000 x 150
Runway to Taxiway Separation (feet):		600
Runway Lighting:		HIRL
RUNWAY 16R		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	n/a	1000 x 1750 x 2500
Runway Markings:	n/a	Precision
Available Visual Approach Aids:	n/a	PAPI; CL; TDZ; ALSF-II
RUNWAY 34L		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	n/a	1000 x 1750 x 2500
Runway Markings:	n/a	Precision
Available Visual Approach Aids:	n/a	PAPI; CL; TDZ; MALSR
RUNWAY 2 20 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	D-IV	D-IV
Runway Dimensions (Length x Width in ft):	6607 x 150	6607 x 150
Runway to Taxiway Separation (feet):	400	400
Runway Lighting:	HIRL	HIRL

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 2		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	1000 x 1510 x 1700	1000 x 1510 x 1700
Runway Markings:	Precision	Precision
Available Visual Approach Aids:	VASI; MALSR	PAPI; MALSR
RUNWAY 20		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 1010 x 1700	500 x 1010 x 1700
Runway Markings:	Precision	Precision
Available Visual Approach Aids:	VASI; REIL	PAPI; REIL
RUNWAY 7 25 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	D-III	B-III/closed
Runway Dimensions (Length x Width in ft):	5326 x 100	closed
Runway to Taxiway Separation (feet):	n/a	closed
Runway Lighting:	HIRL	closed
RUNWAY 7		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 1010 x 1700	closed
Runway Markings:	Non-Precision	closed
Available Visual Approach Aids:	none	closed
RUNWAY 25		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 1010 x 1700	closed
Runway Markings:	Non-Precision	closed
Available Visual Approach Aids:	V4L; REILs	closed

Richmond International (RIC)

Richmond, Virginia

System Benchmarks

Commercial Service (> 1 million enplanements)			
Best Approach (Primary Runway End)			
BENCHMARK		**RUNWAY 34**	
Approach:	ILS CAT III	☑ meets	ILS RWY 34 (CAT III)
Ceiling:	100 AGL	☑ meets	
Visibility:	1200 RVR	☑ meets	
Approach:	LPV	☐ meets	RNAV (GPS) RWY 34 - LNAV
Ceiling:	200 AGL	☐ meets	
Visibility:	1800 RVR	☐ meets	
Equipment:	ALSF-2, TDZ, CL, HIRLs, RVR, PAPI	☐ meets	existing ALSF-2, TDZ, CL, HIRLs, RVR
Secondary Approach (Different Runway End)			
BENCHMARK		**RUNWAY 16**	
Approach:	ILS CAT I	☑ meets	ILS RWY 16 - ILS
Ceiling:	200 AGL	☑ meets	
Visibility:	1800 RVR	☐ meets	
Approach:	LPV	☐ meets	RNAV (GPS) RWY 16 - LNAV
Ceiling:	200 AGL	☐ meets	
Visibility:	1800 RVR	☐ meets	
Equipment:	ALSF-2 or MALSR, TDZ, CL, HIRLs, RVR, PAPI	☐ meets	existing MALSR, CL, HIRLs, RVR, VASI
All Ends of Instrument Runways			
BENCHMARK		**RUNWAY 2**	
Approach:	Ground-based	☑ meets	ILS RWY 2 - ILS
Ceiling:	400 AGL	☑ meets	
Visibility:	1 statute mile	☑ meets	
Approach:	LPV	☐ meets	RNAV (GPS) RWY 2 - VNAV
Ceiling:	400 AGL	☑ meets	
Visibility:	1 statute mile	☑ meets	
Equipment:	REILs, HIRLs, PAPI	☐ meets	existing HIRLs, VASI, MALSR

Richmond International (RIC)

Richmond, Virginia

BENCHMARK		RUNWAY 20	
Approach:	Ground-based	☑ meets	VOR RWY 20
Ceiling:	400 AGL	☐ meets	
Visibility:	1 statute mile	☑ meets	
Approach:	LPV	☐ meets	RNAV (GPS) RWY 20 - LNAV
Ceiling:	400 AGL	☐ meets	
Visibility:	1 statute mile	☑ meets	
Equipment:	REILs, HIRLs, PAPI	☐ meets	existing REILs, HIRLs

BENCHMARK		RUNWAY 25	
Approach:	Ground-based	☑ meets	VOR RWY 25
Ceiling:	400 AGL	☐ meets	
Visibility:	1 statute mile	☑ meets	
Approach:	LPV	☐ meets	RNAV (GPS) RWY 25 - VNAV
Ceiling:	400 AGL	☑ meets	
Visibility:	1 statute mile	☐ meets	
Equipment:	REILs, HIRLs, PAPI	☐ meets	existing REILs, HIRLs, VASI

BENCHMARK		RUNWAY 7	
Approach:	Ground-based	☐ meets	n/a (no ground-based approach available)
Ceiling:	400 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Approach:	LPV	☐ meets	RNAV (GPS) RWY 7 - LNAV
Ceiling:	400 AGL	☑ meets	
Visibility:	1 statute mile	☑ meets	
Equipment:	REILs, HIRLs, PAPI	☐ meets	existing HIRLs

Weather:	on-field, 24/7, data-linked	☑ meets	
Access to ATC Clearance:	Direct	☑ meets	
ADS-B Coverage:	On ground	☐ meets	

Overall Recommendations

GENERAL		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Data link Provide ADS-B coverage while on the ground.	Provides traffic surveillance, terrain avoidance, weather data, etc. Crucial component for Next Generation Air Transportation System.	$100,000
Local Area Augmentation System (LAAS) Provide LAAS coverage to augment existing global positioning system.	Provides enhanced signal accuracy.	Unknown

RUNWAY 2		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove or lower close-in obstruction (light pole).	Standards.	$20,000
Runway End Identifier Lights Confirm presence of REILs and MALSR; remove REILs.	FAA standards allow for removal of REILs when approach lighting system present.	$10,000
Precision Approach Path Indicator Upgrade Runway 2 VASI to a 4-box PAPI.	Provides improved visual vertical descent guidance information during the approach to the runway.	$200,000
Weather Reporting Install Runway Visual Range (RVR) equipment.	Replaces prevailing visibility measurement.	$400,000
Aeronautical Survey Request / update aeronautical survey to enable development of LPV approach to Runway 2.	Provides survey data for instrument approach procedures.	$50,000
New Procedure Request development of RNAV (GPS) RWY 2 Approach with LPV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost

Overall Recommendations

RUNWAY 20		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Precision Approach Path Indicator Upgrade Runway 20 VASI to a 4-box PAPI.	Provides improved visual vertical descent guidance information during the approach to the runway.	$200,000
Visibility Minimum Upon installation of approach lighting system and subsequent acceptance of visibility credit, different design standards apply (less than 1 mile).	Lowers landing visibility minimum.	$500,000
Approach Lighting System Install MALSR for Runway 20.	Improves pilot's ability to detect the landing environment.	$1,250,000
Aeronautical Survey Request / complete aeronautical survey to enable development of LPV approach to Runway 20.	Provides survey data for instrument approach procedures.	$50,000 (duplicate)
New Procedure Request development of RNAV (GPS) RWY 20 Approach with LPV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost

RUNWAY 7		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Precision Approach Path Indicator Install 4-box PAPI for Runway 7.	Provides visual vertical descent guidance information during the approach to the runway.	$200,000

RUNWAY 25		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Precision Approach Path Indicator Install 4-box PAPI for Runway 25.	Provides visual vertical descent guidance information during the approach to the runway.	$200,000

Overall Recommendations

RUNWAY 16		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Precision Approach Path Indicator Upgrade Runway 16 VASI to a 4-box PAPI.	Provides improved visual vertical descent guidance information during the approach to the runway.	$200,000
Visibility Minimum Upon installation of touchdown zone lights, request visibility minimum be lowered from 2400 RVR to 1800 RVR.	Lowers landing visibility minimum.	$0
Runway Lighting Install touchdown zone lights for Runway 16.	Improves visibility of runway environment, allows lower landing visibility minima, maintains landing visibiliity minima below 3/4 statute mile when runway markings are obscured by snow (TERPS 3.1.3).	$800,000
Aeronautical Survey Request / update aeronautical survey to enable development of LPV approach to Runway 16.	Provides survey data for instrument approach procedures.	$50,000 (duplicate)
New Procedure Request development of RNAV (GPS) RWY 16 Approach with LPV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost

RUNWAY 34		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Precision Approach Path Indicator Install 4-box PAPI for Runway 34.	Provides visual vertical descent guidance information during the approach to the runway.	$200,000
Aeronautical Survey Request / update aeronautical survey to enable development of LPV approach to Runway 34.	Provides survey data for instrument approach procedures.	$50,000 (duplicate)
New Procedure Request development of RNAV (GPS) RWY 34 Approach with LPV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost

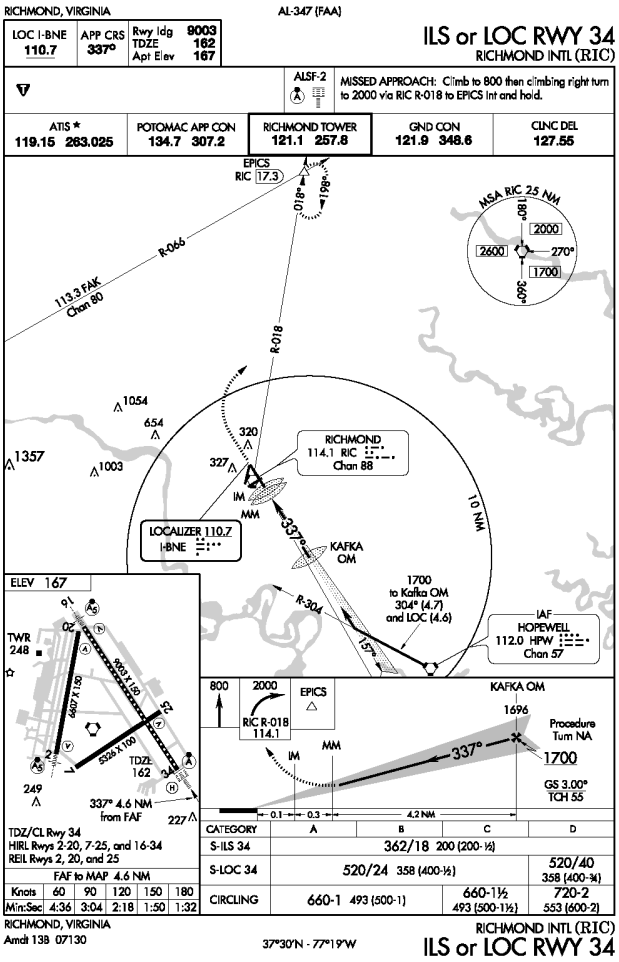
Overall Recommendations

ILS RWY 2		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Weather Reporting Install Runway Visual Range (RVR) equipment.	Replaces prevailing visibility measurement.	$400,000 (duplicate)
Visibility Minimum Upon installation of runway visual range equipment, request procedure be updated to 2400 RVR.	Lowers landing visibility minimum.	$0

Richmond International (RIC)

Richmond, Virginia

Procedure Overview



ILS OR LOC RWY 34 - ILS

FAA PROCEDURE DATA	
Critical Obstacle:	232 **see note 1**
Required Obstacle Clearance:	
Remote Altimeter Adjustment:	
Accuracy Code Adjustment:	
Other Adjustment:	**see note 2**
Rounding Adjustment:	
Minimum Descent Altitude / Decision Height:	362

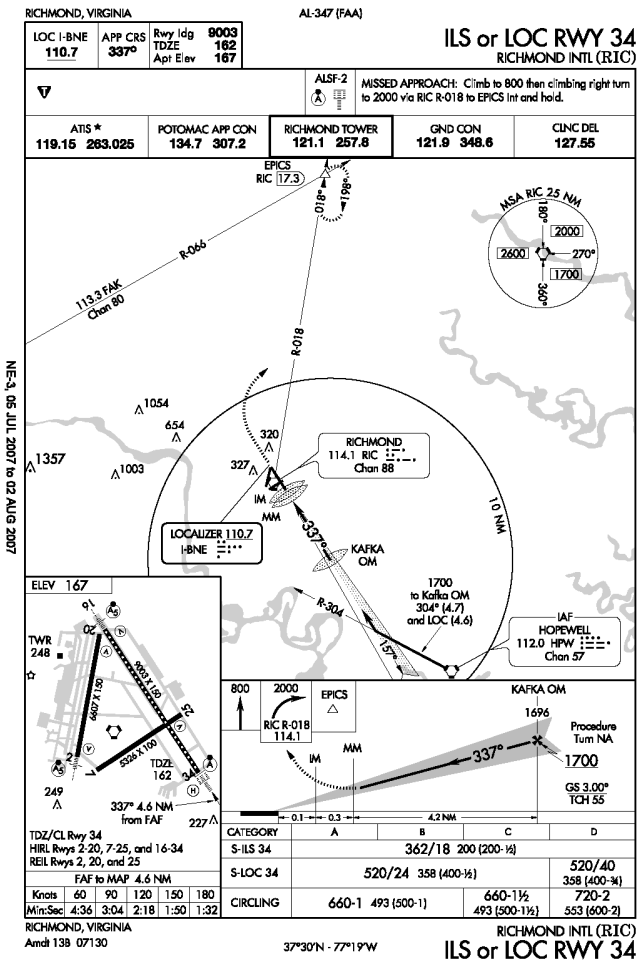
Note 1: Trees (KRIC0058)

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1A - PRECISION INSTRUMENT APPROACH REQUIREMENTS		
	<3/4 SM	**KNOWN DEFICIENCIES**
	REQUIRED	
TERPS Paragraph 251	34:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	4,200 ft (Paved)	None
Runway Markings	Precision	None
Holding Position Signs and Markings	Precision	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	MALSR, SSALR, or ALSF	None
Runway Design Standards	<3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 9, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Procedure Overview



ILS OR LOC RWY 34 - LOC

FAA PROCEDURE DATA		
Critical Obstacle:	259	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	11	
Minimum Descent Altitude / Decision Height:	520	

Note 1: Trees

Note 2:

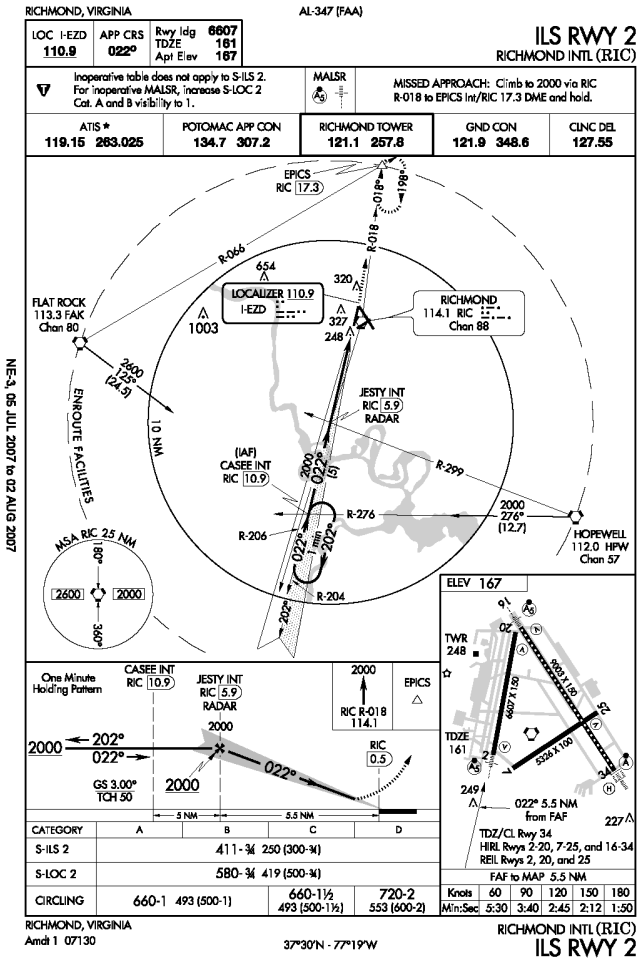
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	<3/4 SM	**KNOWN DEFICIENCIES**
	REQUIRED	
TERPS Paragraph 251	34:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	4,200 ft (Paved)	None
Runway Markings	Precision	None
Holding Position Signs and Markings	Precision	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	MALSR, SSALR, or ALSF Required	None
Runway Design Standards	<3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 9, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Richmond International (RIC)

Richmond, Virginia

Procedure Overview



ILS RWY 2 - ILS

FAA PROCEDURE DATA	
Critical Obstacle:	248 **see note 1**
Required Obstacle Clearance:	
Remote Altimeter Adjustment:	
Accuracy Code Adjustment:	
Other Adjustment:	**see note 2**
Rounding Adjustment:	
Minimum Descent Altitude / Decision Height:	411

Note 1: OL Pole (KRIC0005)

Note 2:

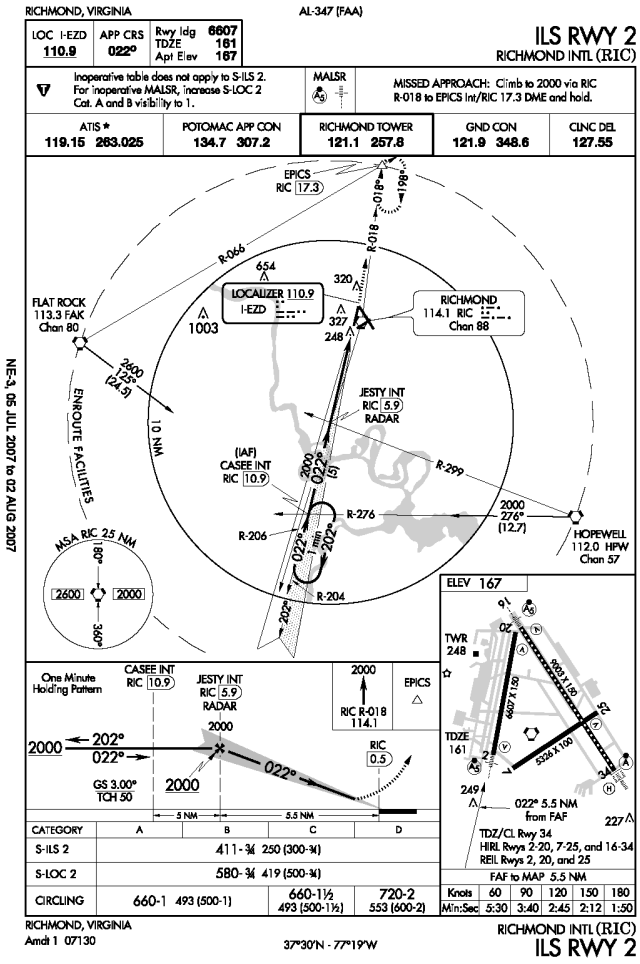
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1A - PRECISION INSTRUMENT APPROACH REQUIREMENTS		
	<1 SM	**KNOWN DEFICIENCIES**
	REQUIRED	
TERPS Paragraph 251	20:1 Clear	
Airport Layout Plan	Required	
Minimum Runway Length	4,200 ft (Paved)	
Runway Markings	Nonprecision	
Holding Position Signs and Markings	Nonprecision	
Runway Edge Lights	HIRL / MIRL	
Parallel Taxiway	Required	
Approach Lights	Recommended	
Runway Design Standards	>=3/4-sm approach visibility minimums	
Threshold Siting Criteria To Be Met	Table A2-1, Row 8, Criteria	
Survey Required for Lowest Minima	Vertically Guided Survey	

Richmond International (RIC)

Richmond, Virginia

Procedure Overview



ILS RWY 2 - LOC

FAA PROCEDURE DATA		
Critical Obstacle:	271	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:	50	
Other Adjustment:		**see note 2**
Rounding Adjustment:	9	
Minimum Descent Altitude / Decision Height:	580	

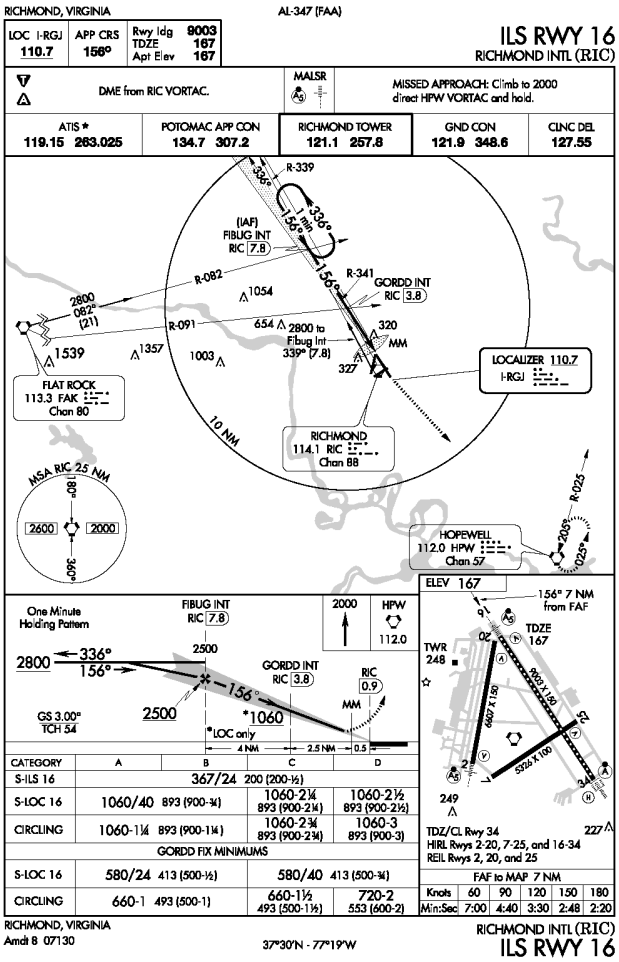
Note 1: Tower (47-1572)

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	<1 SM	**KNOWN DEFICIENCIES**
	REQUIRED	
TERPS Paragraph 251	20:1 Clear	
Airport Layout Plan	Required	
Minimum Runway Length	3,200 ft (Paved)	
Runway Markings	Nonprecision	
Holding Position Signs and Markings	Nonprecision	
Runway Edge Lights	HIRL / MIRL	
Parallel Taxiway	Required	
Approach Lights	Required	
Runway Design Standards	>=3/4-sm approach visibility minimums	
Threshold Siting Criteria To Be Met	Table A2-1, Row 8, Criteria	
Survey Required for Lowest Minima	Non-Vertically Guided Survey	

Procedure Overview



ILS RWY 16 - ILS

FAA PROCEDURE DATA	
Critical Obstacle:	**see note 1**
Required Obstacle Clearance:	
Remote Altimeter Adjustment:	
Accuracy Code Adjustment:	
Other Adjustment:	**see note 2**
Rounding Adjustment:	
Minimum Descent Altitude / Decision Height:	367

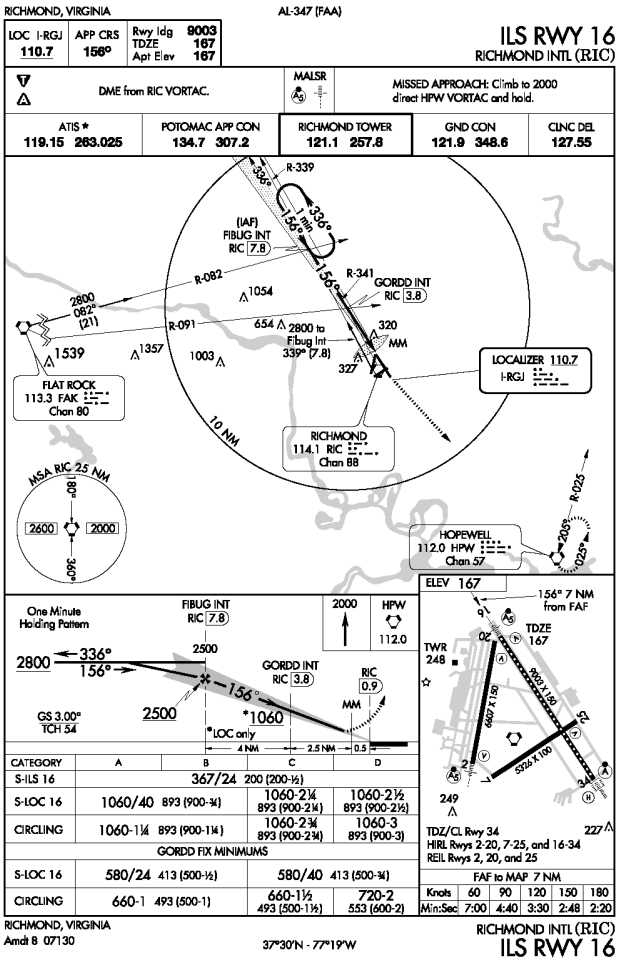
Note 1: none listed

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1A - PRECISION INSTRUMENT APPROACH REQUIREMENTS		
	<3/4 SM	**KNOWN DEFICIENCIES**
	REQUIRED	
TERPS Paragraph 251	34:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	4,200 ft (Paved)	None
Runway Markings	Precision	None
Holding Position Signs and Markings	Precision	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	MALSR, SSALR, or ALSF	None
Runway Design Standards	<3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 9, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Procedure Overview



ILS RWY 16 - LOC

FAA PROCEDURE DATA		
Critical Obstacle:	265	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:	50	
Other Adjustment:		**see note 2**
Rounding Adjustment:	15	
Minimum Descent Altitude / Decision Height:	580	

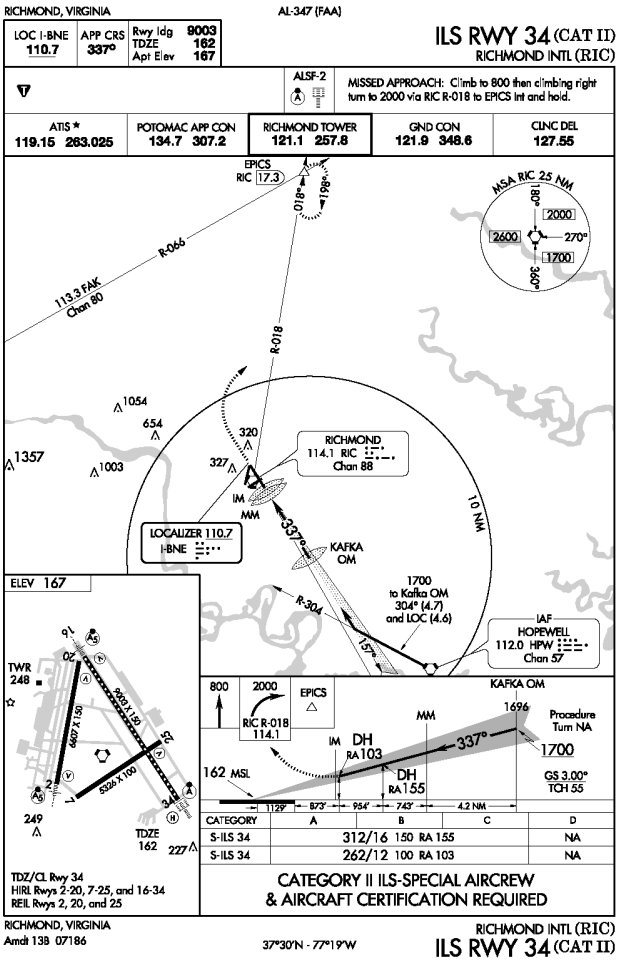
Note 1: Tower (47-1175)

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	<3/4 SM	KNOWN DEFICIENCIES
	REQUIRED	
TERPS Paragraph 251	34:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	4,200 ft (Paved)	None
Runway Markings	Precision	None
Holding Position Signs and Markings	Precision	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	MALSR, SSALR, or ALSF Required	None
Runway Design Standards	<3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 9, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Procedure Overview



ILS RWY 34 (CAT II)

FAA PROCEDURE DATA	
Critical Obstacle:	**see note 1**
Required Obstacle Clearance:	
Remote Altimeter Adjustment:	
Accuracy Code Adjustment:	
Other Adjustment:	**see note 2**
Rounding Adjustment:	
Minimum Descent Altitude / Decision Height:	262

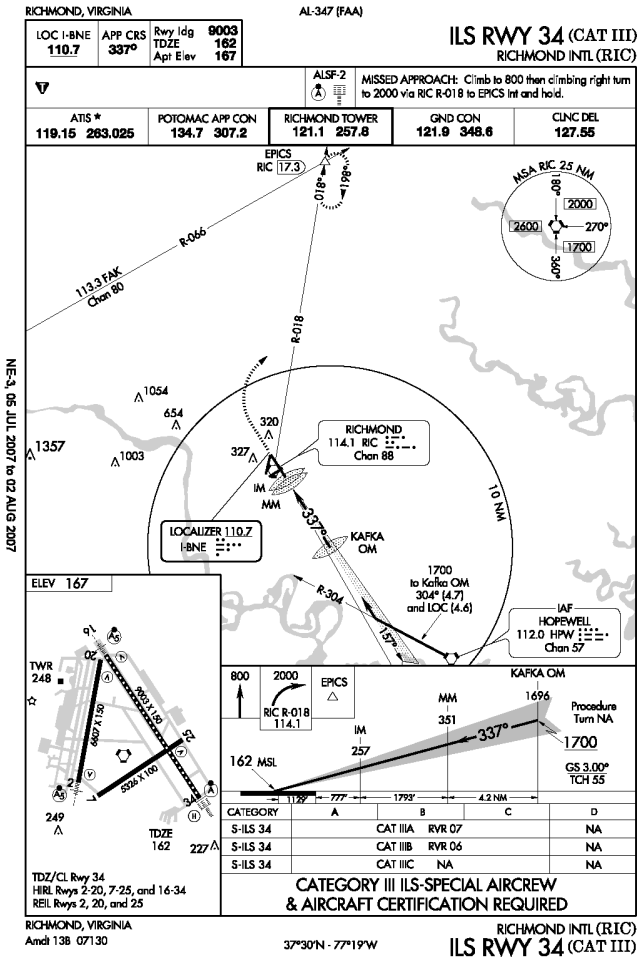
Note 1: CAT II

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1A - PRECISION INSTRUMENT APPROACH REQUIREMENTS		
	<3/4 SM	**KNOWN DEFICIENCIES**
	REQUIRED	
TERPS Paragraph 251	34:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	4,200 ft (Paved)	None
Runway Markings	Precision	None
Holding Position Signs and Markings	Precision	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	MALSR, SSALR, or ALSF	None
Runway Design Standards	<3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 9, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Procedure Overview



ILS RWY 34 (CAT III)

FAA PROCEDURE DATA	
Critical Obstacle:	**see note 1**
Required Obstacle Clearance:	
Remote Altimeter Adjustment:	
Accuracy Code Adjustment:	
Other Adjustment:	**see note 2**
Rounding Adjustment:	
Minimum Descent Altitude / Decision Height:	0

Note 1: CAT III

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

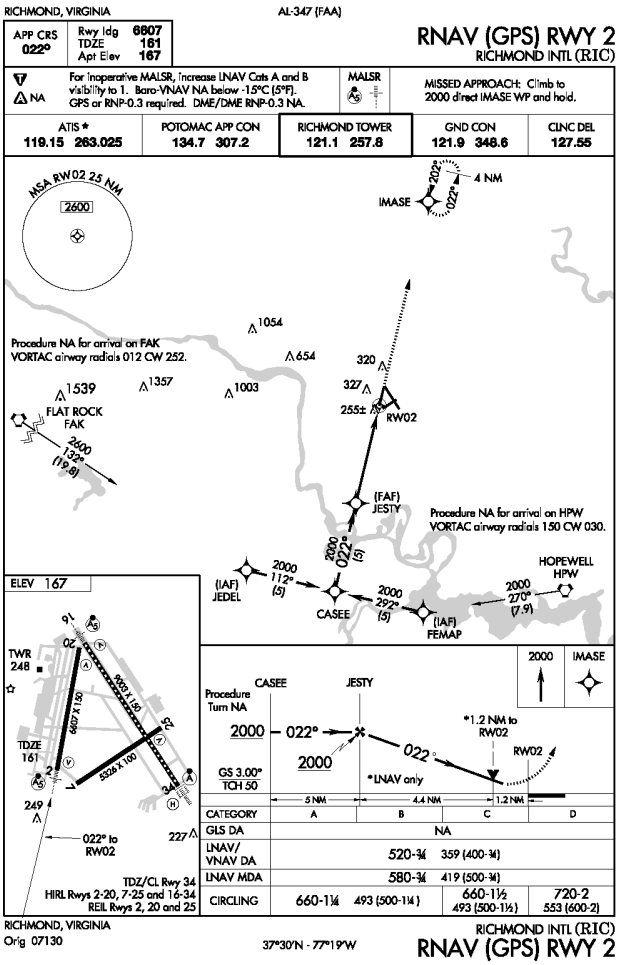
TABLE A16-1A - PRECISION INSTRUMENT APPROACH REQUIREMENTS

	<3/4 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	34:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	4,200 ft (Paved)	None
Runway Markings	Precision	None
Holding Position Signs and Markings	Precision	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	MALSR, SSALR, or ALSF	None
Runway Design Standards	<3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 9, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Richmond International (RIC)

Richmond, Virginia

Procedure Overview



RNAV (GPS) RWY 2 - VNAV

FAA PROCEDURE DATA		
Critical Obstacle:	255	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	15	
Minimum Descent Altitude / Decision Height:	520	

Note 1: Tree (KRIC0017)

Note 2:

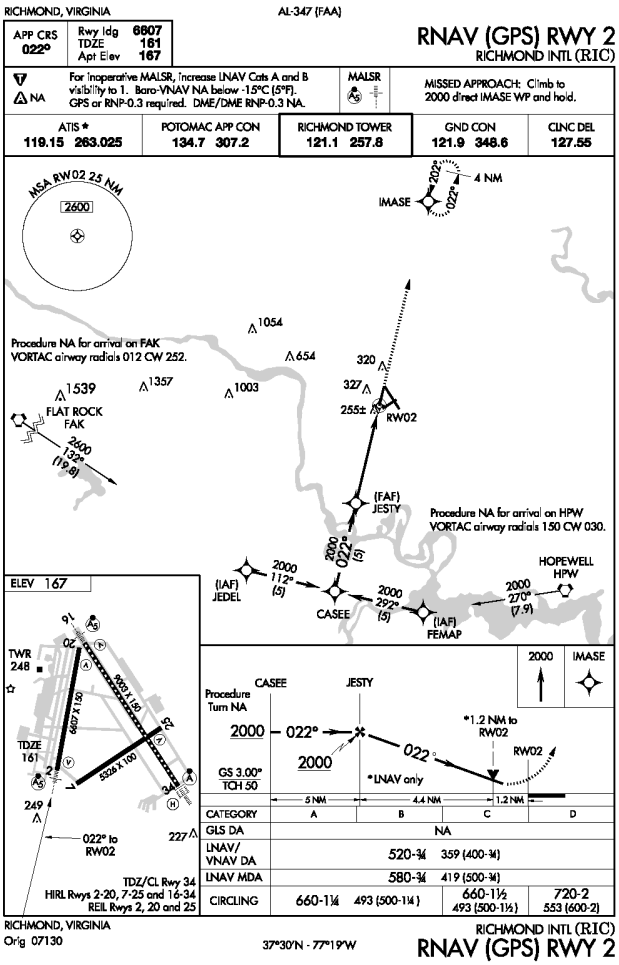
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1B - APPROACH PROCEDURE WITH VERTICAL GUIDANCE APPROACH REQUIREMENTS

	<1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft (Paved)	None
Runway Markings	Nonprecision (precision recommended)	None
Holding Position Signs and Markings	Nonprecision (precision recommended)	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	Required	None
Runway Design Standards	<3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 4 and 9, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Procedure Overview



RNAV (GPS) RWY 2 - LNAV

FAA PROCEDURE DATA		
Critical Obstacle:	271	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:	50	
Other Adjustment:		**see note 2**
Rounding Adjustment:	9	
Minimum Descent Altitude / Decision Height:	580	

Note 1: Tower (47-1572)

Note 2:

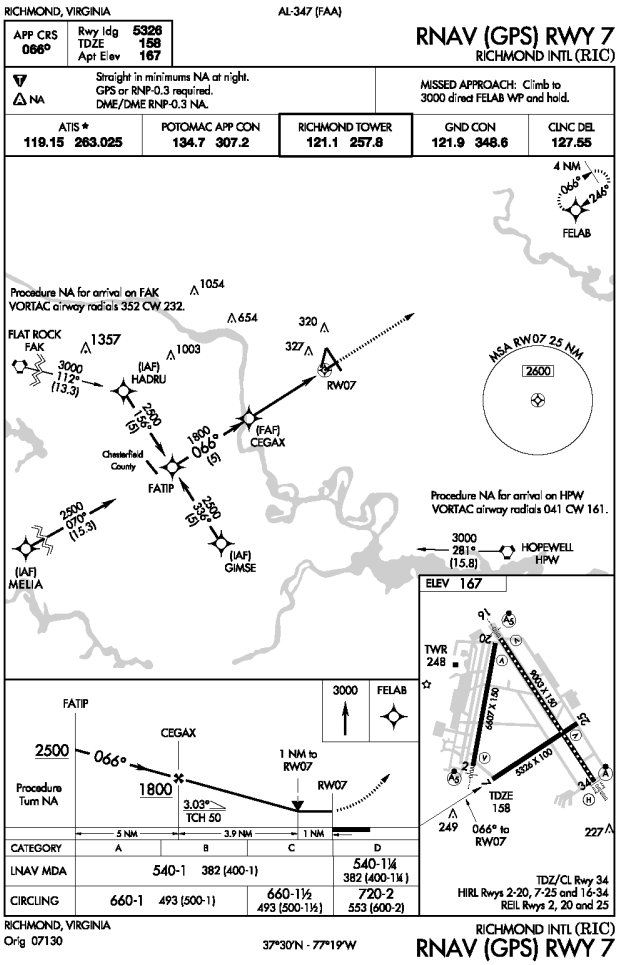
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	<1 SM	**KNOWN DEFICIENCIES**
	REQUIRED	
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft (Paved)	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	Required	None
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 8, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Richmond International (RIC)

Richmond, Virginia

Procedure Overview



RNAV (GPS) RWY 7 - LNAV

FAA PROCEDURE DATA		
Critical Obstacle:	290	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	0	
Minimum Descent Altitude / Decision Height:	540	

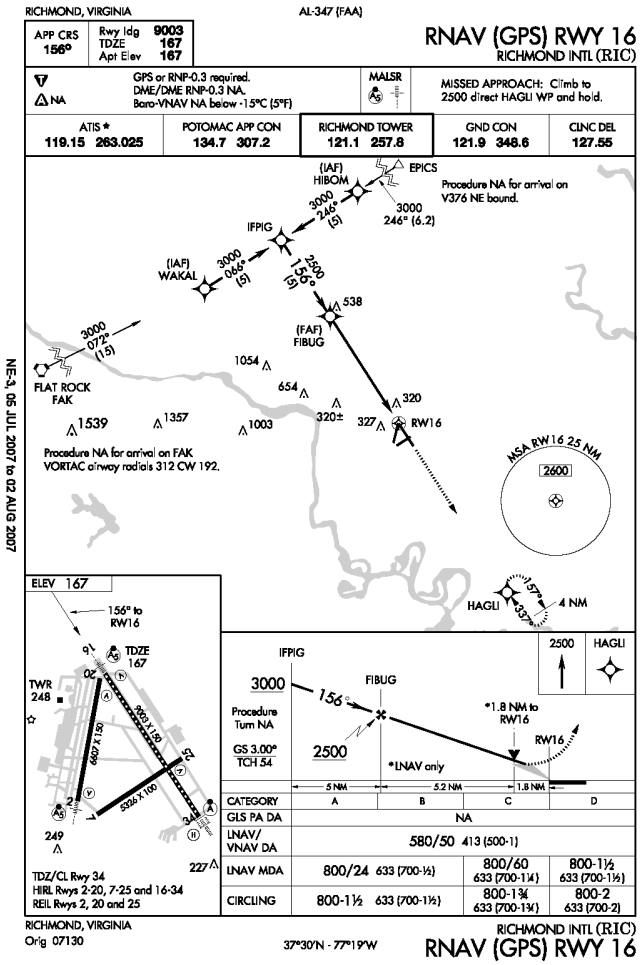
Note 1: Tower (47-1238)

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	1 SM	**KNOWN DEFICIENCIES**
	REQUIRED	
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	Yes
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Overview



RNAV (GPS) RWY 16 - VNAV

FAA PROCEDURE DATA		
Critical Obstacle:	320	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	10	
Minimum Descent Altitude / Decision Height:	580	

Note 1: Tower (47-1567)

Note 2:

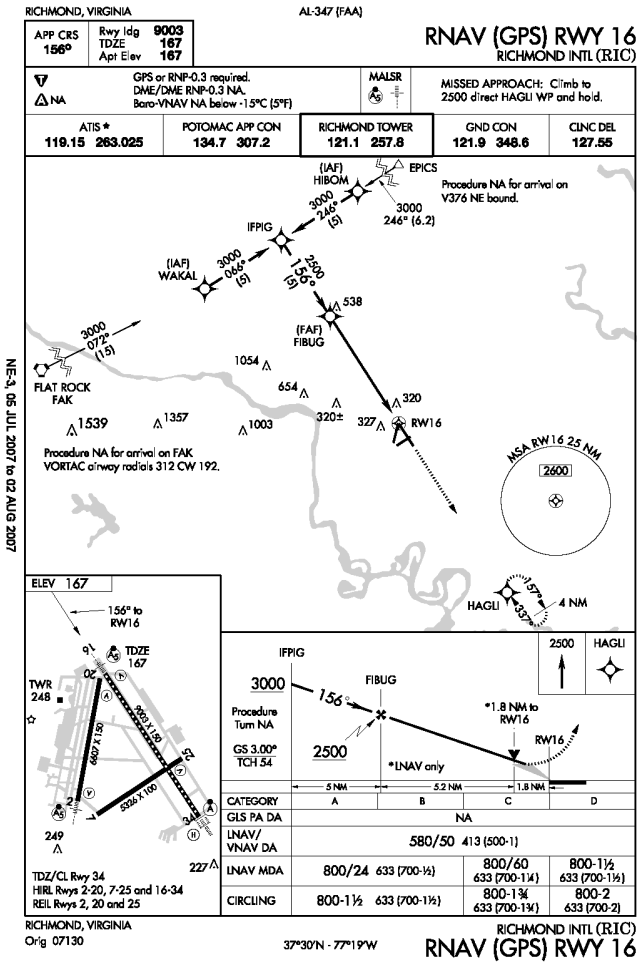
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1B - APPROACH PROCEDURE WITH VERTICAL GUIDANCE APPROACH REQUIREMENTS

	<1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft (Paved)	None
Runway Markings	Nonprecision (precision recommended)	None
Holding Position Signs and Markings	Nonprecision (precision recommended)	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	Required	None
Runway Design Standards	<3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 4 and 9, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Procedure Overview



RNAV (GPS) RWY 16 - LNAV

FAA PROCEDURE DATA		
Critical Obstacle:	431	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:	50	
Other Adjustment:	51	**see note 2**
Rounding Adjustment:	18	
Minimum Descent Altitude / Decision Height:	800	

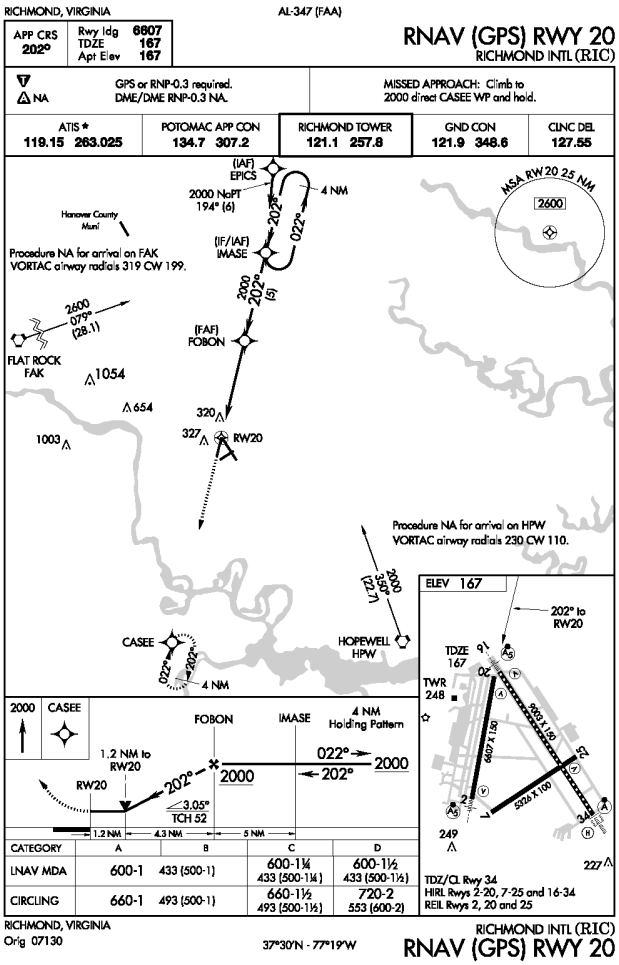
Note 1: Tower(47-0312)

Note 2: extended final approach segment

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	<3/4 SM	**KNOWN DEFICIENCIES**
	REQUIRED	
TERPS Paragraph 251	34:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	4,200 ft (Paved)	None
Runway Markings	Precision	None
Holding Position Signs and Markings	Precision	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	MALSR, SSALR, or ALSF Required	None
Runway Design Standards	<3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 9, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Procedure Overview



RNAV (GPS) RWY 20 - LNAV

FAA PROCEDURE DATA		
Critical Obstacle:	345	see note 1
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		see note 2
Rounding Adjustment:	5	
Minimum Descent Altitude / Decision Height:	600	

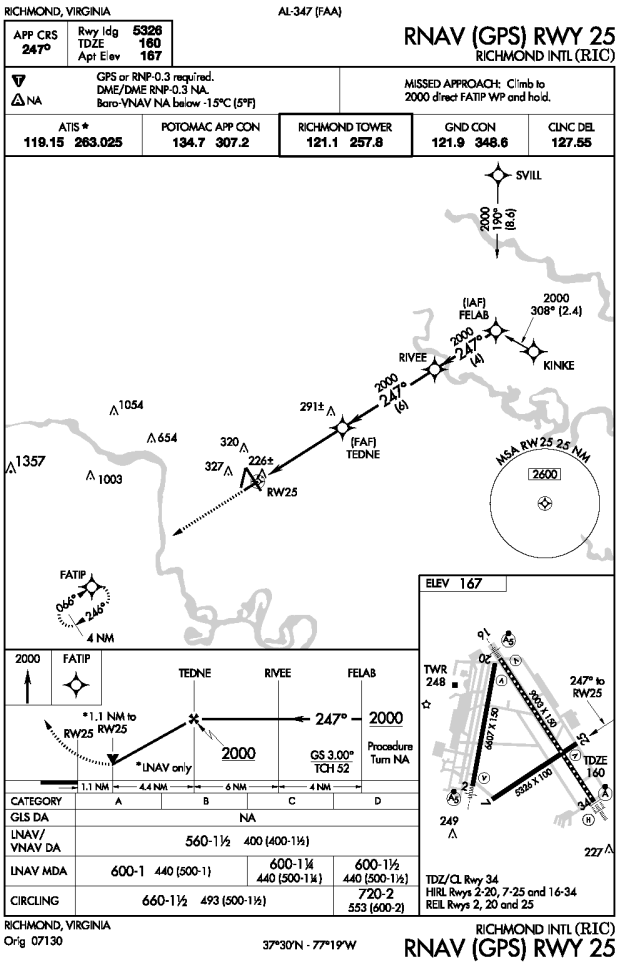
Note 1: ATCT

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	1 SM	KNOWN DEFICIENCIES
	REQUIRED	
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Overview



RNAV (GPS) RWY 25 - VNAV

FAA PROCEDURE DATA	
Critical Obstacle:	226 **see note 1**
Required Obstacle Clearance:	250
Remote Altimeter Adjustment:	
Accuracy Code Adjustment:	
Other Adjustment:	84 **see note 2**
Rounding Adjustment:	
Minimum Descent Altitude / Decision Height:	560

Note 1: Tree (KRIC0020)

Note 2: missed approach segment, FC

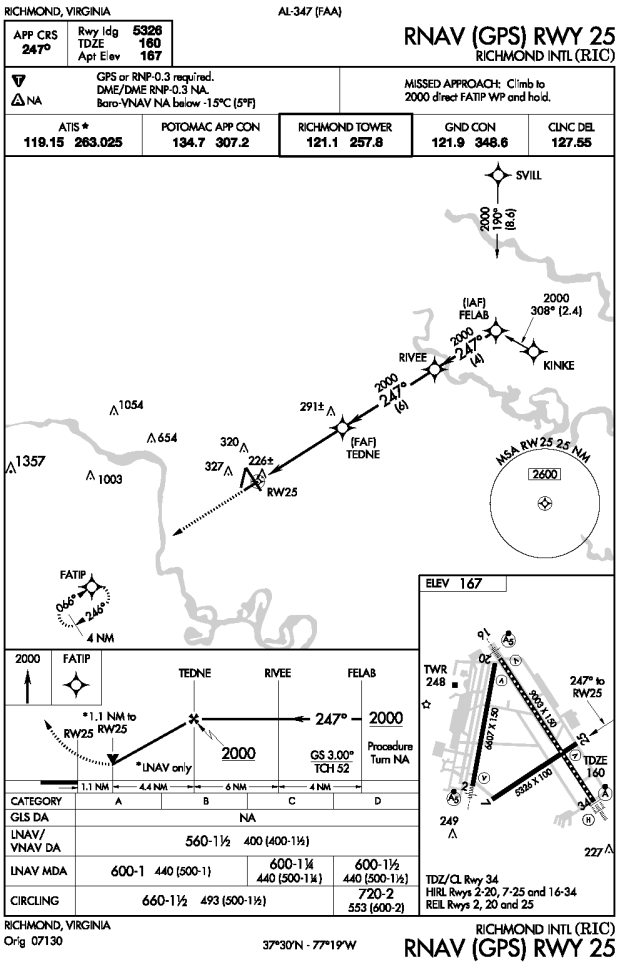
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1B - APPROACH PROCEDURE WITH VERTICAL GUIDANCE APPROACH REQUIREMENTS

	>1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	Yes
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 4 and 8, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Procedure Overview



RNAV (GPS) RWY 25 - LNAV

FAA PROCEDURE DATA		
Critical Obstacle:	296	see note 1
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:	50	
Other Adjustment:		see note 2
Rounding Adjustment:	4	
Minimum Descent Altitude / Decision Height:	600	

Note 1: Cell TWR

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

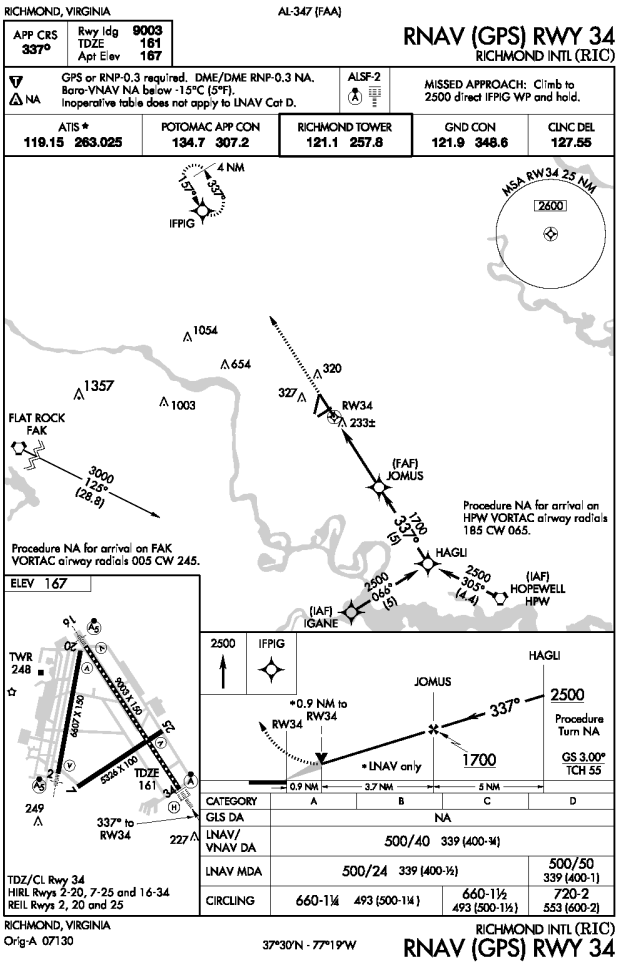
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM REQUIRED	KNOWN DEFICIENCIES
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	Yes
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Richmond International (RIC)

Richmond, Virginia

Procedure Overview



RNAV (GPS) RWY 34 - VNAV

FAA PROCEDURE DATA		
Critical Obstacle:	233	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	17	
Minimum Descent Altitude / Decision Height:	500	

Note 1: Tree (KRIC0036)

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

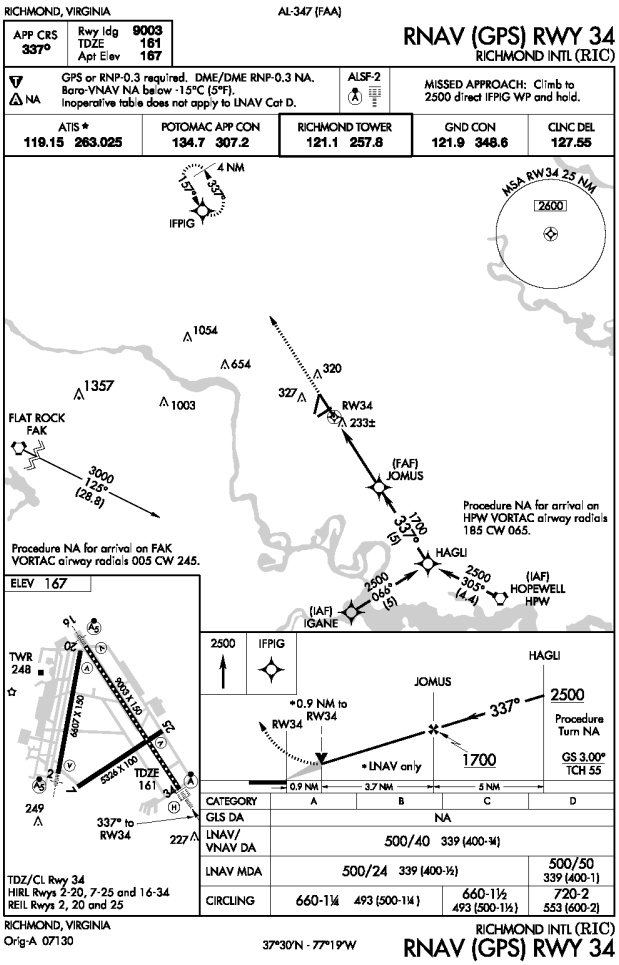
TABLE A16-1B - APPROACH PROCEDURE WITH VERTICAL GUIDANCE APPROACH REQUIREMENTS

	<1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft (Paved)	None
Runway Markings	Nonprecision (precision recommended)	None
Holding Position Signs and Markings	Nonprecision (precision recommended)	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	Required	None
Runway Design Standards	<3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 4 and 9, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Richmond International (RIC)

Richmond, Virginia

Procedure Overview



RNAV (GPS) RWY 34 - LNAV

FAA PROCEDURE DATA		
Critical Obstacle:	233	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	17	
Minimum Descent Altitude / Decision Height:	500	

Note 1: Tree (KRIC0036)

Note 2:

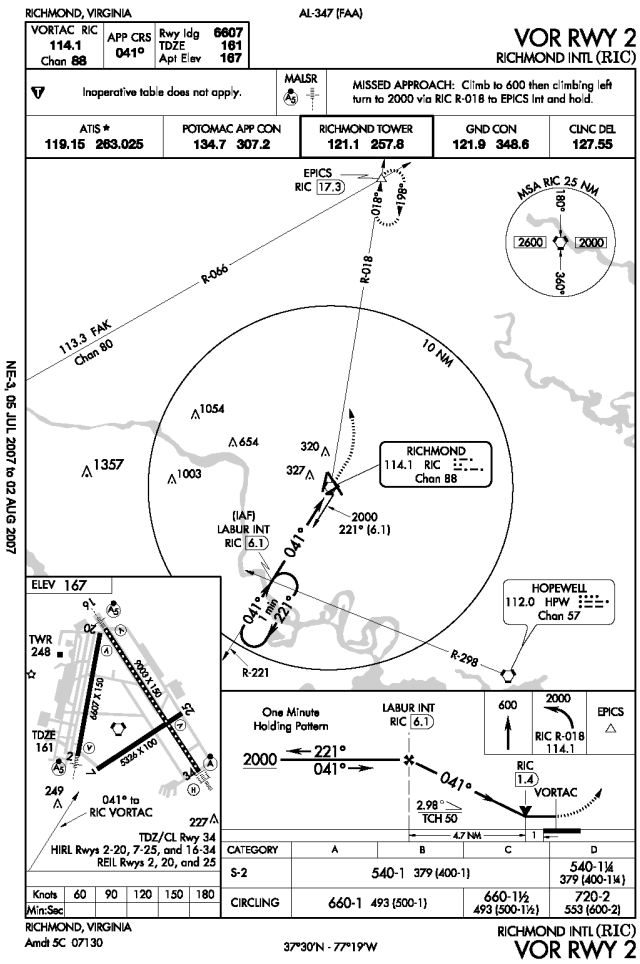
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	<3/4 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	34:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	4,200 ft (Paved)	None
Runway Markings	Precision	None
Holding Position Signs and Markings	Precision	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	MALSR, SSALR, or ALSF Required	None
Runway Design Standards	<3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 9, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Procedure Overview



VOR RWY 2

FAA PROCEDURE DATA		
Critical Obstacle:	290	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:		
Minimum Descent Altitude / Decision Height:	540	

Note 1: Tower

Note 2:

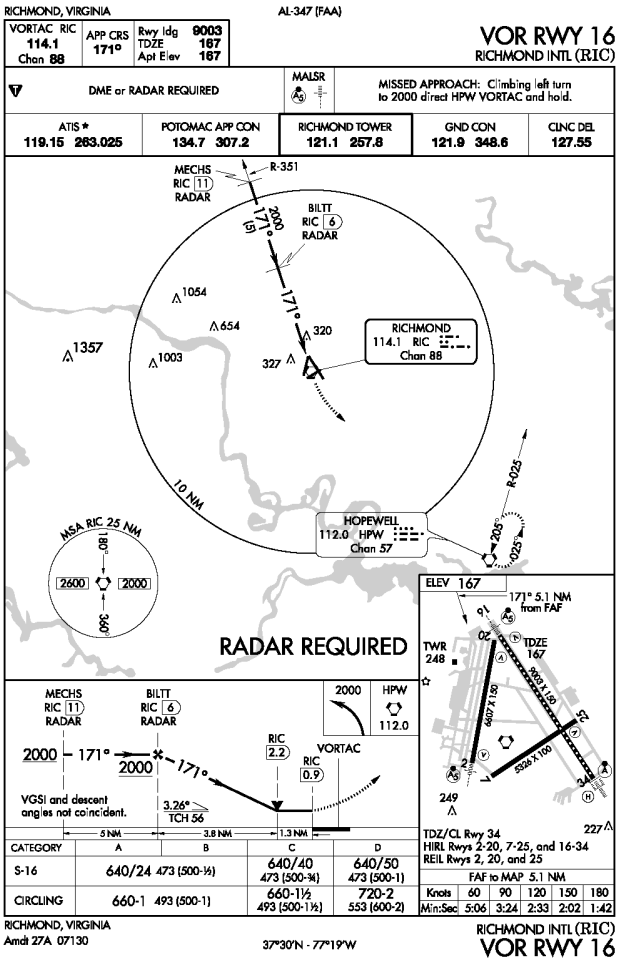
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	None
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Overview



VOR RWY 16

FAA PROCEDURE DATA		
Critical Obstacle:	335	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:	50	
Other Adjustment:		**see note 2**
Rounding Adjustment:	5	
Minimum Descent Altitude / Decision Height:	640	

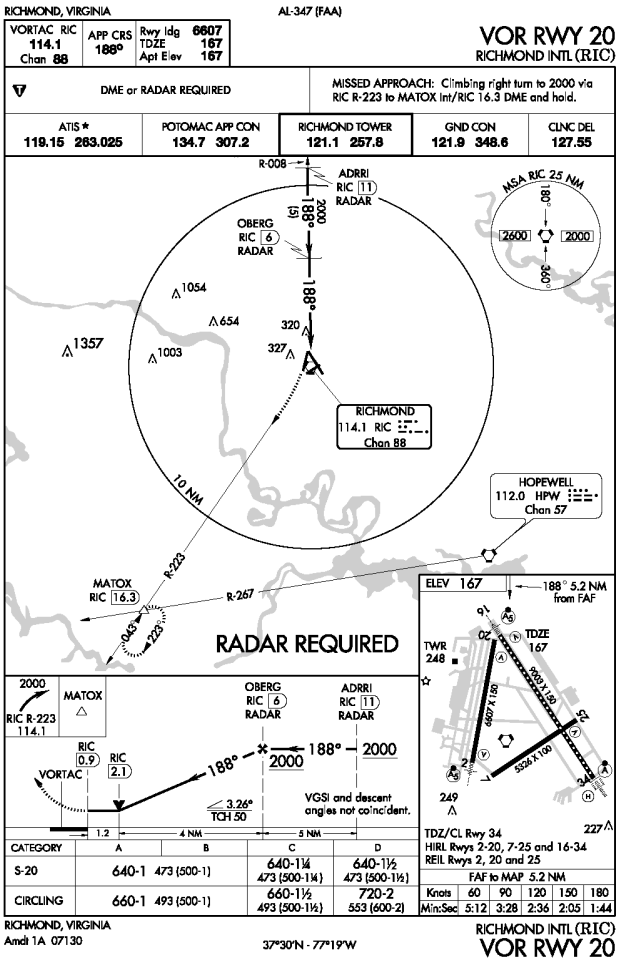
Note 1: TWR (47-1443)

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	<3/4 SM	**KNOWN DEFICIENCIES**
	REQUIRED	
TERPS Paragraph 251	34:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	4,200 ft (Paved)	None
Runway Markings	Precision	None
Holding Position Signs and Markings	Precision	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	MALSR, SSALR, or ALSF Required	None
Runway Design Standards	<3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 9, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Procedure Overview



VOR RWY 20

FAA PROCEDURE DATA		
Critical Obstacle:	335	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:	50	
Other Adjustment:		**see note 2**
Rounding Adjustment:	5	
Minimum Descent Altitude / Decision Height:	640	

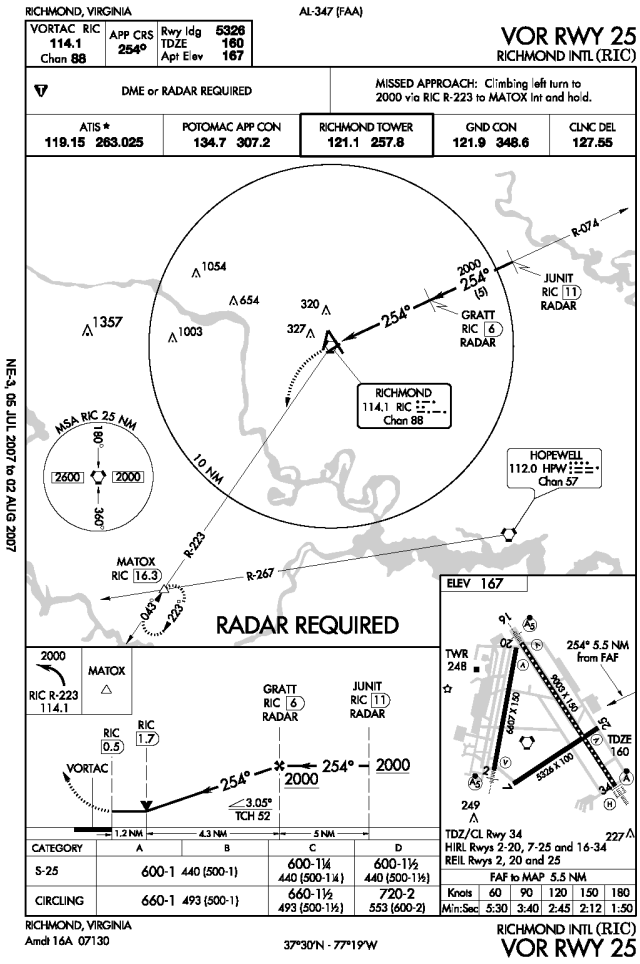
Note 1: TWR (47-1443)

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	1 SM **REQUIRED**	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Overview



VOR RWY 25

FAA PROCEDURE DATA		
Critical Obstacle:	340	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	10	
Minimum Descent Altitude / Decision Height:	600	

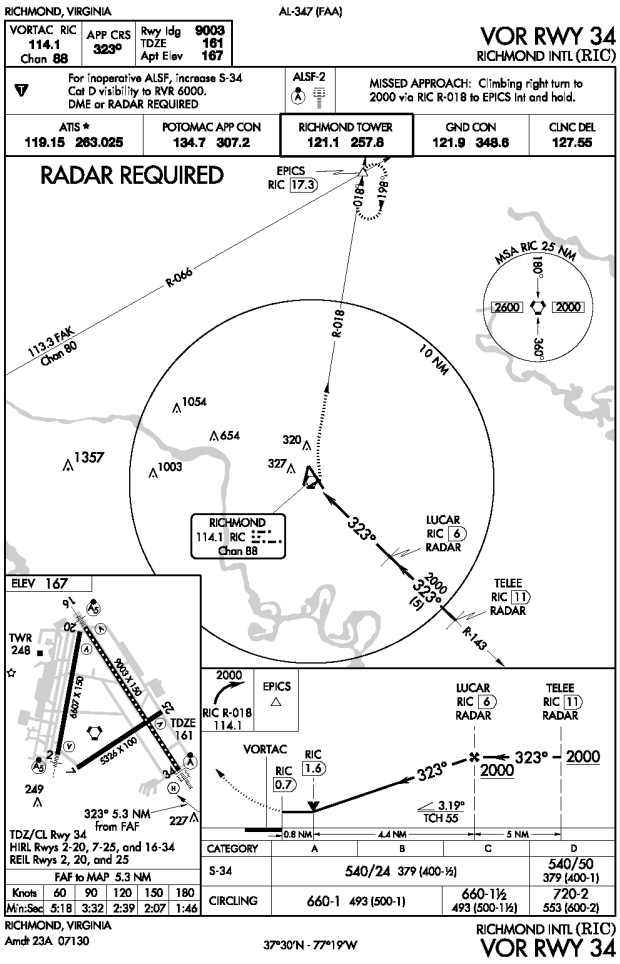
Note 1: Tower

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	1 SM	**KNOWN DEFICIENCIES**
	REQUIRED	
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	Yes
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Overview



VOR RWY 34

FAA PROCEDURE DATA		
Critical Obstacle:	271	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	19	
Minimum Descent Altitude / Decision Height:	540	

Note 1: 100' tree

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	<3/4 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	34:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	4,200 ft (Paved)	None
Runway Markings	Precision	None
Holding Position Signs and Markings	Precision	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	MALSR, SSALR, or ALSF Required	None
Runway Design Standards	<3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 9, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Procedure Recommendations

ILS RWY 34 (CAT II)		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Distance Measuring Equipment Install Distance Measuring Equipment (DME). Co-locate with I-BNE localizer.	Improves pilot's situational awareness and simplifies procedure.	$200,000 (duplicate)

ILS RWY 34 (CAT III)		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Distance Measuring Equipment Install Distance Measuring Equipment (DME). Co-locate with I-BNE localizer.	Improves pilot's situational awareness and simplifies procedure.	$200,000 (duplicate)

RNAV (GPS) RWY 2		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Critical Obstacle Field verify critical obstacle to change accuracy code from "D" to "A" or 50 feet to 3 feet.	Minimum Descent Altitude (MDA) may be reduced by 40 to 60 feet.	Less than $10,000

RNAV (GPS) RWY 7		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a

Procedure Recommendations

RNAV (GPS) RWY 16		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Critical Obstacle Field verify critical obstacle to change accuracy code from "D" to "A" or 50 feet to 3 feet.	Minimum Descent Altitude (MDA) may be reduced by 40 to 60 feet.	Less than $10,000

RNAV (GPS) RWY 20		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a

RNAV (GPS) RWY 25		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Critical Obstacle Field verify critical obstacle to change accuracy code from "D" to "A" or 50 feet to 3 feet.	Minimum Descent Altitude (MDA) may be reduced by 40 to 60 feet.	Less than $10,000

RNAV (GPS) RWY 34		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a

Procedure Recommendations

VOR RWY 02		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a

VOR RWY 16		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Critical Obstacle Field verify critical obstacle to change accuracy code from "D" to "A" or 50 feet to 3 feet.	Minimum Descent Altitude (MDA) may be reduced by 40 to 60 feet.	Less than $10,000

VOR RWY 20		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Critical Obstacle Field verify critical obstacle to change accuracy code from "D" to "A" or 50 feet to 3 feet.	Minimum Descent Altitude (MDA) may be reduced by 40 to 60 feet.	Less than $10,000

VOR RWY 25		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a

Procedure Recommendations

VOR RWY 34		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a

ILS OR LOC RWY 34		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Distance Measuring Equipment Install Distance Measuring Equipment (DME). Co-locate with I-BNE localizer.	Improves pilot's situational awareness and simplifies procedure.	$200,000

ILS RWY 2		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Critical Obstacle Field verify critical obstacle to change accuracy code from "D" to "A" or 50 feet to 3 feet.	Minimum Descent Altitude (MDA) for localizer approach may be reduced by 40 to 60 feet.	Less than $10,000
Obstruction Removal Remove or lower close-in obstruction (light pole) below 34:1 slope.	Visibility may be reduced 1/4 mile. Decision altitude (DA) may be reduced by 50 feet and obtain standard ILS minimums of 200 - 1/2.	$20,000 (duplicate)
Distance Measuring Equipment Install Distance Measuring Equipment (DME). Co-locate with I-EZD localizer.	Improves pilot's situational awareness and simplifies procedure.	$200,000

Procedure Recommendations

ILS OR LOC RWY 16		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Critical Obstacle Field verify critical obstacle to change accuracy code from "D" to "A" or 50 feet to 3 feet.	Minimum Descent Altitude (MDA) for localizer approach may be reduced by 40 to 60 feet.	Less than $10,000
Distance Measuring Equipment Install Distance Measuring Equipment (DME). Co-locate with I-BNE localizer.	Improves pilot's situational awareness and simplifies procedure.	$200,000

Roanoke Regional/Woodrum Field (ROA)

Roanoke, Virginia

AIRPORT INFORMATION

ROLE / CLASSIFICATION INFORMATION	
VATSP Classfication (2008):	Commercial Service
NPIAS Role (2008):	Primary, Non Hub
Study Classification:	Commercial Service (<1 million, >= 200k enplanements)

ACTIVITY INFORMATION	
Based Aircraft (2007):	113
Annual Operations (2020):	146473
Annual Enplanements (2020):	555414

DEVELOPMENT INFORMATION (2008)	
Critical Airport Reference Code (Existing):	C-III
Critical Airport Reference Code (Proposed):	C-IV
Airport Layout Plan (Original):	May, 2000
Airport Layout Plan (Revision):	n/a

Proposed Development (from ALD):

- Extend RWY 15 (500')

AERONAUTICAL SURVEY INFORMATION

Runway End	Survey Type	Survey Date
all	Photoslope	2001
33	PIR	2001
15	BV	2001
24	BV	2001
6	PIR	2001
all	OC - ROA 349	2003

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS

Available Weather Reporting:	ASOS
Common Traffic Advisory Frequency:	118.3
Clearance Delivery:	Direct

Nearby Navigational Aids:

ROANOKE	VORTAC	109.4	ROA	107°/ 4.7 NM TO FIELD
WOODRUM	VOR	114.9	ODR	AT FIELD
VINTON	NDB	277	VIT	334°/ 8.6 NM TO FIELD
ROANOKE	VORTAC	109.4	ROA	107°/ 4.7 NM TO FIELD

Roanoke Regional/Woodrum Field (ROA)

Roanoke, Virginia

Instrument Approach Procedure Summary

Minimums listed are Category B

EXISTING PROCEDURES		
CIRCLING		
VOR/DME-A	1580 - 1 (525)	Amdt 5
RUNWAY 24		
RNAV (GPS) RWY 24 - LNAV	2580 - 1 1/4 (1410)	Orig
RUNWAY 33		
ILS OR LOC RWY 33 - ILS (A,B,C)	1744 - 1 (585)	Amdt 12
ILS OR LOC RWY 33 - ILS (Cat D)	1819 - 1 (585)	Amdt 12
ILS OR LOC RWY 33 - LOC	1940 - 1/2 (781)	Amdt 12
RNAV (GPS) RWY 33 - LNAV	1580 - 1/2 (420)	Orig B
VOR/NDB RWY 33	1700 - 1 1/4 (541)	Orig
RUNWAY 6		
LDA RWY 6	1780 - 1 (605)	Amdt 9
LDA RWY 6 - GS	1580 - 1 (405)	Amdt 9
RNAV (GPS) RWY 6 - LNAV	1780 - 3/4 (604)	Orig

PROCEDURES PROPOSED AS PART OF STUDY
RNAV (GPS) RWY 24 - LPV or LP
RNAV (GPS) RWY 33 - LPV
RNAV (GPS) RWY 6 - LPV
RNAV (RNP) RWY 24
RNAV (RNP) RWY 33
RNAV (RNP) RWY 6

VISIBILITY CHANGES PROPOSED AS PART OF STUDY	
RUNWAY 6:	3/4 SM to 2400 RVR
RUNWAY 33:	1/2 SM to 2400 RVR

REVIEWER COMMENTS

Improvements to RWY 6 and RWY 24 are recommended by the Study and included runway visual range equipment, centerline lights and touchdown zone lights. Vertically-guided (LPV) satellite-based approaches are also recommended for RWY 6, RWY 24 and RWY 33. The Study recommends a reduction in landing visibility minimums. Additional information regarding the estimated impacts and costs associated with the visibility changes is included in Appendix E.

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 15 33 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	C-III	C-IV
Runway Dimensions (Length x Width in ft):	5810 x 150	6300 x 150
Runway to Taxiway Separation (feet):	330	330
Runway Lighting:	HIRL	HIRL
RUNWAY 15		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 700 x 1000	500 x 700 x 1000
Runway Markings:	Visual	Visual
Available Visual Approach Aids:	none	none
RUNWAY 33		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 1010 x 1700	500 x 1010 x 1700
Runway Markings:	Precision	Precision
Available Visual Approach Aids:	PAPI; MALSR	PAPI; MALSR
RUNWAY 6 24 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	C-III	C-IV
Runway Dimensions (Length x Width in ft):	6810 x 150	6810 x 150
Runway to Taxiway Separation (feet):	330	330
Runway Lighting:	HIRL	HIRL
RUNWAY 6		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 1010 x 1700	500 x 1010 x 1700
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	VASI; MALSR	VASI; MALSR
RUNWAY 24		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 700 x 1000	500 x 1010 x 1700
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	REILs	PAPI, REILs

Roanoke Regional/Woodrum Field (ROA)

Roanoke, Virginia

System Benchmarks

Commercial Service (<1 million, > 200k enplanements)			
Best Approach (Primary Runway End)			
BENCHMARK		**RUNWAY 6**	
Approach:	ILS CAT I	☐ meets	LDA RWY 6 - GS
Ceiling:	200 AGL	☐ meets	
Visibility:	1800 RVR	☐ meets	
Approach:	LPV	☐ meets	RNAV (GPS) RWY 6 - LNAV
Ceiling:	200 AGL	☐ meets	
Visibility:	1800 RVR	☐ meets	
Equipment:	ALSF-2 or MALSR, TDZ, CL, HIRLs, RVR, PAPI	☐ meets	existing MALSR, HIRLs
Secondary Approach (Different Runway End)			
BENCHMARK		**RUNWAY 33**	
Approach:	ILS CAT I	☑ meets	ILS RWY 33 - ILS
Ceiling:	200 AGL	☐ meets	
Visibility:	2400 RVR	☐ meets	
Approach:	LPV	☐ meets	RNAV (GPS) RWY 33 - LNAV
Ceiling:	200 AGL	☐ meets	
Visibility:	2400 RVR	☐ meets	
Equipment:	ALSF-2 or MALSR, TDZ, CL, HIRLs, RVR, PAPI	☐ meets	existing MALSR, HIRLs, PAPI
All Ends of Instrument Runways			
BENCHMARK		**RUNWAY 24**	
Approach:	Ground-based	☐ meets	n/a (no ground-based approach available)
Ceiling:	400 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Approach:	LPV	☐ meets	RNAV (GPS) RWY 24 - LNAV
Ceiling:	400 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Equipment:	REILs, HIRLs, PAPI	☐ meets	existing REILs, HIRLs

Weather:	on-field, 24/7, data-linked	☑ meets	
Access to ATC Clearance:	Direct	☑ meets	
ADS-B Coverage:	On ground	☐ meets	

Overall Recommendations

GENERAL		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Radar Coverage Improve radar coverage for west and north sectors.	Improved service.	Unknown
Data link Provide ADS-B coverage while on the ground.	Provides traffic surveillance, terrain avoidance, weather data, etc. Crucial component for Next Generation Air Transportation System.	$100,000
Local Area Augmentation System (LAAS) Provide LAAS coverage to augment existing global positioning system.	Provides enhanced signal accuracy.	Unknown
RUNWAY 6 24		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Runway Lighting Install centerline lights for Runway 6-24.	Improves visibility of runway environment, allows lower landing and take-off visibility minima, maintains landing visibiliity minima below 3/4 statute mile when runway markings are obscured by snow (TERPS 3.1.3).	$800,000
RUNWAY 15 33		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Runway Lighting Install centerline lights for Runway 15-33.	Improves visibility of runway environment, allows lower landing and take-off visibility minima, maintains landing visibiliity minima below 3/4 statute mile when runway markings are obscured by snow (TERPS 3.1.3).	$800,000

Overall Recommendations

RUNWAY 6		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Runway End Identifier Lights Confirm presence of REILs and MALSR; remove REILs.	FAA standards allow for removal of REILs when approach lighting system present.	$10,000
Precision Approach Path Indicator Upgrade Runway 6 VASI to a 4-box PAPI.	Provides improved visual vertical descent guidance information during the approach to the runway.	$200,000
Approach Lighting System Expand lateral operational coverage of Runway 6 approach lighting system. Upgrade MALSR (10 deg. coverage) to ALSF-II (21 deg. coverage).	Improves visibility of system. LDA RWY 6 final approach course is offset 14 degrees, 51 minutes.	$5,000,000
Runway Lighting Install touchdown zone lights for Runway 6.	Improves visibility of runway environment, allows lower landing visibility minima, maintains landing visibiliity minima below 3/4 statute mile when runway markings are obscured by snow (TERPS 3.1.3).	$800,000
Visibility Minimum Upon installation of approach lighting system, touchdown zone lighting and runway visual range, visibility minimums as low as 2400 RVR can be requested.	Lowers landing visibility minimum.	$2,250,000
Weather Reporting Install Runway Visual Range (RVR) equipment.	Replaces prevailing visibility measurement.	$400,000
Aeronautical Survey Request / complete aeronautical survey to enable development of LPV and RNP approaches to Runway 6.	Provides survey data for instrument approach procedures.	$70,000
New Procedure Request development of RNAV (GPS) RWY 6 Approach with LPV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost

Overall Recommendations

RUNWAY 6		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
New Procedure Request development of RNAV (RNP) RWY 6 Approach.	Improve all-weather capability of the runway and airport.	No equipment cost

RUNWAY 24		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Precision Approach Path Indicator Install 4-box PAPI for Runway 24. Shield, as required, for mountainous terrain in approach.	Provides visual vertical descent guidance information during the approach to the runway.	$200,000
Runway Lighting Install touchdown zone lights for Runway 24.	Improves visibility of runway environment, allows lower landing visibility minima, maintains landing visibiliity minima below 3/4 statute mile when runway markings are obscured by snow (TERPS 3.1.3).	$800,000
Aeronautical Survey Request / complete aeronautical survey to enable development of LPV and RNP approaches to Runway 24.	Provides survey data for instrument approach procedures.	$70,000 (duplicate)
New Procedure Request development of RNAV (GPS) RWY 24 Approach with LPV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost
New Procedure Request development of RNAV (RNP) RWY 24 Approach with LPV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost

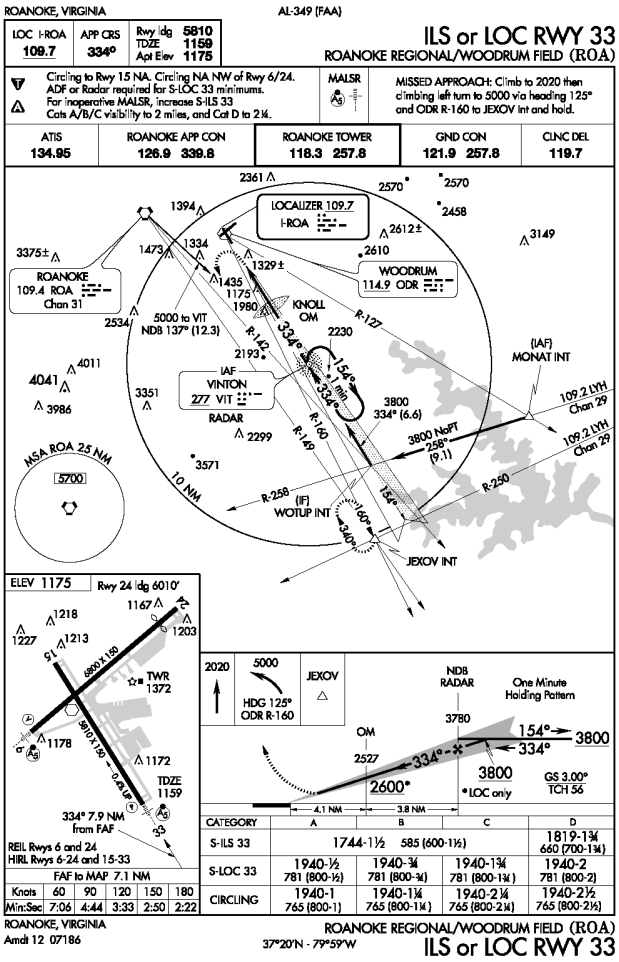
Overall Recommendations

RUNWAY 33		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Aeronautical Survey Request / complete aeronautical survey to enable development of LPV and RNP approaches to Runway 33.	Provides survey data for instrument approach procedures.	$70,000 (duplicate)
Weather Reporting Install Runway Visual Range (RVR) equipment.	Replaces prevailing visibility measurement.	$400,000
Runway Lighting Install touchdown zone lights for Runway 33.	Improves visibility of runway environment, allows lower landing visibility minima, maintains landing visibiliity minima below 3/4 statute mile when runway markings are obscured by snow (TERPS 3.1.3).	$800,000
Visibility Minimum Upon installation of runway visual range equipment and touchdown zone lights, visibility minimums as low as 2400 RVR can be requested.	Lowers landing visibility minimum.	$0
New Procedure Request development of RNAV (GPS) RWY 33 Approach with LPV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost
New Procedure Request development of RNAV (RNP) RWY 33 Approach.	Improve all-weather capability of the runway and airport.	No equipment cost

Roanoke Regional/Woodrum Field (ROA)

Roanoke, Virginia

Procedure Overview



ILS OR LOC RWY 33 - ILS (A,B,C)

FAA PROCEDURE DATA	
Critical Obstacle:	**see note 1**
Required Obstacle Clearance:	
Remote Altimeter Adjustment:	
Accuracy Code Adjustment:	
Other Adjustment:	385 **see note 2**
Rounding Adjustment:	
Minimum Descent Altitude / Decision Height:	1744

Note 1: ASC

Note 2: missed approach segment

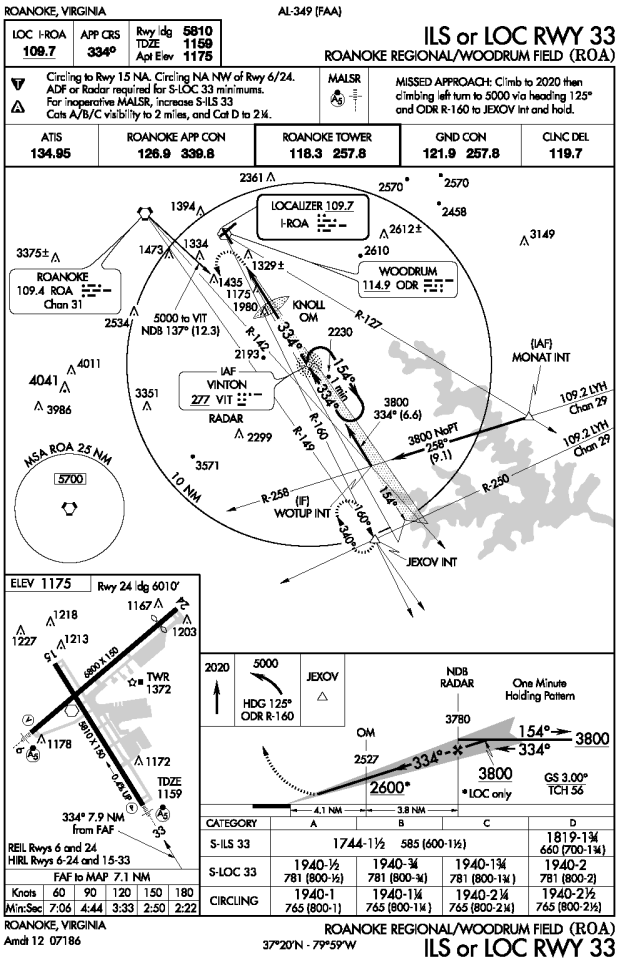
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1A - PRECISION INSTRUMENT APPROACH REQUIREMENTS		
	1 SM	**KNOWN DEFICIENCIES**
	REQUIRED	
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	4,200 ft (Paved)	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	Recommended	None
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 8, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Roanoke Regional/Woodrum Field (ROA)

Roanoke, Virginia

Procedure Overview



ILS OR LOC RWY 33 - ILS (Cat D)

FAA PROCEDURE DATA		
Critical Obstacle:		**see note 1**
Required Obstacle Clearance:		
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:	460	**see note 2**
Rounding Adjustment:		
Minimum Descent Altitude / Decision Height:	1819	

Note 1: ASC

Note 2: missed approach segment

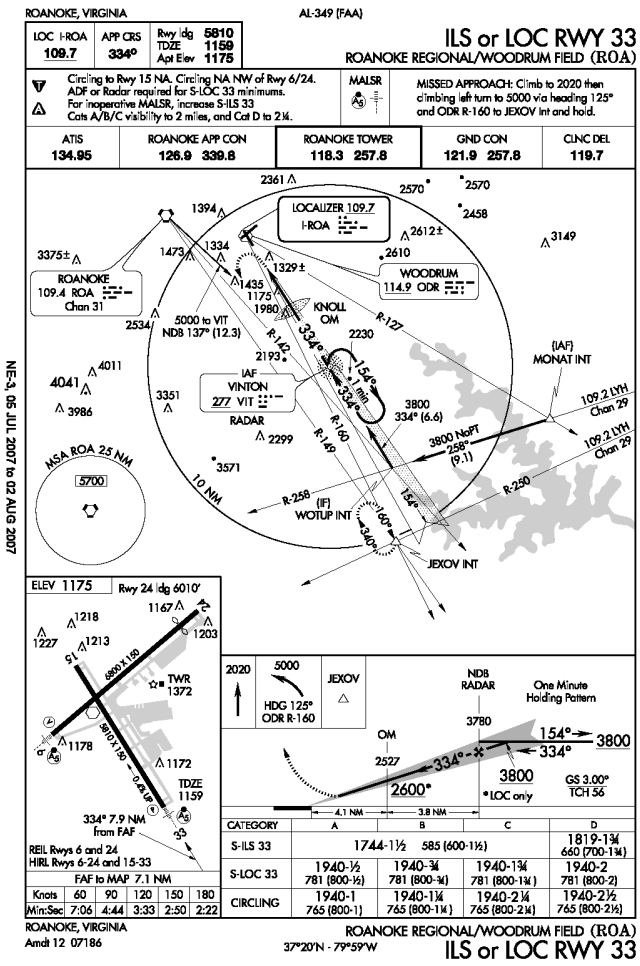
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1A - PRECISION INSTRUMENT APPROACH REQUIREMENTS		
	1 SM **REQUIRED**	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	4,200 ft (Paved)	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	Recommended	None
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 8, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Roanoke Regional/Woodrum Field (ROA)

Roanoke, Virginia

Procedure Overview



ILS OR LOC RWY 33 - LOC

FAA PROCEDURE DATA		
Critical Obstacle:	1175	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:	50	
Other Adjustment:	445	**see note 2**
Rounding Adjustment:	20	
Minimum Descent Altitude / Decision Height:	1940	

Note 1: Tower (47-0860)

Note 2: missed approach segment

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

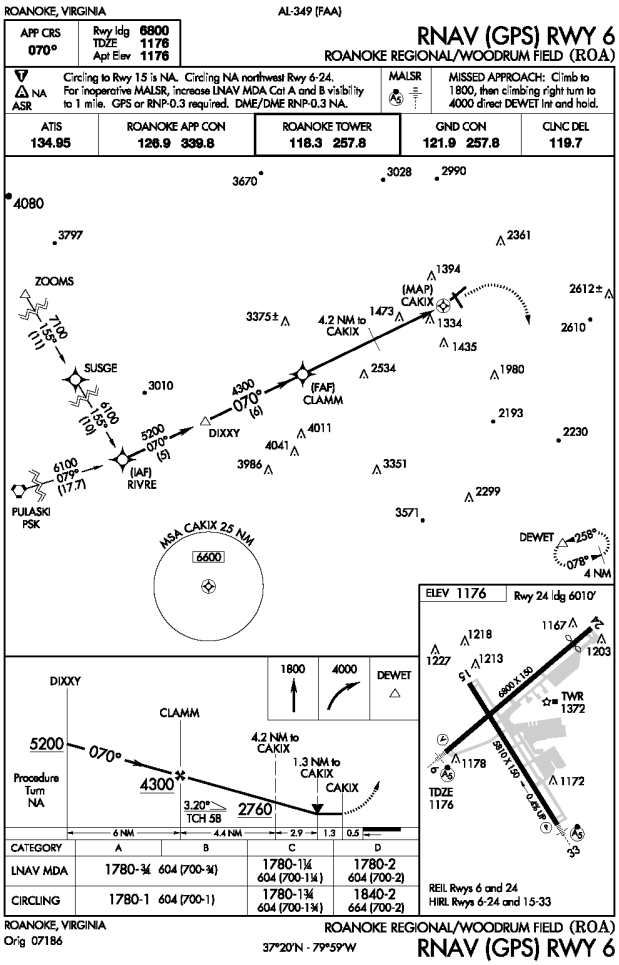
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	<3/4 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	34:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	4,200 ft (Paved)	None
Runway Markings	Precision	None
Holding Position Signs and Markings	Precision	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	MALSR, SSALR, or ALSF Required	None
Runway Design Standards	<3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 9, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Roanoke Regional/Woodrum Field (ROA)

Roanoke, Virginia

Procedure Overview



RNAV (GPS) RWY 6 - LNAV

FAA PROCEDURE DATA		
Critical Obstacle:	1473	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:	50	
Other Adjustment:		**see note 2**
Rounding Adjustment:	7	
Minimum Descent Altitude / Decision Height:	1780	

Note 1: Tower (47-0144)

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

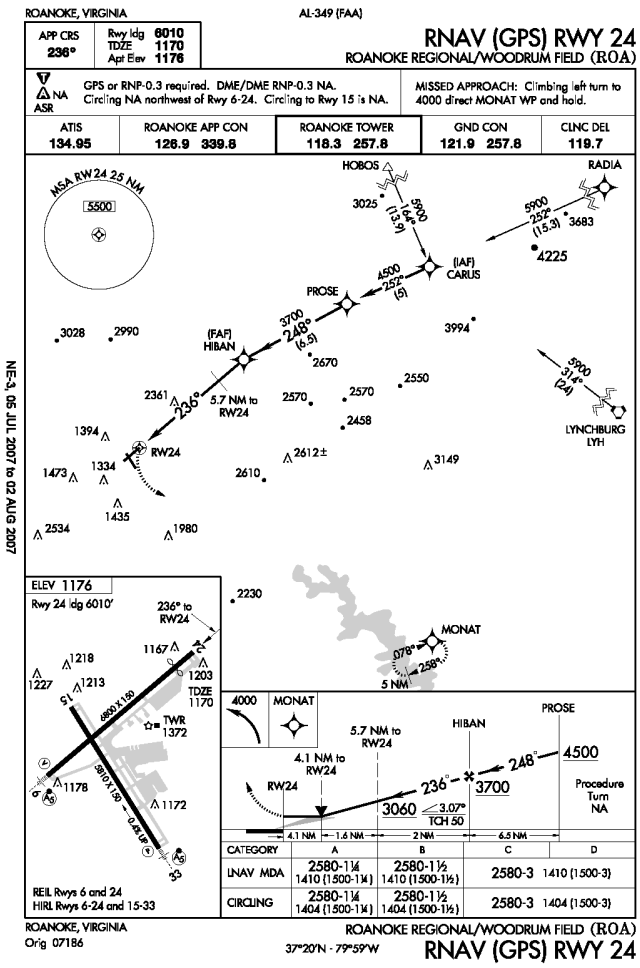
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	<1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft (Paved)	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	Required	None
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 8, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Roanoke Regional/Woodrum Field (ROA)

Roanoke, Virginia

Procedure Overview



RNAV (GPS) RWY 24 - LNAV

FAA PROCEDURE DATA		
Critical Obstacle:	2349	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:	50	
Other Adjustment:	-88	**see note 2**
Rounding Adjustment:	19	
Minimum Descent Altitude / Decision Height:	2580	

Note 1: TWR(47-0841)

Note 2: secondary area adjustment

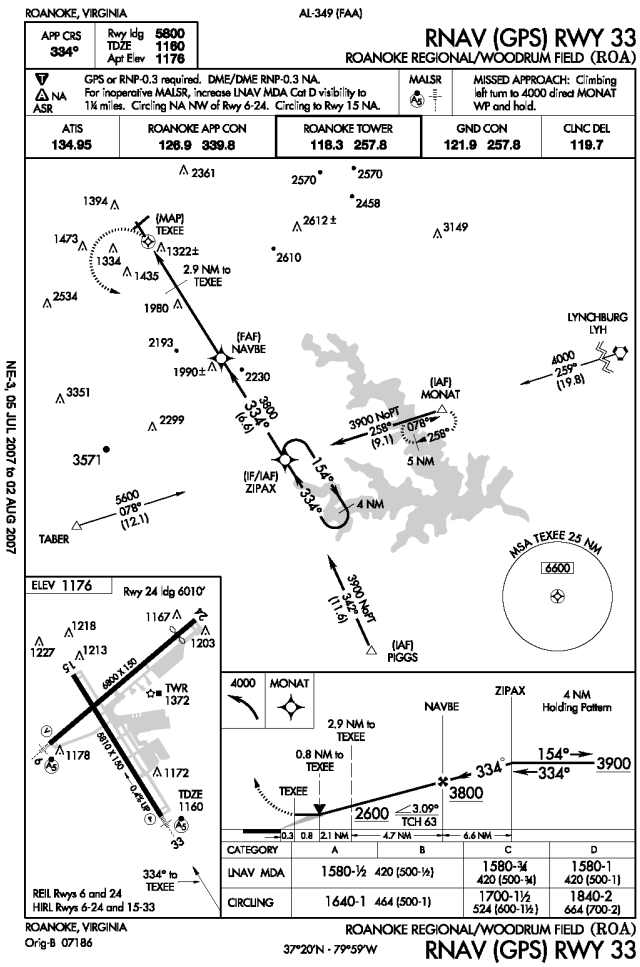
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	>1 SM	**KNOWN DEFICIENCIES**
	REQUIRED	
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Roanoke Regional/Woodrum Field (ROA)

Roanoke, Virginia

Procedure Overview



RNAV (GPS) RWY 33 - LNAV

FAA PROCEDURE DATA		
Critical Obstacle:	1322	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	8	
Minimum Descent Altitude / Decision Height:	1580	

Note 1: Trees

Note 2:

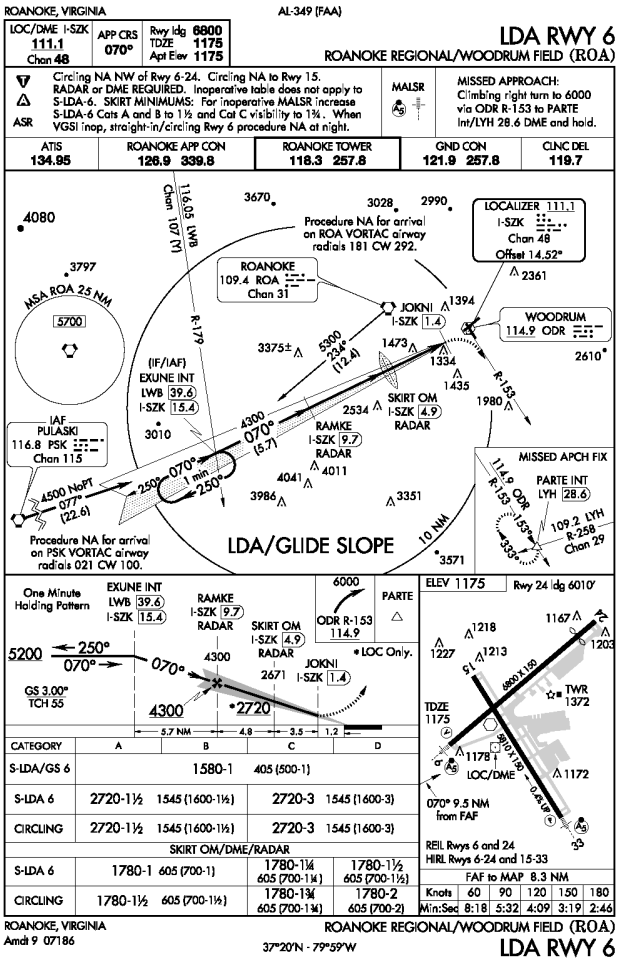
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	<3/4 SM	**KNOWN DEFICIENCIES**
	REQUIRED	
TERPS Paragraph 251	34:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	4,200 ft (Paved)	None
Runway Markings	Precision	None
Holding Position Signs and Markings	Precision	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	MALSR, SSALR, or ALSF Required	None
Runway Design Standards	<3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 9, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Roanoke Regional/Woodrum Field (ROA)

Roanoke, Virginia

Procedure Overview



LDA RWY 6 - GS

FAA PROCEDURE DATA	
Critical Obstacle:	**see note 1**
Required Obstacle Clearance:	
Remote Altimeter Adjustment:	
Accuracy Code Adjustment:	
Other Adjustment:	155 **see note 2**
Rounding Adjustment:	
Minimum Descent Altitude / Decision Height:	1580

Note 1: 40:1 Missed Appr surface

Note 2: missed approach segment

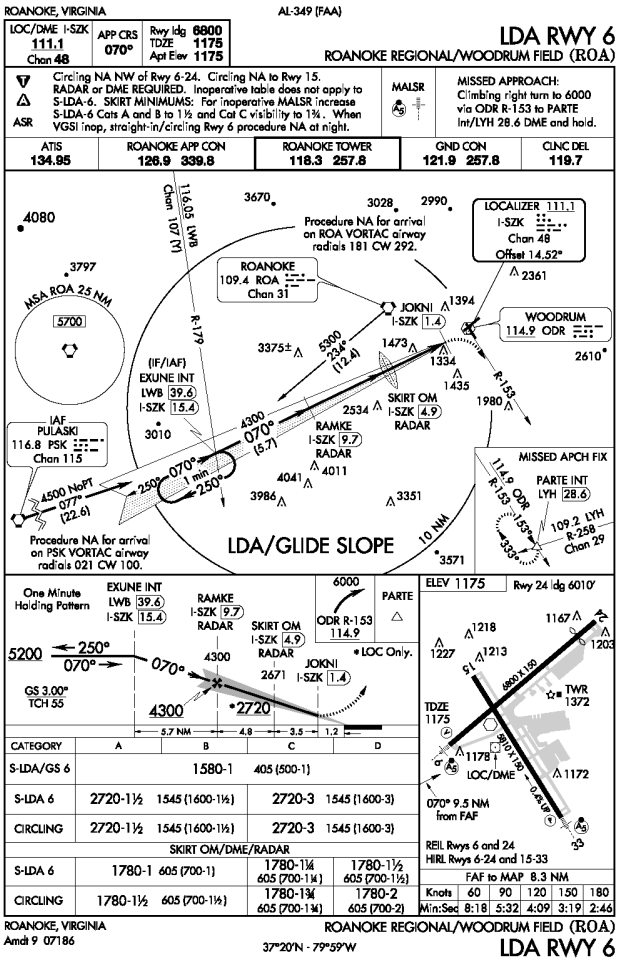
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1B - APPROACH PROCEDURE WITH VERTICAL GUIDANCE APPROACH REQUIREMENTS		
	1 SM **REQUIRED**	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	None
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 4 and 8, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Roanoke Regional/Woodrum Field (ROA)

Roanoke, Virginia

Procedure Overview



LDA RWY 6

FAA PROCEDURE DATA		
Critical Obstacle:	1473	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:	50	
Other Adjustment:		**see note 2**
Rounding Adjustment:	7	
Minimum Descent Altitude / Decision Height:	1780	

Note 1: Tower (47-0144)

Note 2:

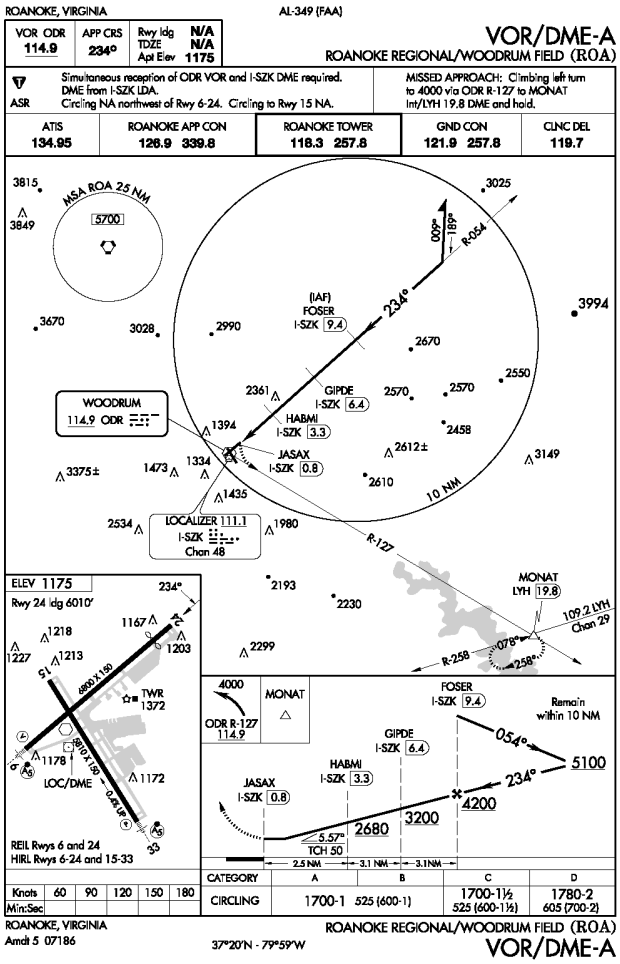
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	None
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Roanoke Regional/Woodrum Field (ROA)

Roanoke, Virginia

Procedure Overview



VOR/DME-A

FAA PROCEDURE DATA		
Critical Obstacle:	1265	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:	50	
Other Adjustment:		**see note 2**
Rounding Adjustment:	15	
Minimum Descent Altitude / Decision Height:	1580	

Note 1: BLDG-TWR (47-1640)

Note 2:

Note 3: different 8260 form

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

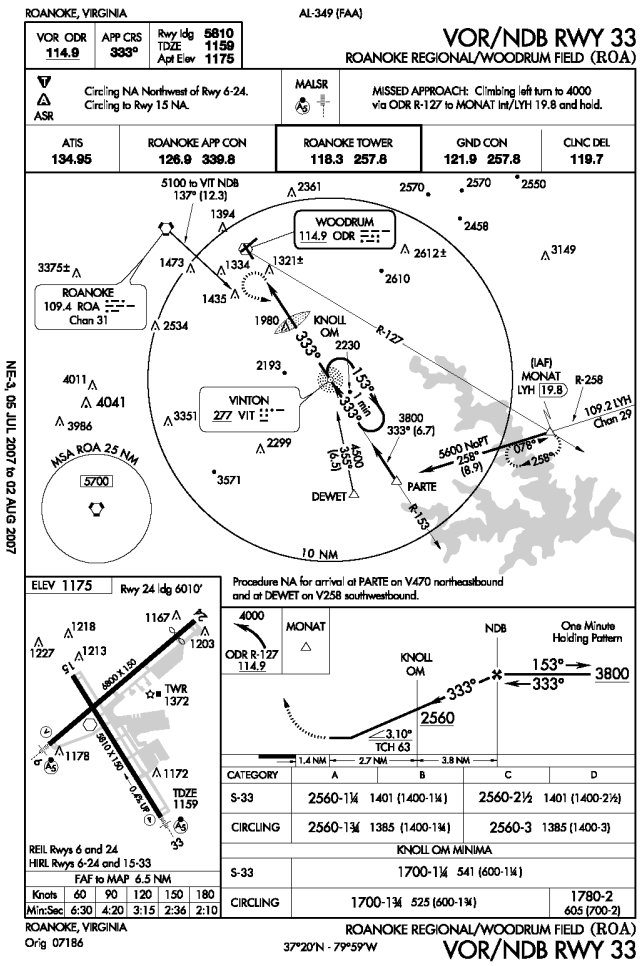
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	CIRCLING	KNOWN DEFICIENCIES
	REQUIRED	
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Recommended	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Visual (Basic)	None
Holding Position Signs and Markings	Visual (Basic)	None
Runway Edge Lights	MIRL / LIRL (for night minima only)	None
Parallel Taxiway	Recommended	None
Approach Lights	Not Required	None
Runway Design Standards	Not Required	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-2, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Roanoke Regional/Woodrum Field (ROA)

Roanoke, Virginia

Procedure Overview



VOR/NDB RWY 33

FAA PROCEDURE DATA		
Critical Obstacle:	1321	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	129	
Minimum Descent Altitude / Decision Height:	1700	

Note 1: Tree (KROA0056)

Note 2: descent gradient

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	>1 SM	**KNOWN DEFICIENCIES**
	REQUIRED	
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	None
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Recommendations

LDA RWY 6		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Weather Reporting Install Runway Visual Range (RVR) equipment.	Reduces visibility minima to as low as 4000 RVR (in lieu of prevailing visibility).	$400,000 (duplicate)
Runway Lighting Install touchdown zone lights for Runway 6. See Overall Recommendations.	Improves visibility of runway environment, allows lower landing visibility minima, maintains landing visibiliity minima below 3/4 statute mile when runway markings are obscured by snow (TERPS 3.1.3).	$800,000 (duplicate)
Runway Lighting Install centerline lights for Runway 6-24. See Overall Recommendations.	Improves visibility of runway environment, allows lower landing and take-off visibility minima, maintains landing visibiliity minima below 3/4 statute mile when runway markings are obscured by snow (TERPS 3.1.3).	$800,000 (duplicate)

VOR / DME A		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Distance Measuring Equipment Install Distance Measuring Equipment (DME). Co-locate with Woodrum VOR (ODR).	Improves pilot's situational awareness and simplifies procedure.	$200,000

Procedure Recommendations

VOR NDB RWY 33		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Weather Reporting Install Runway Visual Range (RVR) equipment. See Overall Recommendations.	Reduces visibility minima to as low as 2400 feet RVR (in lieu of prevailing visibility).	$400,000 (duplicate)

Procedure Recommendations

ILS OR LOC RWY 33		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Critical Obstacle Field verify critical obstacle to change accuracy code from "D" to "A" or 50 feet to 3 feet for localizer approach..	Minimum Descent Altitude (MDA) for localizer approach may be reduced by 40 to 60 feet.	Less than $10,000
Weather Reporting Install Runway Visual Range (RVR) equipment. See Overall Recommendations.	Reduces visibility minima to as low as 2400 feet RVR (in lieu of prevailing visibility).	$400,000 (duplicate)
Runway Lighting Install touchdown zone lights for Runway 33.	Improves visibility of runway environment, allows lower landing visibility minima, maintains landing visibiliity minima below 3/4 statute mile when runway markings are obscured by snow (TERPS 3.1.3).	$800,000 (duplicate)
Runway Lighting Install centerline lights for Runway 15-33.	Improves visibility of runway environment, allows lower landing and take-off visibility minima, maintains landing visibiliity minima below 3/4 statute mile when runway markings are obscured by snow (TERPS 3.1.3).	$800,000 (duplicate)
Distance Measuring Equipment Install Distance Measuring Equipment (DME). Co-locate with I-ROA localizer.	Improves pilot's situational awareness. Preferred method to establish a step-down fix.	$200,000
Step-Down Fix Request localizer procedure be modified to include step-down fix.	Minimum Descent Altitude (MDA) may be reduced for localizer approach.	No equipment cost

Procedure Recommendations

RNAV (GPS) RWY 6		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Critical Obstacle Field verify critical obstacle to change accuracy code from "D" to "A" or 50 feet to 3 feet.	Minimum Descent Altitude (MDA) may be reduced by 40 to 60 feet.	Less than $10,000
Weather Reporting Install Runway Visual Range (RVR) equipment.	Reduces visibility minima to as low as 4000 feet RVR (in lieu of prevailing visibility).	$400,000 (duplicate)

RNAV (GPS) RWY 24		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Critical Obstacle Field verify critical obstacle to change accuracy code from "D" to "A" or 50 feet to 3 feet.	Minimum Descent Altitude (MDA) may be reduced by 40 to 60 feet.	Less than $10,000

RNAV (GPS) RWY 33		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Weather Reporting Install Runway Visual Range (RVR) equipment. See Overall Recommendations.	Reduces visibility minima to as low as 2400 feet RVR (in lieu of prevailing visibility).	$400,000 (duplicate)

Shannon (EZF)

Fredericksburg, Virginia

AIRPORT INFORMATION	
ROLE / CLASSIFICATION INFORMATION	
VATSP Classfication (2008):	General Aviation Community
NPIAS Role (2008):	n/a
Study Classification:	General Aviation Community

ACTIVITY INFORMATION	
Based Aircraft (2007):	
Annual Operations (2020):	62367
Annual Enplanements (2020):	n/a

DEVELOPMENT INFORMATION (2008)	
Critical Airport Reference Code (Existing):	B-I
Critical Airport Reference Code (Proposed):	B-I
Airport Layout Plan (Original):	June, 2002
Airport Layout Plan (Revision):	n/a

Proposed Development (from ALD):

- Construct parallel taxiway

AERONAUTICAL SURVEY INFORMATION

Runway End	Survey Type	Survey Date
all	Photoslope	2007

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS	
Available Weather Reporting:	AWOS-III
Common Traffic Advisory Frequency:	122.8
Clearance Delivery:	GCO (OTS indef)

Nearby Navigational Aids:

SHANNON	NDB	237	EZF	AT FIELD
CASANOVA	VORTAC	116.3	CSN	145°/ 29.8 NM TO FIELD
BROOKE	VORTAC	114.5	BRV	236°/ 6.2 NM TO FIELD
A P HILL	NDB	396	APH	341°/ 12.2 NM TO FIELD

Shannon (EZF)

Fredericksburg, Virginia

Instrument Approach Procedure Summary

Minimums listed are Category B

EXISTING PROCEDURES		
RUNWAY 24		
GPS RWY 24	580 - 1 (495)	Orig
NDB RWY 24	1100 - 1 1/4 (1015)	Amdt 2A

PROCEDURES PROPOSED AS PART OF STUDY
RNAV (GPS) RWY 24 - LP
RNAV (GPS) RWY 6 - LNAV
VOR RWY 24

VISIBILITY CHANGES PROPOSED AS PART OF STUDY	
none	

REVIEWER COMMENTS

A new approach to Runway 6 would eliminate the requirement for circle-to-land operations when the wind and weather conditions favor landing to the northeast. Landing minima to all approaches can be improved by elimination of the Remote Altimeter Setting

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 15 33 (TURF) INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	A-I	A-I
Runway Dimensions (Length x Width in ft):	1500 x 150	1018 x 150
Runway to Taxiway Separation (feet):	none	none
Runway Lighting:	none	none
RUNWAY 15		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	250 x 450 x 1000	250 x 450 x 1000
Runway Markings:	none	none
Available Visual Approach Aids:	none	none
RUNWAY 33		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	250 x 450 x 1000	250 x 450 x 1000
Runway Markings:	none	none
Available Visual Approach Aids:	none	none
RUNWAY 6 24 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	B-I (small)	B-I (small)
Runway Dimensions (Length x Width in ft):	2999 x 100	2857 x 100
Runway to Taxiway Separation (feet):	none	150
Runway Lighting:	MIRL	MIRL
RUNWAY 6		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	250 x 450 x 1000	250 x 450 x 1000
Runway Markings:	Visual	Visual
Available Visual Approach Aids:	PVASI	PAPI
RUNWAY 24		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	250 x 450 x 1000	250 x 450 x 1000
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	PVASI	PAPI

Shannon (EZF)

Fredericksburg, Virginia

System Benchmarks

General Aviation Community			
Best Approach (Primary Runway End)			
BENCHMARK		**RUNWAY 24**	
Approach:	Ground-based	☑ meets	NDB RWY 24
Ceiling:	500 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Approach:	LNAV	☐ meets	GPS RWY 24
Ceiling:	400 AGL	☐ meets	
Visibility:	1 statute mile	☑ meets	
Equipment:	REILs, MIRLs, PAPI	☐ meets	existing MIRLs
Secondary Approach (Different Runway End)			
BENCHMARK		**RUNWAY 6**	
Approach:		☐ meets	n/a (no ground-based approach available)
Ceiling:		☐ meets	
Visibility:		☐ meets	
Approach:	LNAV	☐ meets	n/a (no satellite-based approach available)
Ceiling:	500 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Equipment:	REILs, MIRLs, PAPI	☐ meets	existing MIRLs

Additional Requirements			
Weather:	Normally on-field, 24/7, data-linked	☑ meets	
Access to ATC Clearance:	RTR or GCO	☐ meets	OTS indef.
ADS-B Coverage:	1000 AGL	☐ meets	

Overall Recommendations

GENERAL		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Weather Reporting Upgrade existing AWOS-III to include present weather, lightning and freezing rain sensor.	Improves information available to pilot.	$60,000
Communications Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	Improves pilot/controller communications and clearance delivery process.	Less than $5,000
Data link Provide ADS-B coverage at 1000 AGL or lower.	Provides traffic surveillance, terrain avoidance, weather data, etc. Crucial component for Next Generation Air Transportation System.	Unknown

RUNWAY 6 24		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Airfield Lighting Control Change control sequence and/or facility directory note for MIRLs to be preset on low intensity with higher intensity activated on CTAF.	Provides visibilty of landing environment during night and adverse weather conditions even during times of aircraft equipment failure or pilot control system malfunction.	Less than $10,000

Overall Recommendations

RUNWAY 6		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions.	Standards.	Varies
Runway End Identifier Lights Install REILs for Runway 6.	Improves pilot's ability to detect the landing environment.	$50,000
Precision Approach Path Indicator Install 4-box PAPI for Runway 6.	Provides visual vertical descent guidance information during the approach to the runway.	$70,000
Aeronautical Survey Request / complete aeronautical survey to enable development of LNAV approach to Runway 6.	Provides survey data for instrument approach procedures.	$50,000
New Procedure Request development of RNAV (GPS) RWY 6 Approach with LNAV landing minimums.	Improve all-weather capability of the runway and airport and eliminate requirement for circle-to-land operations.	No equipment cost

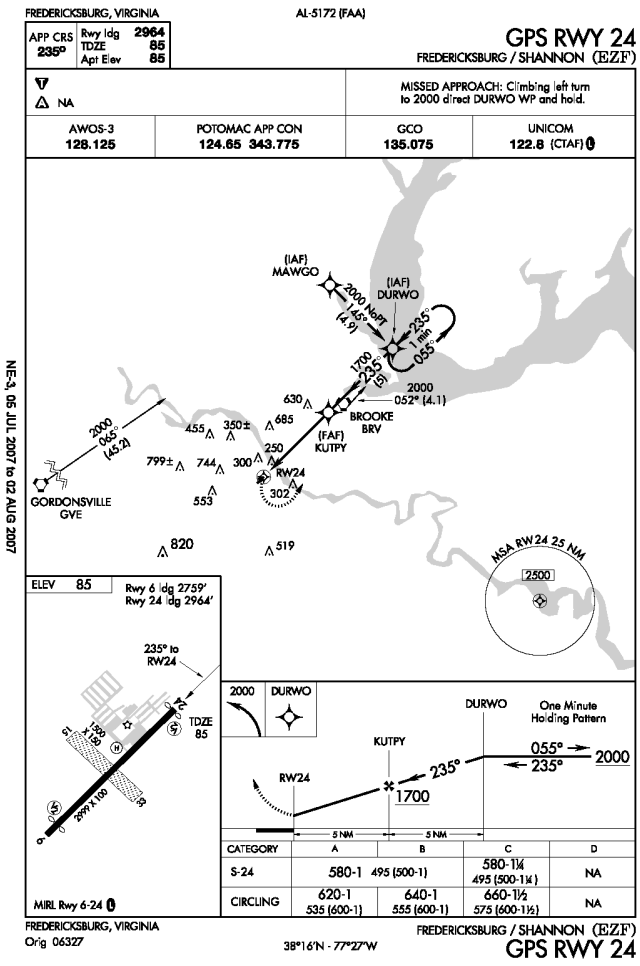
Overall Recommendations

RUNWAY 24		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions (trees).	Standards.	Varies
Runway End Identifier Lights Install REILs for Runway 24.	Improves pilot's ability to detect the landing environment.	$50,000
Precision Approach Path Indicator Install 4-box PAPI for Runway 24.	Provides visual vertical descent guidance information during the approach to the runway.	$70,000
New Procedure Request development of VOR RWY 24 Approach based on BRV VORTAC.	Improve all-weather capability of the runway and airport and provide ground-based approach to the airport.	No equipment cost
Aeronautical Survey Request / complete aeronautical survey to enable development of LP approach to Runway 24.	Provides survey data for instrument approach procedures.	$50,000 (duplicate)
New Procedure Request development of RNAV (GPS) RWY 24 approach with LP landing minimums	Improve all-weather capability of the runway and airport.	No equipment cost

Shannon (EZF)

Fredericksburg, Virginia

Procedure Overview



GPS RWY 24

FAA PROCEDURE DATA		
Critical Obstacle:	329	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	1	
Minimum Descent Altitude / Decision Height:	580	

Note 1: 100' Tree

Note 2:

Note 3:

NE-3, 05 JUL 2007 to 02 AUG 2007

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

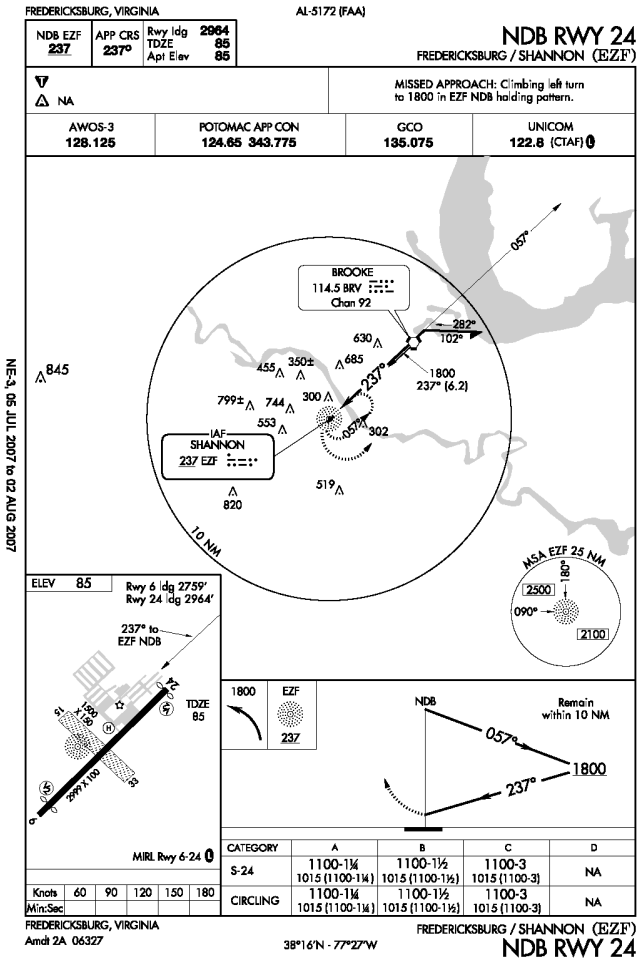
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	Yes
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	Yes
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	Yes
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Shannon (EZF)

Fredericksburg, Virginia

Procedure Overview



NDB RWY 24

FAA PROCEDURE DATA		
Critical Obstacle:	685	**see note 1**
Required Obstacle Clearance:	350	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:	50	
Other Adjustment:		**see note 2**
Rounding Adjustment:	15	
Minimum Descent Altitude / Decision Height:	1100	

Note 1: not listed

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	>1 SM	**KNOWN DEFICIENCIES**
	REQUIRED	
TERPS Paragraph 251	20:1 Clear	Yes
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	Yes
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	Yes
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Recommendations

GPS RWY 24		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Procedure Review (Approach Category) Request deletion of Approach Category C minimums from the procedure.	Better reflects capabilities of airport infrastructure and design standards.	No equipment cost

NDB RWY 24		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Procedure Review Cancel procedure when VOR RWY 24 procedure is published.	Allows decommissioning of NDB.	No equipment cost

Shenandoah Valley Regional (SHD)

Staunton/Waynesboro/Harrisonburg, Virginia

AIRPORT INFORMATION

ROLE / CLASSIFICATION INFORMATION

VATSP Classfication (2008):	Commercial Service
NPIAS Role (2008):	Commercial Service
Study Classification:	Commercial Service (<200k enplanements)

ACTIVITY INFORMATION

Based Aircraft (2007):	77
Annual Operations (2020):	31244
Annual Enplanements (2020):	38398

DEVELOPMENT INFORMATION (2008)

Critical Airport Reference Code (Existing):	C-III
Critical Airport Reference Code (Proposed):	C-III
Airport Layout Plan (Original):	October, 1998
Airport Layout Plan (Revision):	May, 2005

Proposed Development (from ALD):

- Expand RWY 23 RPZ
- Install MALSR (RWY 23)

AERONAUTICAL SURVEY INFORMATION

Runway End	Survey Type	Survey Date
all	Photoslope	2001
all	OC-SHD 5369	1999
23	BV	1999
5	PIR	1999
23	ANA-LPV	underway

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS

Available Weather Reporting:	AWOS-III (PT)
Common Traffic Advisory Frequency:	123.0
Clearance Delivery:	RTR (problematic)

Nearby Navigational Aids:

MONTEBELLO	VOR/DME	115.3	MOL	030°/ 24.0 NM TO FIELD
BRIDGEWATER	NDB	241	VBW	160°/ 6.8 NM TO FIELD

Shenandoah Valley Regional (SHD)

Staunton/Waynesboro/Harrisonburg, Virginia

Instrument Approach Procedure Summary

Minimums listed are Category B

EXISTING PROCEDURES		
RUNWAY 23		
GPS RWY 23	1580 - 1 (379)	Orig
RUNWAY 5		
ILS RWY 5 - ILS	1384 - 1/2 (200)	Amdt 8A
ILS RWY 5 - LOC	1620 - 1/2 (200)	Amdt 8A
NDB OR GPS RWY 5	1700 - 3/4 (517)	Amdt 9B

PROCEDURES PROPOSED AS PART OF STUDY
LOC RWY 23
RNAV (GPS) RWY 23 - LPV
RNAV (GPS) RWY 5 - LNAV
RNAV (GPS) RWY 5 - LPV
RNAV (RNP) RWY 23
RNAV (RNP) RWY 5

VISIBILITY CHANGES PROPOSED AS PART OF STUDY	
RUNWAY 5:	1/2 SM to 2400 RVR
RUNWAY 23:	1 SM to 1/2 SM

REVIEWER COMMENTS

The Airport is listed as a Part 121.446 "Pilot-in-Command airport qualification: special areas and airports". The Study recommends a reduction in landing visibility minimums. Additional information regarding the estimated impacts and costs associated with the visibility changes is included in Appendix E. The Airport Sponsor completed the requested informational survey.

SPONSOR COMMENTS

For emergency planning purposes, Sponsor notes that airport does have a generator system for airport lighting.

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 5 23 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	C-III	C-III
Runway Dimensions (Length x Width in ft):	6002 x 150	6002 x 150
Runway to Taxiway Separation (feet):	400	400
Runway Lighting:	HIRL	HIRL
RUNWAY 5		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	1000 x 1750 x 2500	1000 x 1750 x 2500
Runway Markings:	Precision	Precision
Available Visual Approach Aids:	PAPI; MALSR	PAPI; MALSR
RUNWAY 23		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 1010 x 1700	1000 x 1750 x 2500
Runway Markings:	Non-Precision	Precision
Available Visual Approach Aids:	PAPI; REILs	PAPI; MALSR

Shenandoah Valley Regional (SHD)

Staunton/Waynesboro/Harrisonburg, Virginia

System Benchmarks

Commercial Service (<200k enplanements)			
Best Approach (Primary Runway End)			
BENCHMARK		**RUNWAY 5**	
Approach:	ILS CAT I	☑ meets	ILS RWY 5 - ILS
Ceiling:	200 AGL	☑ meets	
Visibility:	2400 RVR	☐ meets	
Approach:	LPV	☐ meets	NDB OR GPS RWY 5
Ceiling:	200 AGL	☐ meets	
Visibility:	2400 RVR	☐ meets	
Equipment:	MALSR, HIRLs, RVR, PAPI	☐ meets	existing MALSR, HIRLs, PAPI
Secondary Approach (Different Runway End)			
BENCHMARK		**RUNWAY 23**	
Approach:	Ground-based	☐ meets	n/a (no ground-based approach available)
Ceiling:	400 AGL	☐ meets	
Visibility:	3/4 staute mile	☐ meets	
Approach:	LPV	☐ meets	GPS RWY 23
Ceiling:	250 AGL	☐ meets	
Visibility:	3/4 statute mile	☐ meets	
Equipment:	MALS, HIRLs, PAPI	☐ meets	existing HIRLs, PAPI

Additional Requirements			
Weather:	on-field, 24/7, data-linked	☑ meets	
Access to ATC Clearance:	Direct or RTR	☑ meets	RTR reported somewhat unreliable
ADS-B Coverage:	On ground	☐ meets	

Overall Recommendations

GENERAL		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Radar Coverage Provide improved radar coverage.	Improved service.	Unknown
Weather Reporting Upgrade existing AWOS-III to include freezing rain sensor.	Improves information available to pilot.	$50,000
Communications Install a Remote Transmitter / Receiver (RTR) directly with Potomac Approach.	Provides direct communication with approach control via radio and an "on-demand" telephone land line link. Used by aircraft on ground for obtaining or canceling IFR clearances.	$40,000
Communications Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	Improves pilot/controller communications and clearance delivery process.	Less than $5,000
Data link Provide ADS-B coverage while on the ground.	Provides traffic surveillance, terrain avoidance, weather data, etc. Crucial component for Next Generation Air Transportation System.	$100,000
Local Area Augmentation System (LAAS) Provide LAAS coverage to augment existing global positioning system.	Provides enhanced signal accuracy.	Unknown

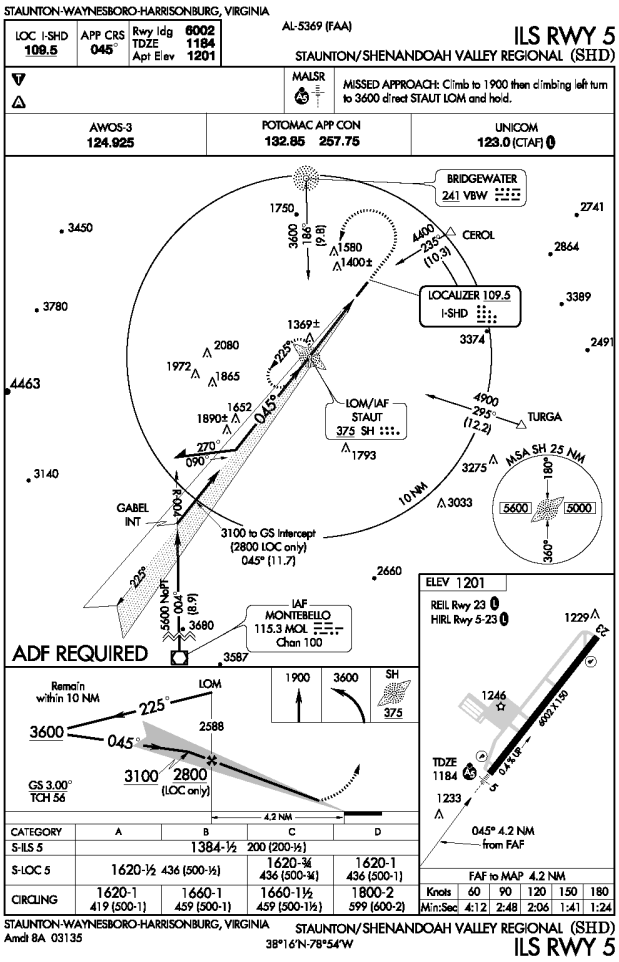
Overall Recommendations

RUNWAY 5		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions.	Standards.	Varies
Weather Reporting Install Runway Visual Range (RVR) equipment.	Replaces prevailing visibility measurement.	$400,000 (duplicate)
Aeronautical Survey Request / update aeronautical survey to enable development of LNAV, LPV and RNP approaches to Runway 5.	Provides survey data for instrument approach procedures.	$40,000
New Procedure Request development of RNAV (GPS) RWY 5 Approach with LPV and LNAV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost
New Procedure Request development of RNAV (RNP) RWY 5 approach.	Improve all-weather capability of the runway and airport.	No equipment cost

Overall Recommendations

RUNWAY 23		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions.	Standards.	Varies
Approach Lighting System Install MALSR for Runway 23.	Improves pilot's ability to detect the landing environment.	$1,250,000
Visibility Minimum Upon installation of approach lighting system and subsequent acceptance of visibility credit, different design standards apply (less than 1 mile).	Lowers landing visibility minimum.	$500,000
Aeronautical Survey Request / complete aeronautical survey to enable development of LPV and RNP approaches to Runway 23.	Provides survey data for instrument approach procedures.	Underway
New Procedure Request development of RNAV (GPS) RWY 23 Approach with LPV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost
New Procedure Request development of RNAV (RNP) RWY 23 Approach.	Improve all-weather capability of the runway and airport.	No equipment cost

Procedure Overview



ILS RWY 5 - ILS

FAA PROCEDURE DATA	
Critical Obstacle:	**see note 1**
Required Obstacle Clearance:	
Remote Altimeter Adjustment:	
Accuracy Code Adjustment:	
Other Adjustment:	**see note 2**
Rounding Adjustment:	
Minimum Descent Altitude / Decision Height:	1384

Note 1: 34:1 clear

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

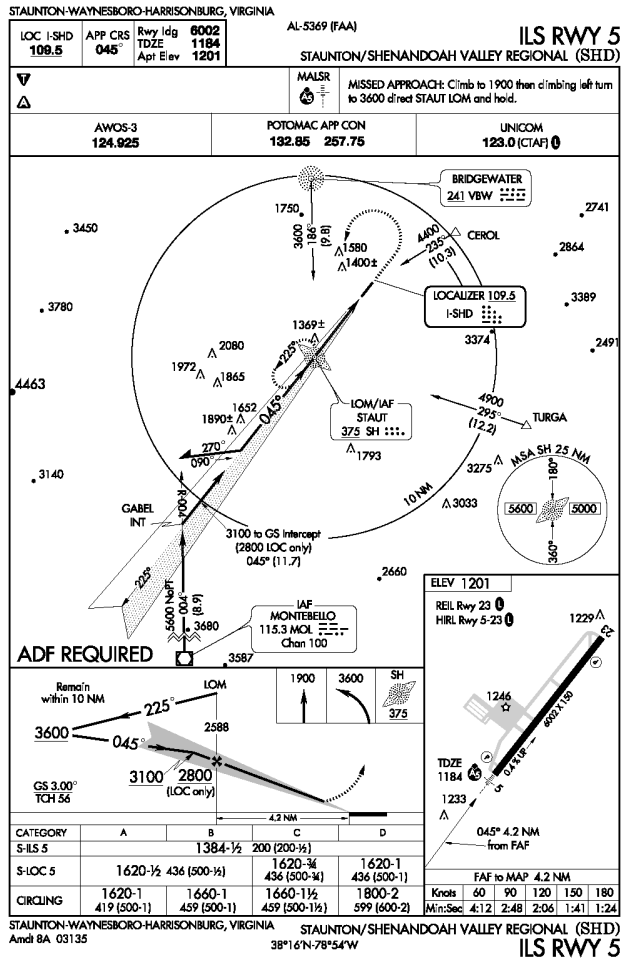
TABLE A16-1A - PRECISION INSTRUMENT APPROACH REQUIREMENTS

	<3/4 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	34:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	4,200 ft (Paved)	None
Runway Markings	Precision	None
Holding Position Signs and Markings	Precision	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	MALSR, SSALR, or ALSF	None
Runway Design Standards	<3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 9, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Shenandoah Valley Regional (SHD)

Staunton/Waynesboro/Harrisonburg, Virginia

Procedure Overview



ILS RWY 5 - LOC

FAA PROCEDURE DATA		
Critical Obstacle:	1369	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	1	
Minimum Descent Altitude / Decision Height:	1620	

Note 1: Twr 3.5SW EOR

Note 2:

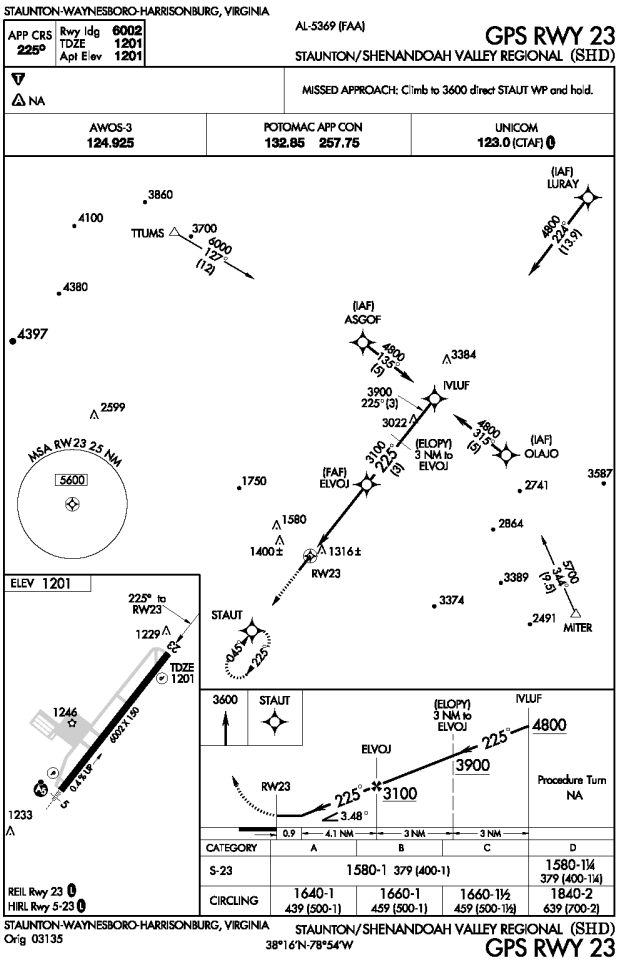
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	<3/4 SM	**KNOWN DEFICIENCIES**
	REQUIRED	
TERPS Paragraph 251	34:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	4,200 ft (Paved)	None
Runway Markings	Precision	None
Holding Position Signs and Markings	Precision	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	MALSR, SSALR, or ALSF Required	None
Runway Design Standards	<3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 9, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Shenandoah Valley Regional (SHD)

Staunton/Waynesboro/Harrisonburg, Virginia

Procedure Overview



GPS RWY 23

FAA PROCEDURE DATA		
Critical Obstacle:	1316	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	14	
Minimum Descent Altitude / Decision Height:	1580	

Note 1: Trees

Note 2:

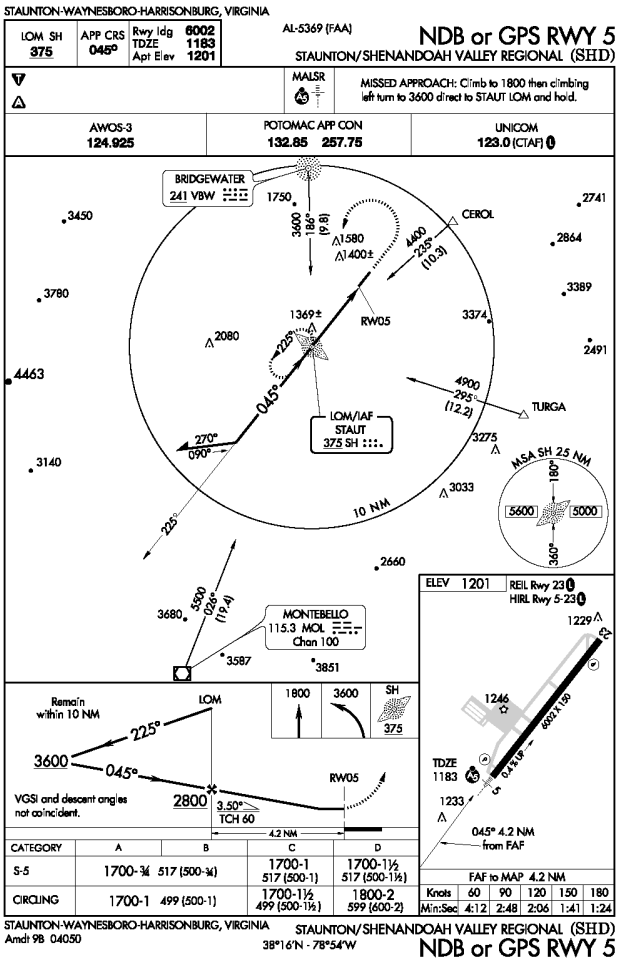
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Overview



NDB OR GPS RWY 5

FAA PROCEDURE DATA		
Critical Obstacle:	1400	**see note 1**
Required Obstacle Clearance:	300	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	0	
Minimum Descent Altitude / Decision Height:	1700	

Note 1: TWR 2.3W EOR

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	<1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft (Paved)	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	Required	None
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 8, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Recommendations

ILS RWY 5		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Weather Reporting Install Runway Visual Range (RVR) equipment. See Overall Recommendations.	Reduces visibility minima to as low as 2400 feet RVR (in lieu of prevailing visibility).	$400,000 (duplicate)
Visibility Minimum Upon installation of runway visual range equipment, request procedure be updated to 2400 RVR.	Lowers landing visibility minimum.	No equipment cost
Procedure Review Request "ADF Required" be added to line 2 of data block.	Procedure clarity.	No equipment cost
Procedure Review Request procedure be modified to eliminate ADF requirement.	Procedure simplification and improved reliability.	No equipment cost
Distance Measuring Equipment Install Distance Measuring Equipment (DME). Co-locate with the localizer.	Improves pilot's situational awareness. Preferred method to establish the final approach fix.	$200,000

Procedure Recommendations

GPS RWY 23		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Approach Lighting System Install MALSR for Runway 23. See Overall Recommendations.	Lowers landing visibility minimum to as low as 3/4 statute mile.	$1,250,000 (duplicate)
Visibility Minimum Upon installation of approach lighting system, request procedure be updated to 1/2 statute mile visibility.	Lower landing visibility minimum.	See Overall Recommendations

NDB OR GPS RWY 5		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Weather Reporting Install Runway Visual Range (RVR) equipment. See Overall Recommendations.	Reduces visibility minima to as low as 2400 feet RVR (in lieu of prevailing visibility).	$400,000 (duplicate)
Visibility Minimum Upon installation of runway visual range equipment, request procedure be updated to 2400 RVR.	Lowers landing visibility minimum.	No equipment cost
Procedure Review Request procedure be updated to separate GPS approach from ground-based approach.	Procedure clarity.	No equipment cost

Smith Mountain Lake (W91)

Moneta, Virginia

AIRPORT INFORMATION	
ROLE / CLASSIFICATION INFORMATION	
VATSP Classfication (2008):	Local Service
NPIAS Role (2008):	n/a
Study Classification:	Local Service

ACTIVITY INFORMATION	
Based Aircraft (2007):	
Annual Operations (2020):	5402
Annual Enplanements (2020):	n/a
DEVELOPMENT INFORMATION (2008)	
Critical Airport Reference Code (Existing):	n/a
Critical Airport Reference Code (Proposed):	n/a
Airport Layout Plan (Original):	March, 1985
Airport Layout Plan (Revision):	n/a

Proposed Development (from ALD):

AERONAUTICAL SURVEY INFORMATION

Runway End	Survey Type	Survey Date
all	Photoslope	2000

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS	
Available Weather Reporting:	None
Common Traffic Advisory Frequency:	122.8
Clearance Delivery:	Phone

Nearby Navigational Aids:

WOODRUM	VOR	114.9	ODR	131°/ 22.6 NM TO FIELD
VINTON	NDB	277	VIT	119°/ 15.0 NM TO FIELD
ROANOKE	VORTAC	109.4	ROA	126°/ 26.9 NM TO FIELD
LYNCHBURG	VORTAC	109.2	LYH	248°/ 19.2 NM TO FIELD

Smith Mountain Lake (W91)

Moneta, Virginia

Instrument Approach Procedure Summary

Minimums listed are Category B

EXISTING PROCEDURES		
RUNWAY 23		
VOR/DME OR GPS RWY 23	1540 - 1 (647)	Orig-A

PROCEDURES PROPOSED AS PART OF STUDY
RNAV (GPS) RWY 23 - LNAV

VISIBILITY CHANGES PROPOSED AS PART OF STUDY	
none	

REVIEWER COMMENTS

none

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 5 23 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	not listed, assumed A-I (small)	not listed, assumed A-1 (small)
Runway Dimensions (Length x Width in ft):	3058 x 50	3058 x 50
Runway to Taxiway Separation (feet):	none	none
Runway Lighting:	MIRL	MIRL
RUNWAY 5		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	250 x 450 x 1000	250 x 450 x 1000
Runway Markings:	Visual	Visual
Available Visual Approach Aids:	none	none
RUNWAY 23		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	250 x 450 x 1000	250 x 450 x 1000
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	REILs	REILs

Overall Recommendations

GENERAL		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Altimeter Source Install AWOS-A.	Provides local altimeter source.	$25,000
Communications Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	Improves pilot/controller communications and clearance delivery process.	Less than $5,000

RUNWAY 5 23		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Runway Lighting Install Medium Intensity Runway Lights (MIRLs).	Improves pilot's ability to detect the runway environment. Eliminates 'OTS indef' note.	$125,000

RUNWAY 5		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions.	Standards.	Varies
Runway End Identifier Lights Install REILs for Runway 5.	Improves pilot's ability to detect the landing environment.	$50,000
Precision Approach Path Indicator Install 4-box PAPI for Runway 5.	Provides visual vertical descent guidance information during the approach to the runway.	$70,000

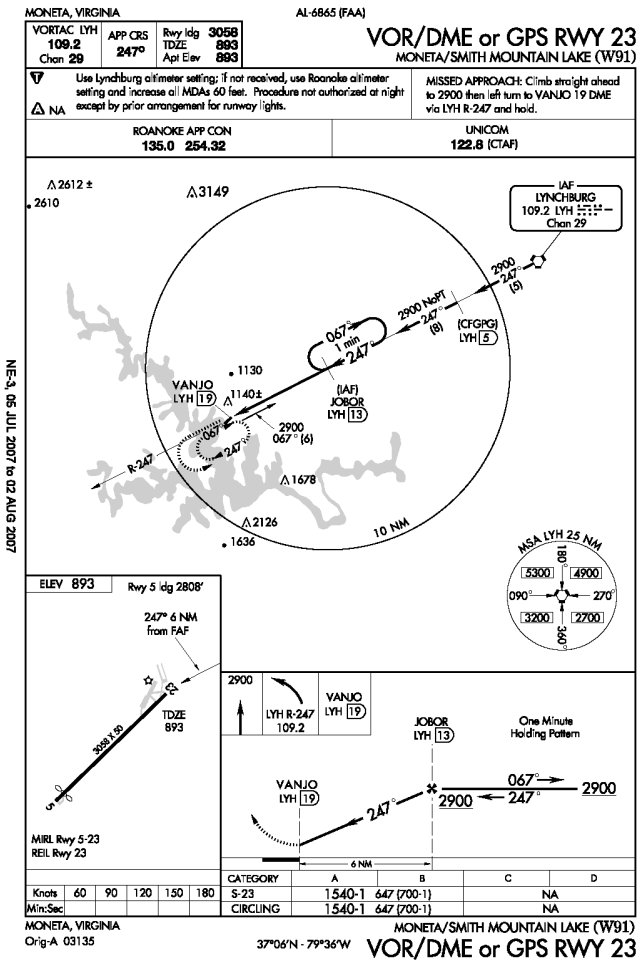
Overall Recommendations

RUNWAY 23		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions.	Standards.	Varies
Runway End Identifier Lights Install REILs for Runway 23.	Improves pilot's ability to detect the landing environment. Eliminates 'OTS indef' note.	$50,000
Precision Approach Path Indicator Install 4-box PAPI for Runway 23.	Provides visual vertical descent guidance information during the approach to the runway.	$70,000
Aeronautical Survey Request / complete aeronautical survey to enable development of LNAV approach to Runway 23.	Provides survey data for instrument approach procedures.	$40,000
New Procedure Request development of RNAV (GPS) RWY 23 Approach with LNAV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost

Smith Mountain Lake (W91)

Moneta, Virginia

Procedure Overview



VOR/DME OR GPS RWY 23

FAA PROCEDURE DATA		
Critical Obstacle:	1140	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:	140	
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	10	
Minimum Descent Altitude / Decision Height:	1540	

Note 1: TRS

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	Yes
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	Yes
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	Yes
Parallel Taxiway	Recommended	Yes
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Recommendations

VOR / DME OR GPS RWY 23		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Procedure Review Request procedure be updated to separate GPS approach from ground-based approach.	Procedure clarity.	No equipment cost
Altimeter Source Install AWOS-A and request FAA re-evaluation of remote altimeter setting source penalty. See Overall Recommendations.	Minimum Descent Altitude (MDA) may be reduced by 140 feet by eliminating the remote altimeter setting source (RASS) adjustment.	$25,000 (duplicate)

Stafford Regional (RMN)

Stafford, Virginia

AIRPORT INFORMATION

ROLE / CLASSIFICATION INFORMATION	
VATSP Classfication (2008):	Reliever
NPIAS Role (2008):	Reliever
Study Classification:	Reliever

ACTIVITY INFORMATION	
Based Aircraft (2007):	19
Annual Operations (2020):	30798
Annual Enplanements (2020):	n/a

DEVELOPMENT INFORMATION (2008)	
Critical Airport Reference Code (Existing):	C-II
Critical Airport Reference Code (Proposed):	C-II
Airport Layout Plan (Original):	August, 1993
Airport Layout Plan (Revision):	n/a

Proposed Development (from ALD):

- Extend RWY 15 (1000')
- Install ODALS (RWY 15)
- Install MALSR (RWY 33)

AERONAUTICAL SURVEY INFORMATION

Runway End	Survey Type	Survey Date
all	Photoslope	2006
all	OC-RMN 9743	2004
33	ANAPC	2004
33	D	2004
15	D	2004

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS

Available Weather Reporting:	AWOS-III (PT)
Common Traffic Advisory Frequency:	122.725
Clearance Delivery:	GCO

Nearby Navigational Aids:

SHANNON	NDB	237	EZF	008°/ 7.9 NM TO FIELD
CASANOVA	VORTAC	116.3	CSN	133°/ 24.1 NM TO FIELD
BROOKE	VORTAC	114.5	BRV	317°/ 6.1 NM TO FIELD

Stafford Regional (RMN)

Stafford, Virginia

Instrument Approach Procedure Summary

Minimums listed are Category B

EXISTING PROCEDURES		
RUNWAY 33		
ILS OR LOC RWY 33 - ILS	396 - 3/4 (200)	Orig
ILS OR LOC RWY 33 - LOC	580 - 3/4 (200)	Orig
RNAV (GPS) RWY 33 - LNAV	700 - 3/4 (254)	Amdt 1
RNAV (GPS) RWY 33 - LPV	450 - 3/4 (254)	Amdt 1
RNAV (GPS) RWY 33 - VNAV	460 - 3/4 (254)	Amdt 1
VOR RWY 33	740 - 3/4 (544)	Amdt 1

PROCEDURES PROPOSED AS PART OF STUDY
RNAV (GPS) RWY 15 - LNAV
RNAV (GPS) RWY 15 - LPV
RNAV (RNP) RWY 15
RNAV (RNP) RWY 33
VOR/DME RWY 15

VISIBILITY CHANGES PROPOSED AS PART OF STUDY	
RUNWAY 33:	3/4 SM to 1/2 SM
RUNWAY 15:	1 SM to 3/4 SM

REVIEWER COMMENTS

A new approach to Runway 15 would eliminate the requirement for circle-to-land operations when the wind and weather conditions favor landing to the south. The Study recommends a reduction in landing visibility minimums. Additional information regarding the estimated impacts and costs associated with the visibility changes is included in Appendix E. The Airport Sponsor completed the requested informational survey.

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 15 33 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	C-II	C-II
Runway Dimensions (Length x Width in ft):	5000 x 100	6000 x 100
Runway to Taxiway Separation (feet):	400	400
Runway Lighting:	HIRL	HIRL
RUNWAY 15		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	1000 x 1510 x 1700	1000 x 1510 x 1700
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	PAPI; REILs	PAPI; ODALS
RUNWAY 33		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	1000 x 1750 x 2500	1000 x 1750 x 2500
Runway Markings:	Precision	Precision
Available Visual Approach Aids:	PAPI; MALS	PAPI; MALSR

Stafford Regional (RMN)

Stafford, Virginia

System Benchmarks

Reliever			
Best Approach (Primary Runway End)			
BENCHMARK		**RUNWAY 33**	
Approach:	ILS CAT I	☑ meets	ILS OR LOC RWY 33 - ILS
Ceiling:	200 AGL	☑ meets	
Visibility:	1/2 statute mile	☐ meets	
Approach:	LPV	☑ meets	RNAV (GPS) RWY 33 - LPV
Ceiling:	200 AGL	☐ meets	
Visibility:	1/2 statute mile	☐ meets	
Equipment:	MALSR, HIRLs, PAPI	☐ meets	existing MALS, HIRL, PAPI
Secondary Approach (Different Runway End)			
BENCHMARK		**RUNWAY 15**	
Approach:	Ground-based	☐ meets	n/a (no ground-based approach available)
Ceiling:	400 AGL	☐ meets	
Visibility:	3/4 staute mile	☐ meets	
Approach:	LPV	☐ meets	n/a (no satellite-based approach available)
Ceiling:	250 AGL	☐ meets	
Visibility:	3/4 statute mile	☐ meets	
Equipment:	MALS, HIRLs, PAPI	☐ meets	

Additional Requirements			
Weather:	on-field, 24/7, data-linked	☑ meets	
Access to ATC Clearance:	RTR	☐ meets	
ADS-B Coverage:	On ground	☐ meets	

Overall Recommendations

GENERAL		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Weather Reporting Upgrade existing AWOS-III to include freezing rain sensor.	Improves information available to pilot.	$50,000
Communications Upgrade existing Ground Communication Outlet (GCO) to a Remote Transmitter / Receiver (RTR) directly with Potomac Approach.	Improves clearance delivery process. Provides direct communication with approach control. Used by aircraft on ground for obtaining or canceling IFR clearances.	$40,000
Communications Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	Improves pilot/controller communications and clearance delivery process.	Less than $5,000
Data link Provide ADS-B coverage while on the ground.	Provides traffic surveillance, terrain avoidance, weather data, etc. Crucial component for Next Generation Air Transportation System.	$100,000
Local Area Augmentation System (LAAS) Provide LAAS coverage to augment existing global positioning system.	Provides enhanced signal accuracy.	Unknown

RUNWAY 15 33		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Airfield Lighting Control Change control sequence and/or facility directory note for HIRLs to be preset on low intensity with higher intensity activated on CTAF.	Provides visibilty of landing environment during night and adverse weather conditions even during times of aircraft equipment failure or pilot control system malfunction.	Less than $10,000

Overall Recommendations

RUNWAY 15		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions (ground).	Standards.	Varies
Approach Lighting System Install MALS for Runway 15.	Improves pilot's ability to detect the landing environment.	$450,000
Visibility Minimum Upon installation of approach lighting system and subsequent acceptance of visibility credit, different design standards apply (less than 1 mile).	Lower landing visibility minimum.	$3,000,000
Aeronautical Survey Request / complete aeronautical survey to enable development of LNAV, LPV and RNP approach to Runway 15.	Provides survey data for instrument approach procedures.	$50,000
New Procedure Request development of RNAV (GPS) RWY 15 Approach with LPV and LNAV landing minimums.	Improve all-weather capability of the runway and airport and eliminate requirement for circle-to-land operations.	No equipment cost
New Procedure Request development of RNAV (RNP) RWY 15 Approach with LPV and LNAV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost

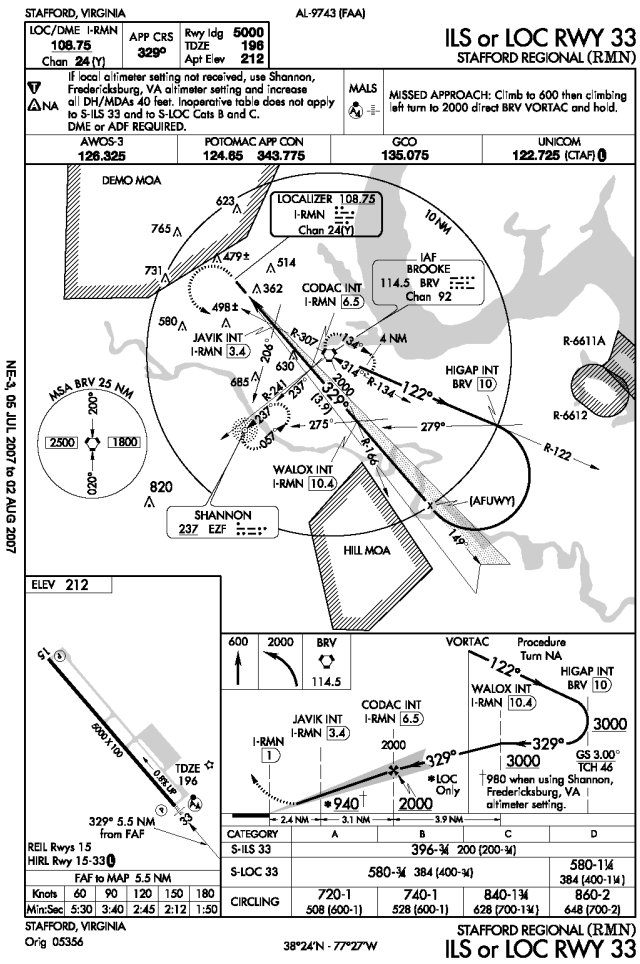
Overall Recommendations

RUNWAY 33		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions.	Standards.	Varies
Visibility Minimums Upon installation of approach lighting system, lower visibility minimums apply.	Lowers landing visibility minimum.	$1,650,000
Approach Lighting System Upgrade Runway 33 MALS to MALSR.	Improves pilot's ability to detect the landing environment.	$900,000
New Procedure Request development of RNAV (GPS) RWY 33 Approach with LPV and LNAV landing minimums.	Improve all-weather capability of the runway and airport and eliminate requirement for circle-to-land operations.	No equipment cost
New Procedure Request development of RNAV (RNP) RWY 33 Approach with LPV and LNAV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost

Stafford Regional (RMN)

Stafford, Virginia

Procedure Overview



ILS OR LOC RWY 33 - ILS

FAA PROCEDURE DATA	
Critical Obstacle:	**see note 1**
Required Obstacle Clearance:	
Remote Altimeter Adjustment:	
Accuracy Code Adjustment:	
Other Adjustment:	**see note 2**
Rounding Adjustment:	
Minimum Descent Altitude / Decision Height:	396

Note 1: ASC

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

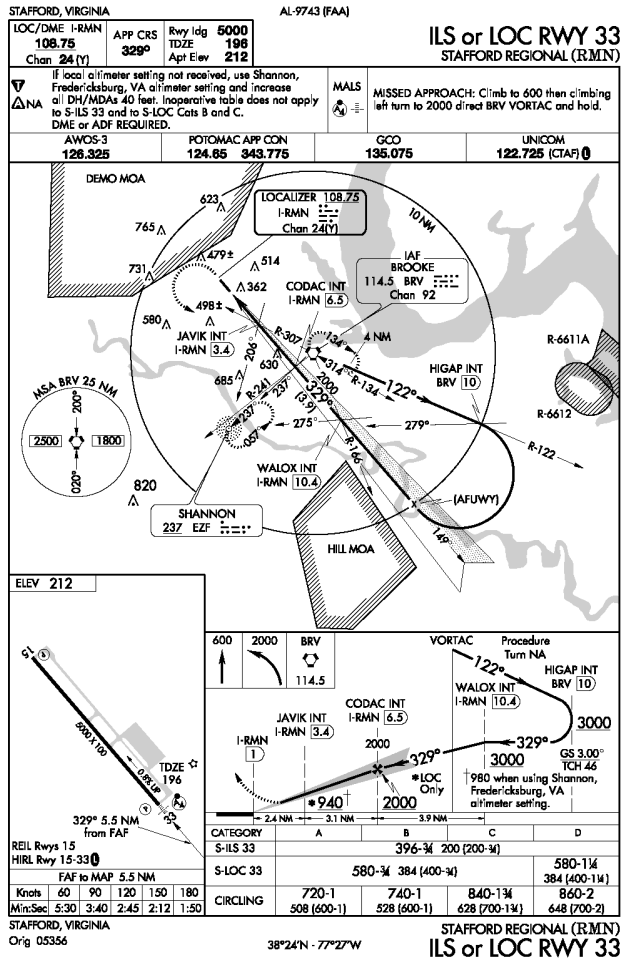
TABLE A16-1A - PRECISION INSTRUMENT APPROACH REQUIREMENTS

	<1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	4,200 ft (Paved)	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	Recommended	None
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 8, Criteria	Yes
Survey Required for Lowest Minima	Vertically Guided Survey	None

Stafford Regional (RMN)

Stafford, Virginia

Procedure Overview



ILS OR LOC RWY 33 - LOC

FAA PROCEDURE DATA		
Critical Obstacle:	329	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	1	
Minimum Descent Altitude / Decision Height:	580	

Note 1: 90' Tree

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

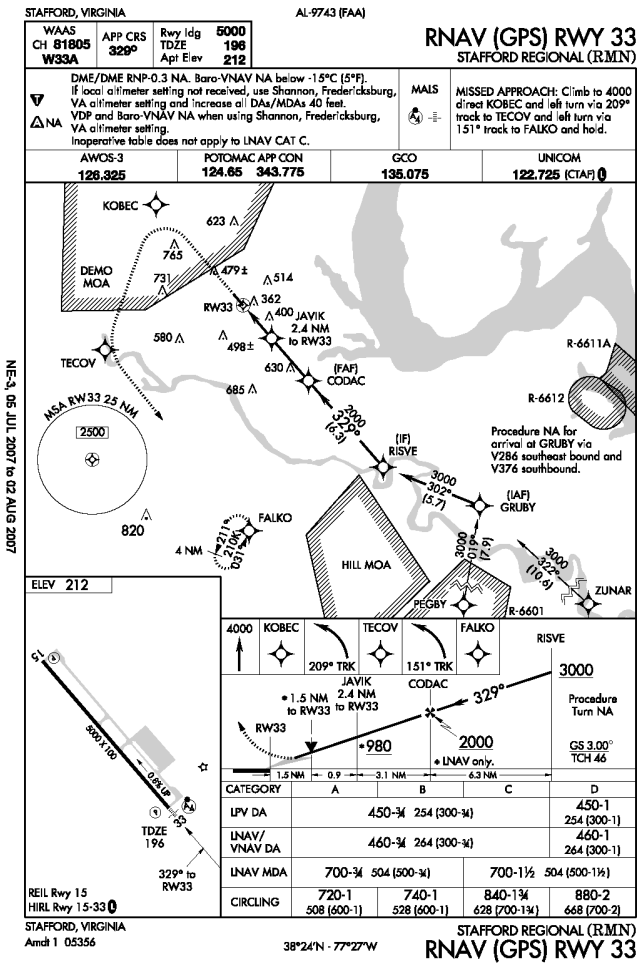
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	<1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft (Paved)	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	Required	None
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 8, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Stafford Regional (RMN)

Stafford, Virginia

Procedure Overview



RNAV (GPS) RWY 33 - LPV

FAA PROCEDURE DATA	
Critical Obstacle:	**see note 1**
Required Obstacle Clearance:	
Remote Altimeter Adjustment:	
Accuracy Code Adjustment:	
Other Adjustment:	**see note 2**
Rounding Adjustment:	
Minimum Descent Altitude / Decision Height:	450

Note 1: ASC

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

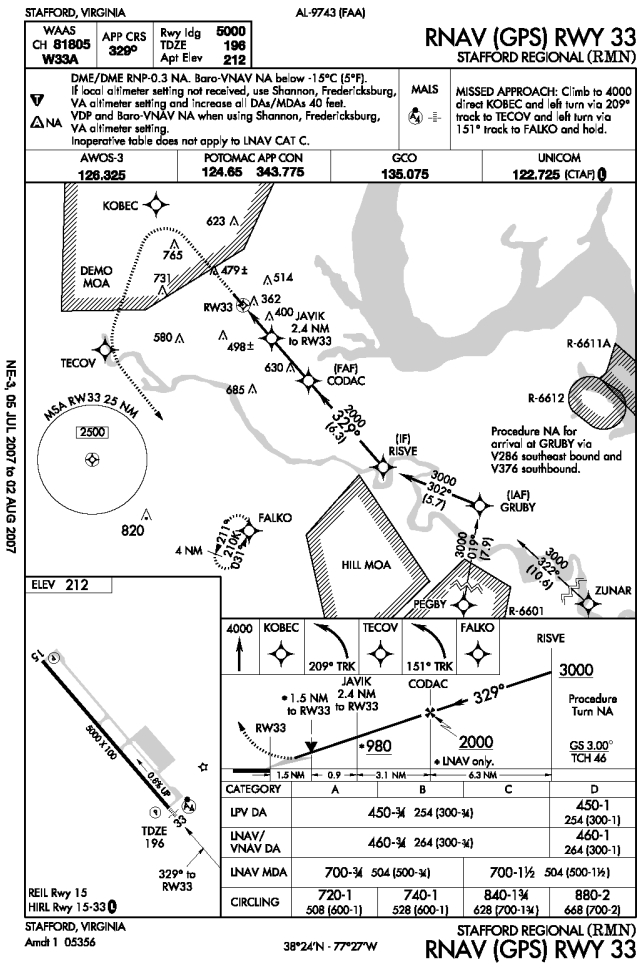
TABLE A16-1B - APPROACH PROCEDURE WITH VERTICAL GUIDANCE APPROACH REQUIREMENTS

	<1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft (Paved)	None
Runway Markings	Nonprecision (precision recommended)	None
Holding Position Signs and Markings	Nonprecision (precision recommended)	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	Required	None
Runway Design Standards	<3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 4 and 9, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Stafford Regional (RMN)

Stafford, Virginia

Procedure Overview



RNAV (GPS) RWY 33 - VNAV

FAA PROCEDURE DATA		
Critical Obstacle:	196	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	14	
Minimum Descent Altitude / Decision Height:	460	

Note 1: Road

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

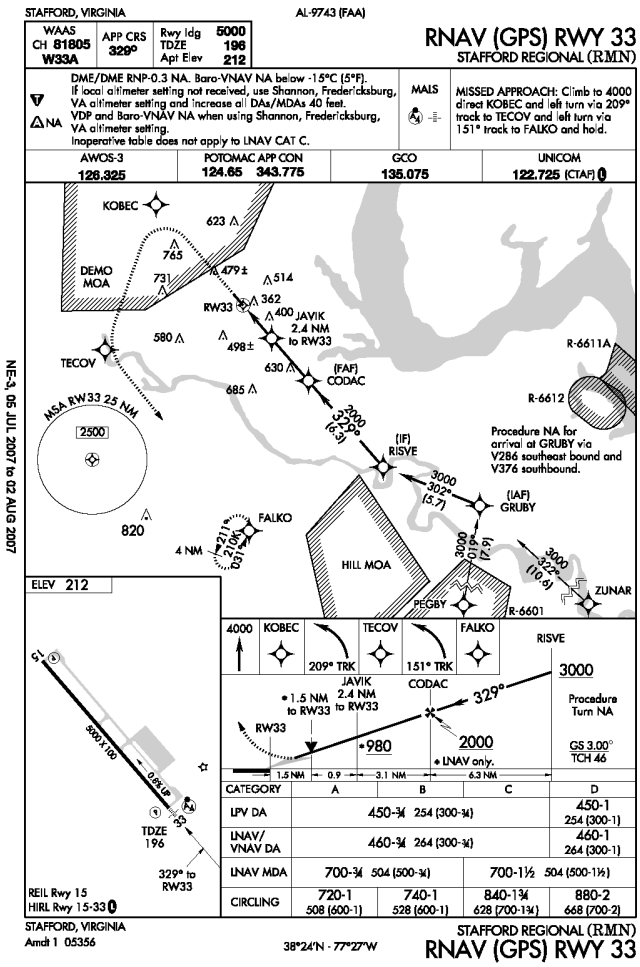
TABLE A16-1B - APPROACH PROCEDURE WITH VERTICAL GUIDANCE APPROACH REQUIREMENTS

	<1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft (Paved)	None
Runway Markings	Nonprecision (precision recommended)	None
Holding Position Signs and Markings	Nonprecision (precision recommended)	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	Required	None
Runway Design Standards	<3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 4 and 9, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Stafford Regional (RMN)

Stafford, Virginia

Procedure Overview



RNAV (GPS) RWY 33 - LNAV

FAA PROCEDURE DATA		
Critical Obstacle:	400	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:	50	
Other Adjustment:		**see note 2**
Rounding Adjustment:		
Minimum Descent Altitude / Decision Height:	700	

Note 1: Tower

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

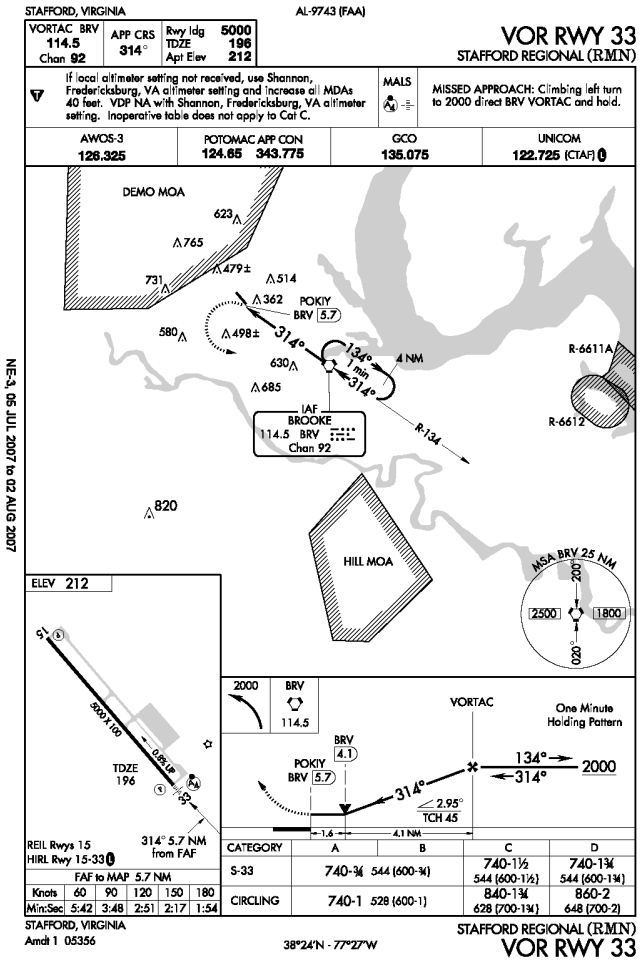
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	<1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft (Paved)	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	Required	None
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 8, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Stafford Regional (RMN)

Stafford, Virginia

Procedure Overview



VOR RWY 33

FAA PROCEDURE DATA		
Critical Obstacle:	359	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:	118	**see note 2**
Rounding Adjustment:	13	
Minimum Descent Altitude / Decision Height:	740	

Note 1: 90' Tree

Note 2: missed approach segment

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	<1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft (Paved)	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	Required	None
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 8, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Recommendations

ILS OR LOC RWY 33		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Procedure Review Request procedure be modified to eliminate ADF requirement.	Procedure simplification and improved reliability.	No equipment cost
Marker Beacon Install Marker Beacon at WALOX intersection.	Procedure clarity.	$50,000
Approach Lighting System Upgrade Runway 33 MALS to MALSR. See Overall Recommendations.	Lowers landing minimums to as low as 200 - 1/2.	$900,000 (duplicate)

RNAV (GPS) RWY 33		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Approach Lighting System Upgrade Runway 33 MALS to MALSR. See Overall Recommendations.	Lowers landing minimums to as low as 1/2 statute mile visibility.	$900,000 (duplicate)

Procedure Recommendations

VOR RWY 33		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Approach Lighting System Upgrade Runway 33 MALS to MALSR. See Overall Recommendations.	Lowers landing minimums to as low as 1/2 statute mile visibility.	$900,000 (duplicate)

Suffolk Executive (SFQ)

Suffolk, Virginia

AIRPORT INFORMATION	
ROLE / CLASSIFICATION INFORMATION	
VATSP Classfication (2008):	General Aviation Regional
NPIAS Role (2008):	General Aviation
Study Classification:	General Aviation Regional (3/4 mile visibility)

ACTIVITY INFORMATION	
Based Aircraft (2007):	85
Annual Operations (2020):	51720
Annual Enplanements (2020):	n/a

DEVELOPMENT INFORMATION (2008)	
Critical Airport Reference Code (Existing):	B-II
Critical Airport Reference Code (Proposed):	C-II
Airport Layout Plan (Original):	February, 2001
Airport Layout Plan (Revision):	n/a

Proposed Development (from ALD):

- Extend RWY 22 (500')
- Close RWY 7-25
- Install ILS (RWY 4)
- Install MALSR (RWY 4)
- Shift RWY 4-22 (600')

AERONAUTICAL SURVEY INFORMATION

Runway End	Survey Type	Survey Date
all	Photoslope	2006

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS	
Available Weather Reporting:	AWOS-III (PT)
Common Traffic Advisory Frequency:	122.7
Clearance Delivery:	GCO

Nearby Navigational Aids:

WALEY	NDB	249	RK	035°/ 5.5 NM TO FIELD
PORTSMOUTH	NDB	241	PVG	242°/ 9.5 NM TO FIELD
NORFOLK	VORTAC	116.9	ORF	244°/ 23.0 NM TO FIELD
FRANKLIN	VORTAC	110.6	FKN	105°/ 19.8 NM TO FIELD
COFIELD	VORTAC	114.6	CVI	044°/ 22.7 NM TO FIELD
CHESI	NDB	233	EY	304°/ 11.7 NM TO FIELD

Suffolk Executive (SFQ)

Suffolk, Virginia

Instrument Approach Procedure Summary

Minimums listed are Category B

EXISTING PROCEDURES		
RUNWAY 4		
LOC RWY 4	440 - 1 (373)	Amdt 2
RNAV (GPS) RWY 4 - LNAV	480 - 1 (413)	Amdt 1
RUNWAY 7		
RNAV (GPS) RWY 7 - LNAV	480 - 1 (408)	Orig

PROCEDURES PROPOSED AS PART OF STUDY
RNAV (GPS) RWY 22 - LNAV
RNAV (GPS) RWY 22 - LPV
RNAV (GPS) RWY 25 - LNAV
RNAV (GPS) RWY 4 - LPV

VISIBILITY CHANGES PROPOSED AS PART OF STUDY	
RUNWAY 4:	1 SM to 3/4 SM

REVIEWER COMMENTS

The Study recommends improving the LOC RWY 4 approach by aligning the approach with centerline, installing an approach lighting system (MALS) and installing distance measuring equipment. The Study recommends a reduction in landing visibility minimums. Additional information regarding the estimated impacts and costs associated with the visibility changes is included in Appendix E. The Airport Sponsor completed the requested informational survey.

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 4 22 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	B-II	C-II
Runway Dimensions (Length x Width in ft):	5007 x 100	5500 x 100
Runway to Taxiway Separation (feet):	partial	400
Runway Lighting:	HIRL	HIRL
RUNWAY 4		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 1010 x 1700	1000 x 1750 x 2500
Runway Markings:	Non-Precision	Precision
Available Visual Approach Aids:	PAPI; REILs	PAPI; MALSR
RUNWAY 22		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 700 x 1000	500 x 1010 x 1700
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	PAPI; REILs	PAPI; REILs
RUNWAY 7 25 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	B-II (small)	closed
Runway Dimensions (Length x Width in ft):	4700 x 100	closed
Runway to Taxiway Separation (feet):	partial	closed
Runway Lighting:	MIRL	closed
RUNWAY 7		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	250 x 450 x 1000	closed
Runway Markings:	Non-Precision	closed
Available Visual Approach Aids:	APAP	closed
RUNWAY 25		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	250 x 450 x 1000	closed
Runway Markings:	Visual	closed
Available Visual Approach Aids:	PINL	closed

Suffolk Executive (SFQ)

Suffolk, Virginia

System Benchmarks

General Aviation Regional (3/4 mile visibility)			
Best Approach (Primary Runway End)			
BENCHMARK		**RUNWAY 4**	
Approach:	Ground-based	☑ meets	LOC RWY 4
Ceiling:	400 AGL	☑ meets	
Visibility:	3/4 statute mile	☐ meets	
Approach:	LPV	☐ meets	RNAV (GPS) RWY 4 - LNAV
Ceiling:	250 AGL	☐ meets	
Visibility:	3/4 statute mile	☐ meets	
Equipment:	MALS, HIRLs, PAPI	☐ meets	existing HIRLs, PAPI
Secondary Approach (Different Runway End)			
BENCHMARK		**RUNWAY 7**	
Approach:	Ground-based	☐ meets	n/a (no ground-based approach available)
Ceiling:	400 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Approach:	LPV	☐ meets	RNAV (GPS) RWY 7 - LNAV
Ceiling:	250 AGL	☐ meets	
Visibility:	1 statute mile	☑ meets	
Equipment:	REILs, HIRLs, PAPI	☑ meets	
All Ends of Instrument Runways			
BENCHMARK		**RUNWAY 25**	
Approach:	none	☐ meets	n/a (no ground-based approach available)
Ceiling:		☐ meets	
Visibility:		☐ meets	
Approach:	LNAV	☐ meets	n/a (no satellite-based approach available)
Ceiling:	400 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Equipment:	REILs, MIRLs, PAPI	☐ meets	existing MIRLs

Suffolk Executive (SFQ)

Suffolk, Virginia

BENCHMARK		RUNWAY 22	
Approach:	none	☐ meets	n/a (no ground-based approach available)
Ceiling:		☐ meets	
Visibility:		☐ meets	
Approach:	LNAV	☐ meets	n/a (no satellite-based approach available)
Ceiling:	400 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Equipment:	REILs, MIRLs, PAPI	☑ meets	

Weather:	on-field, 24/7, data-linked	☑ meets	
Access to ATC Clearance:	RTR	☐ meets	
ADS-B Coverage:	On ground	☐ meets	

Overall Recommendations

GENERAL		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Weather Reporting Upgrade existing AWOS-III to include freezing rain sensor.	Improves information available to pilot.	$50,000
Communications Upgrade existing Ground Communication Outlet (GCO) to a Remote Transmitter / Receiver (RTR) directly with Norfolk Approach.	Improves clearance delivery process. Provides direct communication with approach control. Used by aircraft on ground for obtaining or canceling IFR clearances.	$40,000
Communications Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	Improves pilot/controller communications and clearance delivery process.	Less than $5,000
Data link Provide ADS-B coverage while on the ground.	Provides traffic surveillance, terrain avoidance, weather data, etc. Crucial component for Next Generation Air Transportation System.	$100,000
Local Area Augmentation System (LAAS) Provide LAAS coverage to augment existing global positioning system.	Provides enhanced signal accuracy.	Unknown

RUNWAY 4 22		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Airfield Lighting Control Change control sequence and/or facility directory note for HIRLs to be preset on low intensity with higher intensity activated on CTAF.	Provides visibilty of landing environment during night and adverse weather conditions even during times of aircraft equipment failure or pilot control system malfunction.	Less than $10,000

Overall Recommendations

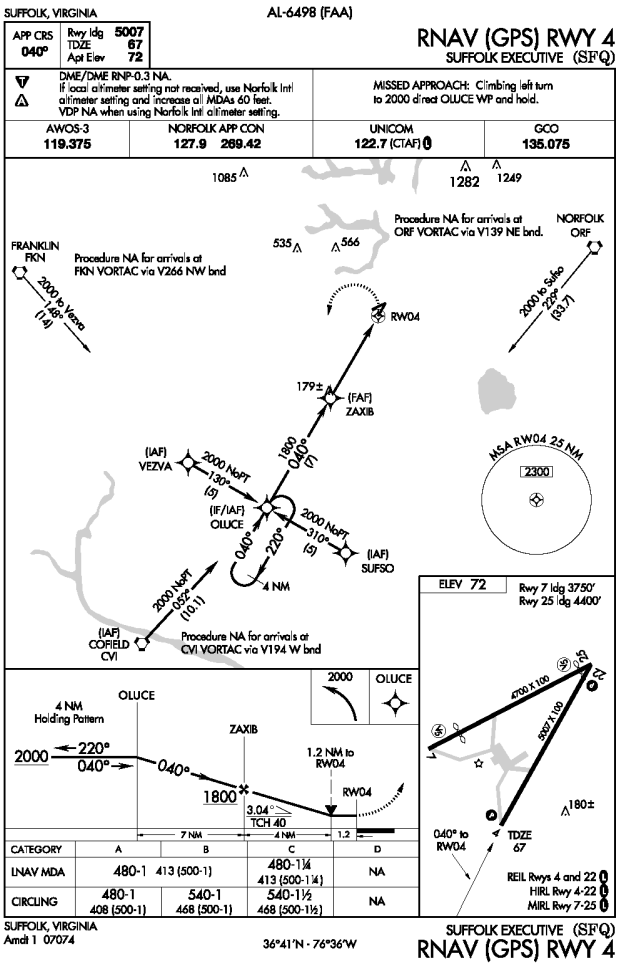
RUNWAY 4		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions.	Standards.	Varies
Approach Lighting System Install MALS for Runway 4.	Improves pilot's ability to detect the landing environment.	$450,000
Visibility Minimum Upon installation of approach lighting system and subsequent acceptance of visibility credit, different design standards apply (less than 1 mile).	Lower landing visibility minimum.	$2,120,000
Aeronautical Survey Request / complete aeronautical survey to enable development of LPV approach to Runway 4.	Provides survey data for instrument approach procedures.	$50,000
New Procedure Request development of RNAV (GPS) RWY 4 Approach with LPV landing minimums.	Improve all-weather capability of the runway and airport. LPV approach provides vertical guidance.	No equipment cost

RUNWAY 22		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions.	Standards.	Varies
Aeronautical Survey Request / complete aeronautical survey to enable development of LNAV and LPV approaches to Runway 22.	Provides survey data for instrument approach procedures.	$50,000 (duplicate)
New Procedure Request development of RNAV (GPS) RWY 22 Approach with LPV and LNAV landing minimums.	Improve all-weather capability of the runway and airport and eliminate requirement for circle-to-land operations. LPV approach provides vertical guidance.	No equipment cost

Overall Recommendations

RUNWAY 25		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Aeronautical Survey Request / complete aeronautical survey to enable development of LNAV approaches to Runway 25.		$50,000 (duplicate)
New Procedure Request development of RNAV (GPS) RWY 25 Approach with LNAV landing minimums.		No equipment cost

Procedure Overview



RNAV (GPS) RWY 4 - LNAV

FAA PROCEDURE DATA		
Critical Obstacle:	179	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:	51	**see note 2**
Rounding Adjustment:		
Minimum Descent Altitude / Decision Height:	480	

Note 1: 100' Trees

Note 2: AT

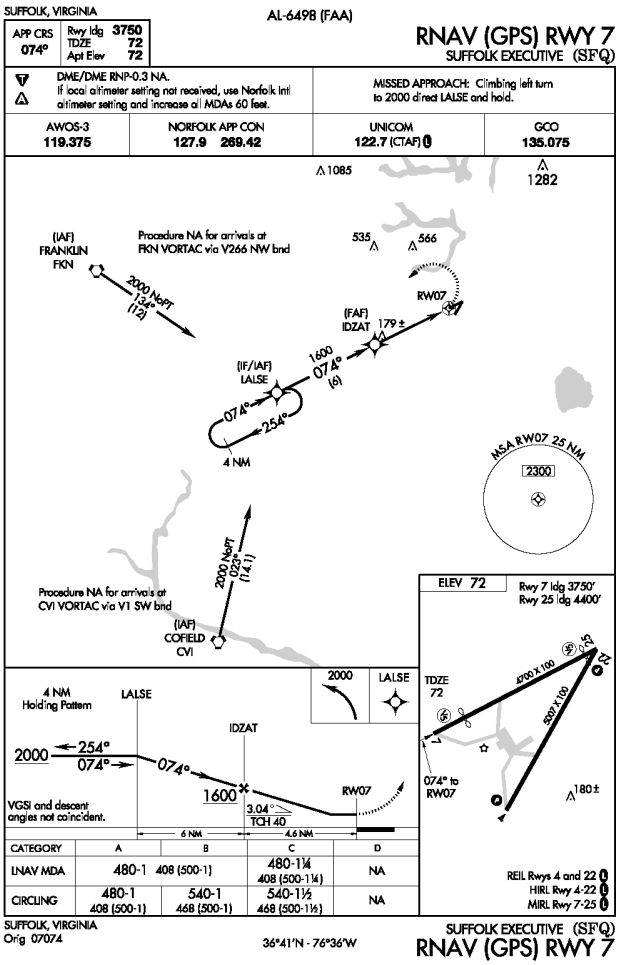
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	Yes
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Overview



RNAV (GPS) RWY 7 - LNAV

FAA PROCEDURE DATA		
Critical Obstacle:	179	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:	51	**see note 2**
Rounding Adjustment:		
Minimum Descent Altitude / Decision Height:	480	

Note 1: 100' Trees

Note 2: AT

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

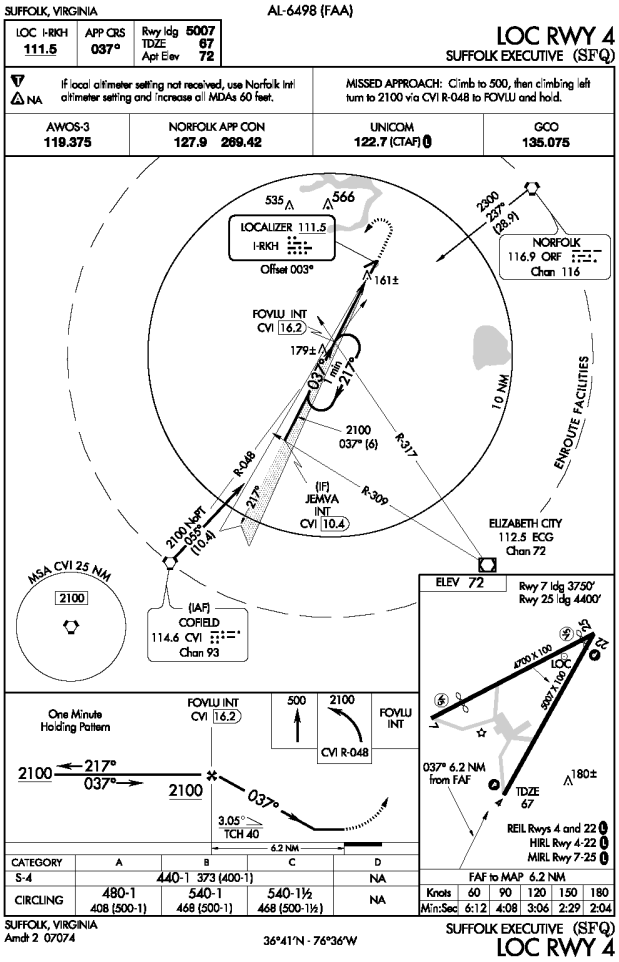
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	Yes
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Suffolk Executive (SFQ)

Suffolk, Virginia

Procedure Overview



LOC RWY 4

FAA PROCEDURE DATA		
Critical Obstacle:	179	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	11	
Minimum Descent Altitude / Decision Height:	440	

Note 1: 100' Trees

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	1 SM	**KNOWN DEFICIENCIES**
	REQUIRED	
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	Yes
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Recommendations

RNAV (GPS) RWY 4		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Procedure Review Request FAA re-evaluate air traffic adjustment of 51 feet.	Minimum Descent Altitude (MDA) may be reduced by as much as 40 to 60 feet.	No equipment cost
Procedure Review (Approach Category) Request addition of Approach Category D minimums to the procedure.	Improves accessibility of the airport.	No equipment cost

RNAV (GPS) RWY 7		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Procedure Review Request FAA re-evaluate air traffic adjustment of 51 feet.	Minimum Descent Altitude (MDA) may be reduced by as much as 40 to 60 feet.	No equipment cost
Procedure Review (Approach Category) Request addition of Approach Category D minimums to the procedure.	Improves accessibility of the airport.	No equipment cost

Procedure Recommendations

LOC RWY 4		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Localizer Relocate localizer to allow for approach on centerline.	Improves pilot's ability to detect landing environment. Standards.	$100,000
Distance Measuring Equipment Install Distance Measuring Equipment (DME). Co-locate with the localizer.	Improves pilot's situational awareness. Preferred method to establish the final approach fix.	$100,000
Approach Lighting System Install MALS for Runway 4. See Overall Recommendations.	Lowers landing visibility minimum to as low as 3/4 statute mile.	$450,000 (duplicate)
Visibility Minimum Upon installation of approach lighting system, request procedure be updated to 3/4 statute mile visibility.	Lower landing visibility minimum.	See Overall Recommendations
Procedure Review (Approach Category) Request addition of Approach Category D minimums to the procedure.	Improves accessibility of the airport.	No equipment cost

Tangier Island (TGI)

Tangier, Virginia

AIRPORT INFORMATION	
ROLE / CLASSIFICATION INFORMATION	
VATSP Classfication (2008):	General Aviation Community
NPIAS Role (2008):	General Aviation
Study Classification:	General Aviation Community

ACTIVITY INFORMATION	
Based Aircraft (2007):	0
Annual Operations (2020):	1000
Annual Enplanements (2020):	n/a

DEVELOPMENT INFORMATION (2008)	
Critical Airport Reference Code (Existing):	B-I (small)
Critical Airport Reference Code (Proposed):	B-I (small)
Airport Layout Plan (Original):	April, 2006
Airport Layout Plan (Revision):	n/a

Proposed Development (from ALD):
- Shorten RWY (524')

AERONAUTICAL SURVEY INFORMATION

Runway End	Survey Type	Survey Date
all	Photoslope	2006

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS	
Available Weather Reporting:	None
Common Traffic Advisory Frequency:	122.8
Clearance Delivery:	Phone

Nearby Navigational Aids:

SNOW HILL	VORTAC	112.4	SWL	249°/ 28.8 NM TO FIELD
CAPE CHARLES	VORTAC	112.2	CCV	010°/ 28.7 NM TO FIELD

Tangier Island (TGI)

Tangier, Virginia

Instrument Approach Procedure Summary

Minimums listed are Category B

EXISTING PROCEDURES		
RUNWAY 2		
VOR/DME OR GPS RWY 2	720 - 1 (713)	Orig C

PROCEDURES PROPOSED AS PART OF STUDY
RNAV (GPS) RWY 2 - LNAV
RNAV (GPS) RWY 2 - LPV
RNAV (GPS) RWY 20 - LNAV

VISIBILITY CHANGES PROPOSED AS PART OF STUDY	
none	

REVIEWER COMMENTS

The Airport Sponsor completed the requested informational survey.

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 2 20 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	B-I (small)	B-I (small)
Runway Dimensions (Length x Width in ft):	2950 x 75	2426 x 75
Runway to Taxiway Separation (feet):	none	none
Runway Lighting:	none	none
RUNWAY 2		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	250 x 450 x 1000	250 x 450 x 1000
Runway Markings:	Non-Precision	Visual
Available Visual Approach Aids:	none	none
RUNWAY 20		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	250 x 450 x 1000	250 x 450 x 1000
Runway Markings:	Non-Precision	Visual
Available Visual Approach Aids:	none	none

Tangier Island (TGI)

Tangier, Virginia

System Benchmarks

General Aviation Community			
Best Approach (Primary Runway End)			
BENCHMARK		**RUNWAY 2**	
Approach:	Ground-based	☑ meets	VOR/DME OR GPS RWY 2
Ceiling:	500 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Approach:	LNAV	☐ meets	VOR/DME OR GPS RWY 2
Ceiling:	400 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Equipment:	REILs, MIRLs, PAPI	☐ meets	existing MIRLs out of service
Secondary Approach (Different Runway End)			
BENCHMARK		**RUNWAY 20**	
Approach:		☐ meets	n/a (no ground-based approach available)
Ceiling:		☐ meets	
Visibility:		☐ meets	
Approach:	LNAV	☐ meets	n/a (no satellite-based approach available)
Ceiling:	500 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Equipment:	REILs, MIRLs, PAPI	☐ meets	existing MIRLs out of service

Additional Requirements			
Weather:	Normally on-field, 24/7, data-linked	☐ meets	
Access to ATC Clearance:	RTR or GCO	☐ meets	
ADS-B Coverage:	1000 AGL	☐ meets	

Overall Recommendations

GENERAL		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Altimeter Source / Weather Reporting Install AWOS-III.	Provides local altimeter source and weather reporting.	$150,000
Communications Install a Ground Communication Outlet (GCO) directly with Patuxent Approach.	Provides direct communication with approach control via radio and an "on-demand" telephone land line link. Used by aircraft on ground for obtaining or canceling IFR clearances.	$20,000
Radar Coverage Request commissioning of Wallops ASR Radar.	Improved service.	Unknown
Communications Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	Improves pilot/controller communications and clearance delivery process.	Less than $5,000
Data link Provide ADS-B coverage at 1000 AGL or lower.	Provides traffic surveillance, terrain avoidance, weather data, etc. Crucial component for Next Generation Air Transportation System.	Unknown

RUNWAY 2 20		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Runway Lighting Install Medium Intensity Runway Lights (MIRLs).	Improves pilot's ability to detect the runway environment.	$125,000

Overall Recommendations

RUNWAY 2		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions (pole).	Standards.	Varies
Runway End Identifier Lights Install REILs for Runway 2.	Improves pilot's ability to detect the landing environment.	$50,000
Precision Approach Path Indicator Install 4-box PAPI for Runway 2.	Provides visual vertical descent guidance information during the approach to the runway.	$70,000
Aeronautical Survey Request / complete aeronautical survey to enable development of LNAV and LPV approaches to Runway 2.	Provides survey data for instrument approach procedures.	$50,000
New Procedure Request development of RNAV (GPS) RWY 2 Approach with LPV and LNAV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost

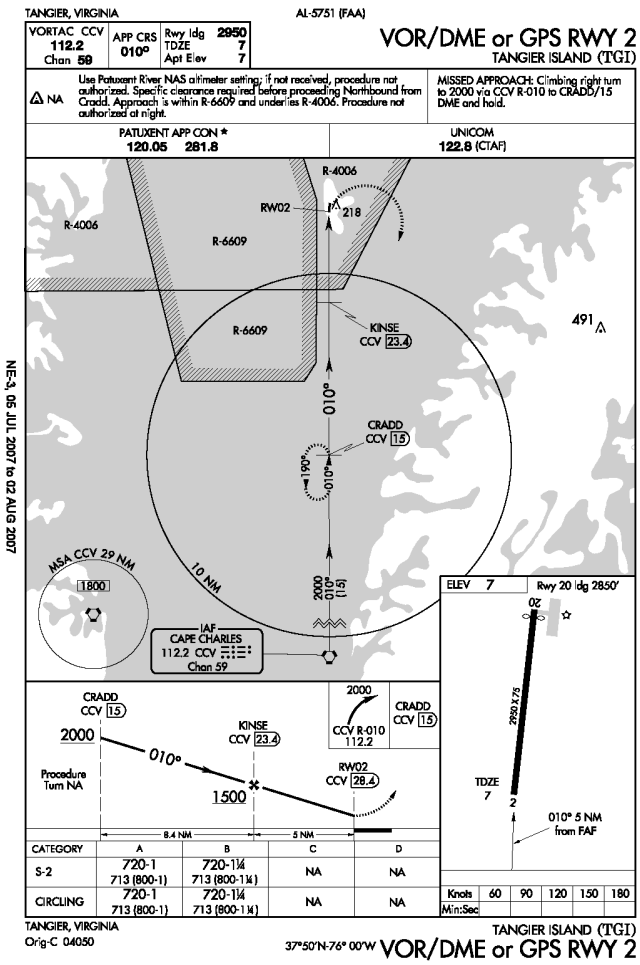
Overall Recommendations

RUNWAY 20		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Runway End Identifier Lights Install REILs for Runway 20.	Improves pilot's ability to detect the landing environment.	$50,000
Precision Approach Path Indicator Install 4-box PAPI for Runway 20.	Provides visual vertical descent guidance information during the approach to the runway.	$70,000
Aeronautical Survey Request / complete aeronautical survey to enable development of LNAV approach to Runway 20.	Provides survey data for instrument approach procedures.	$50,000 (duplicate)
New Procedure Request development of RNAV (GPS) RWY 20 Approach with LNAV landing minimums.	Improve all-weather capability of the runway and airport and eliminate requirement for circle-to-land operations.	No equipment cost

Tangier Island (TGI)

Tangier, Virginia

Procedure Overview



VOR/DME OR GPS RWY 2

FAA PROCEDURE DATA		
Critical Obstacle:	218	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:	222	
Accuracy Code Adjustment:	50	
Other Adjustment:	-20	**see note 2**
Rounding Adjustment:	0	
Minimum Descent Altitude / Decision Height:	720	

Note 1: TWR 47-0335

Note 2: unknown

Note 3:

NE-3, 05 JUL 2007 to 02 AUG 2007

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	Yes
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	Yes
Parallel Taxiway	Recommended	Yes
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Recommendations

VOR / DME OR GPS RWY 2		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Altimeter Source / Weather Reporting Install AWOS-III and request FAA re-evaluation of remote altimeter setting source penalty. See Overall Recommendations.	Minimum Descent Altitude (MDA) may be reduced by 220 to 240 feet by eliminating the remote altimeter setting source (RASS) adjustment.	$150,000 (duplicate)
Critical Obstacle Field verify critical obstacle to change accuracy code from "D" to "A" or 50 feet to 3 feet.	Minimum Descent Altitude (MDA) may be reduced by 40 to 60 feet.	Less than $10,000
Procedure Review Request procedure be updated to separate GPS approach from ground-based approach.	Procedure clarity.	No equipment cost
Procedure Review Request procedure be updated to increase line weight of final approach course and diagram.	Standards. Procedure clarity.	No equipment cost

Tappahannock-Essex County (XSA)

Tappahannock, Virginia

AIRPORT INFORMATION	
ROLE / CLASSIFICATION INFORMATION	
VATSP Classfication (2008):	General Aviation Regional
NPIAS Role (2008):	General Aviation
Study Classification:	General Aviation Regional (1 mile visibility)

ACTIVITY INFORMATION	
Based Aircraft (2007):	13
Annual Operations (2020):	14359
Annual Enplanements (2020):	n/a

DEVELOPMENT INFORMATION (2008)	
Critical Airport Reference Code (Existing):	B-I
Critical Airport Reference Code (Proposed):	B-II
Airport Layout Plan (Original):	April, 1998
Airport Layout Plan (Revision):	n/a

Proposed Development (from ALD):
- Extend RWY 10 (1100')
- Upgrade to B-II
- Install LOC (RWY 10)
- Construct parallel taxiway

AERONAUTICAL SURVEY INFORMATION

Runway End	Survey Type	Survey Date
28	PIR	2007
10	PIR	2007

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS	
Available Weather Reporting:	AWOS-III (P)
Common Traffic Advisory Frequency:	122.8
Clearance Delivery:	Phone

Nearby Navigational Aids:

RICHMOND	VORTAC	114.1	RIC	052° / 29.5 NM TO FIELD
HARCUM	VORTAC	108.8	HCM	348° / 26.1 NM TO FIELD

Tappahannock-Essex County (XSA)

Tappahannock, Virginia

Instrument Approach Procedure Summary

Minimums listed are Category B

EXISTING PROCEDURES		
RUNWAY 10		
RNAV(GPS) RWY 10 - LNAV	640 - 1 (640)	Orig
RUNWAY 28		
RNAV(GPS) RWY 28 - LNAV	600 - 1 (600)	Orig

PROCEDURES PROPOSED AS PART OF STUDY
LOC RWY 28
RNAV (GPS) RWY 10 - LPV
RNAV (GPS) RWY 28 - LPV

VISIBILITY CHANGES PROPOSED AS PART OF STUDY	
none	

REVIEWER COMMENTS

The airport does not currently have any ground-based approaches. A LOC RWY 28 procedure is recommended for development.

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 10 28 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	B-II	B-II
Runway Dimensions (Length x Width in ft):	4300 x 75	5400 x 75
Runway to Taxiway Separation (feet):	partial	300
Runway Lighting:	MIRL	MIRL
RUNWAY 10		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 700 x 1000	500 x 700 x 1000
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	PAPI; REILs	PAPI; REILs
RUNWAY 28		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	250 x 450 x 1000	500 x 700 x 1000
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	PAPI; REILs	PAPI; REILs

Tappahannock-Essex County (XSA)

Tappahannock, Virginia

System Benchmarks

General Aviation Regional (1 mile visibility)			
Best Approach (Primary Runway End)			
BENCHMARK		**RUNWAY 28**	
Approach:	Ground-based	☐ meets	n/a (no ground-based approach available)
Ceiling:	400 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Approach:	LPV	☐ meets	RNAV(GPS) RWY 28 - LNAV
Ceiling:	250 AGL	☐ meets	
Visibility:	1 statute mile	☑ meets	
Equipment:	REILs (or approach lights), MIRLs, PAPI	☑ meets	
Secondary Approach (Different Runway End)			
BENCHMARK		**RUNWAY 10**	
Approach:		☐ meets	n/a (no ground-based approach available)
Ceiling:		☐ meets	
Visibility:		☐ meets	
Approach:	LNAV	☑ meets	RNAV(GPS) RWY 10 - LNAV
Ceiling:	400 AGL	☐ meets	
Visibility:	1 statute mile	☑ meets	
Equipment:	REILs, MIRLs, PAPI	☑ meets	

Additional Requirements			
Weather:	on-field, 24/7, data-linked	☑ meets	
Access to ATC Clearance:	RTR or GCO	☐ meets	
ADS-B Coverage:	On ground	☐ meets	

Overall Recommendations

GENERAL		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Communications Install a Ground Communication Outlet (GCO) directly with Potomac Approach.	Provides direct communication with approach control via radio and an "on-demand" telephone land line link. Used by aircraft on ground for obtaining or canceling IFR clearances.	$20,000
Communications Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	Improves pilot/controller communications and clearance delivery process.	Less than $5,000
Data link Provide ADS-B coverage while on the ground.	Provides traffic surveillance, terrain avoidance, weather data, etc. Crucial component for Next Generation Air Transportation System.	$100,000

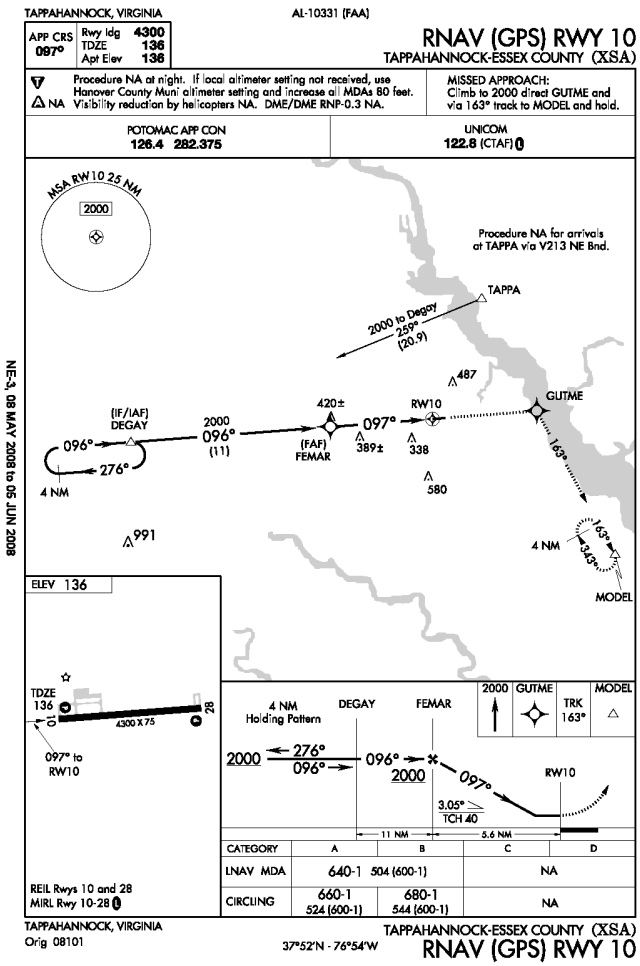
RUNWAY 10		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
New Procedure Request development of RNAV (GPS) RWY 10 approach with LPV landing minimums.	Improves all-weather capability of the runway and airport and provides vertical guidance.	No equipment cost

RUNWAY 28		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
New Procedure Install localizer and request development of LOC RWY 28 approach.	Provides a straight-in, ground-based approach. May support minimums as low as 500-1 (370) with a reduction in minimums of 100 feet.	$200,000
Distance Measuring Equipment Install Distance Measuring Equipment (DME) in conjunction with localizer.	Improves pilot's situational awareness and can simplify procedures.	$100,000
New Procedure Request development of RNAV (GPS) RWY 28 approach with LPV landing minimums.	Improves all-weather capability of the runway and airport and provides vertical guidance.	No equipment cost

Tappahannock-Essex County (XSA)

Tappahannock, Virginia

Procedure Overview



RNAV(GPS) RWY 10 - LNAV

FAA PROCEDURE DATA		
Critical Obstacle:	389	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	1	
Minimum Descent Altitude / Decision Height:	640	

Note 1: AAO

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

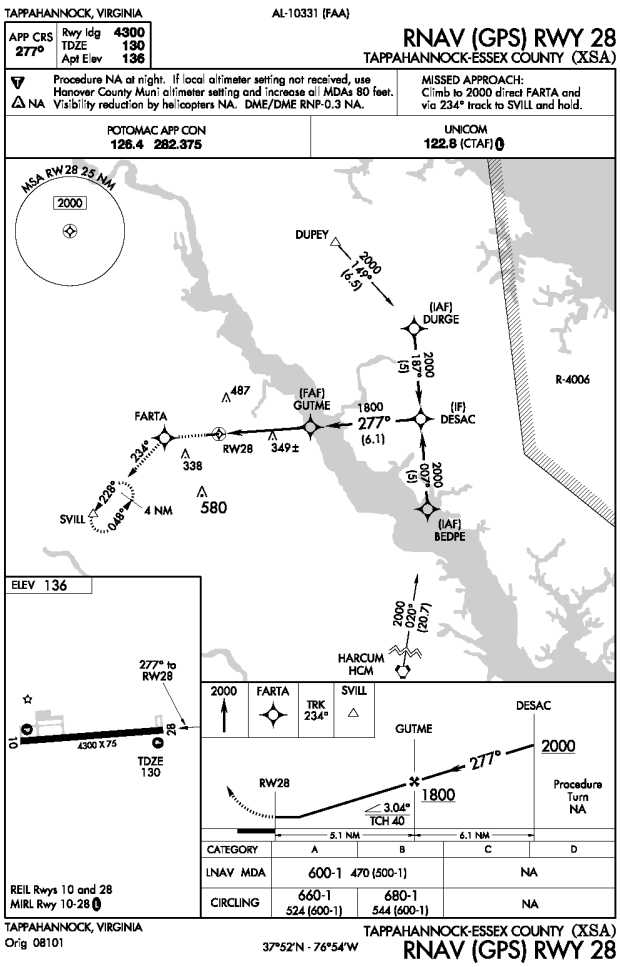
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Tappahannock-Essex County (XSA)

Tappahannock, Virginia

Procedure Overview



RNAV(GPS) RWY 28 - LNAV

FAA PROCEDURE DATA		
Critical Obstacle:	349	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	1	
Minimum Descent Altitude / Decision Height:	600	

Note 1: AAO

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM REQUIRED	KNOWN DEFICIENCIES
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	Yes
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Recommendations

RNAV (GPS) RWY 10		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Procedure Review Request re-evaluation of procedure with recent aeronautical survey information to review AAO.	May lower MDA by as much as 100 feet.	No equipment cost
Procedure Review (Approach Category) Request addition of Approach Category C and D minimums to the procedure.	Improves accessibility of the airport.	No equipment cost

RNAV (GPS) RWY 28		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Procedure Review Request re-evaluation of procedure with recent aeronautical survey information to review AAO.	May lower MDA by as much as 100 feet.	No equipment cost
Procedure Review (Approach Category) Request addition of Approach Category C and D minimums to the procedure.	Improves accessibility of the airport.	No equipment cost

Tazewell County (6V3)

Richlands, Virginia

AIRPORT INFORMATION	
ROLE / CLASSIFICATION INFORMATION	
VATSP Classfication (2008):	General Aviation Regional
NPIAS Role (2008):	General Aviation
Study Classification:	General Aviation Regional (1 mile visibility)

ACTIVITY INFORMATION	
Based Aircraft (2007):	9
Annual Operations (2020):	5515
Annual Enplanements (2020):	n/a

DEVELOPMENT INFORMATION (2008)	
Critical Airport Reference Code (Existing):	B-I (small)
Critical Airport Reference Code (Proposed):	B-II
Airport Layout Plan (Original):	November, 1996
Airport Layout Plan (Revision):	n/a

Proposed Development (from ALD):
- Extend RWY 25 (700')
- Upgrade to B-II
- Upgrade RWY 7 RPZ
- Upgrade RWY 25 RPZ

AERONAUTICAL SURVEY INFORMATION

Runway End	Survey Type	Survey Date
all	Photoslope	2001
all		incl. in Study

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS	
Available Weather Reporting:	AWOS-III
Common Traffic Advisory Frequency:	123.05
Clearance Delivery:	GCO

Nearby Navigational Aids:

GLADE SPRING	VOR/DME	110.2	GZG	045°/ 19.7 NM TO FIELD

Tazewell County (6V3)

Richlands, Virginia

Instrument Approach Procedure Summary

Minimums listed are Category B

EXISTING PROCEDURES		
RUNWAY 25		
RNAV (GPS) RWY 25 - LNAV	3160 - 1 (507)	Orig

PROCEDURES PROPOSED AS PART OF STUDY
LOC RWY 25
RNAV (GPS) RWY 25 - LPV
RNAV (GPS) RWY 7 - LNAV
RNAV (GPS) RWY 7 - LPV

VISIBILITY CHANGES PROPOSED AS PART OF STUDY	
none	

REVIEWER COMMENTS

The airport does not currently have any vertically-guided or ground-based approaches. A ground-based approach (LOC RWY 25) is under construction / development.

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 7 25 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	B-I (small)	B-II
Runway Dimensions (Length x Width in ft):	4300 x 75	5000 x 75
Runway to Taxiway Separation (feet):	none	none
Runway Lighting:	MIRL	MIRL
RUNWAY 7		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	250 x 450 x 1000	500 x 700 x 1000
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	PAPI; REILs	PAPI; REILs
RUNWAY 25		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	250 x 450 x 1000	500 x 700 x 1000
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	PAPI; REILs	PAPI; REILs

Tazewell County (6V3)

Richlands, Virginia

System Benchmarks

General Aviation Regional (1 mile visibility)			
Best Approach (Primary Runway End)			
BENCHMARK		**RUNWAY 25**	
Approach:	Ground-based	☐ meets	n/a (no ground-based approach available)
Ceiling:	400 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Approach:	LPV	☐ meets	RNAV (GPS) RWY 25 - LNAV
Ceiling:	250 AGL	☐ meets	
Visibility:	1 statute mile	☑ meets	
Equipment:	REILs (or approach lights), MIRLs, PAPI	☑ meets	
Secondary Approach (Different Runway End)			
BENCHMARK		**RUNWAY 7**	
Approach:		☐ meets	n/a (no ground-based approach available)
Ceiling:		☐ meets	
Visibility:		☐ meets	
Approach:	LNAV	☐ meets	n/a (no satellite-based approach available)
Ceiling:	400 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Equipment:	REILs, MIRLs, PAPI	☑ meets	

Additional Requirements			
Weather:	on-field, 24/7, data-linked	☑ meets	
Access to ATC Clearance:	RTR or GCO	☑ meets	
ADS-B Coverage:	On ground	☐ meets	

Overall Recommendations

GENERAL		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Airport Identifier Update airport identifier to three letter format.	Consistency.	No equipment cost
Weather Reporting Upgrade existing AWOS-III to include present weather, lightning and freezing rain sensor.	Improves information available to pilot.	$60,000
Communications Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	Improves pilot/controller communications and clearance delivery process.	Less than $5,000
Data link Provide ADS-B coverage while on the ground.	Provides traffic surveillance, terrain avoidance, weather data, etc. Crucial component for Next Generation Air Transportation System.	$100,000

RUNWAY 7		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions (trees).	Standards.	Varies
Precision Approach Path Indicator Implement standard glidepath angle (3.0 degrees) with removal of obstructions.	Provides standardized approach path.	$5,000
Aeronautical Survey Request / complete aeronautical survey to enable development of LNAV and LPV approaches to Runway 7.	Provides survey data for instrument approach procedures.	Underway as part of Study
New Procedure Request development of RNAV (GPS) RWY 7 Approach with LNAV and LPV landing minimums.	Improve all-weather capability of the runway and airport and eliminate requirement for circle-to-land operations. Minimums as low as 3210-1 (467) may be obtained for a reduction of 100 feet.	No equipment cost

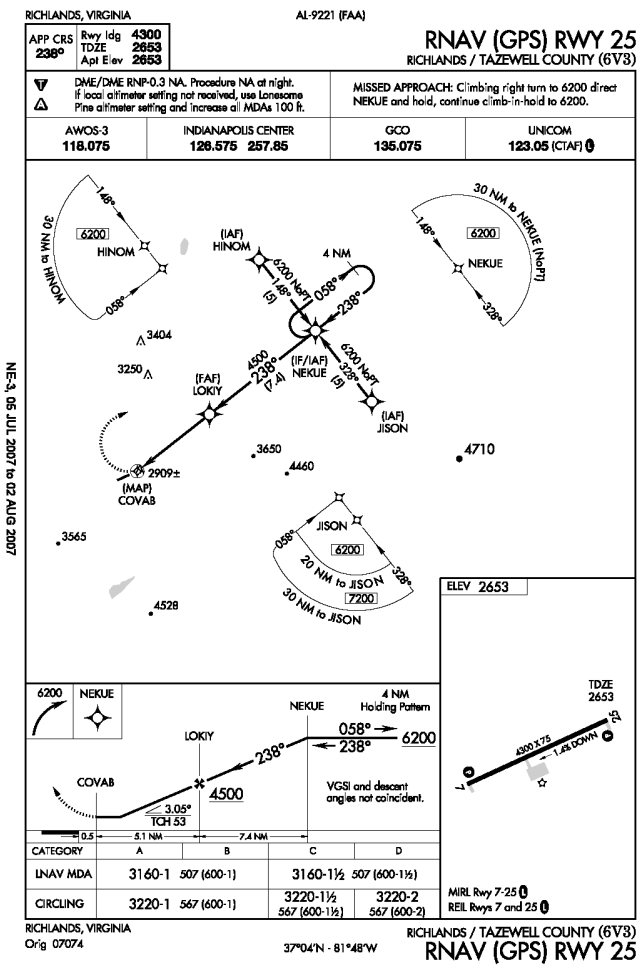
Overall Recommendations

RUNWAY 25		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
New Procedure Install localizer and request development of LOC RWY 25 approach.	Provides a straight-in, ground-based approach.	Underway
Distance Measuring Equipment Install Distance Measuring Equipment (DME) in conjunction with localizer.	Improves pilots' situational awareness and can simplify procedures.	$100,000
Aeronautical Survey Request / complete aeronautical survey to enable development of LPV approach to Runway 25.	Provides survey data for instrument approach procedures.	Underway as part of Study
New Procedure Request development of RNAV (GPS) RWY 25 Approach with LPV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost

Tazewell County (6V3)

Richlands, Virginia

Procedure Overview



RNAV (GPS) RWY 25 - LNAV

FAA PROCEDURE DATA		
Critical Obstacle:	2909	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	1	
Minimum Descent Altitude / Decision Height:	3160	

Note 1: 70' Tree

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	1 SM	**KNOWN DEFICIENCIES**
	REQUIRED	
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	Yes
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Recommendations

RNAV (GPS) RWY 25		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a

Twin County (HLX)

Galax-Hillsville, Virginia

AIRPORT INFORMATION	
ROLE / CLASSIFICATION INFORMATION	
VATSP Classfication (2008):	General Aviation Community
NPIAS Role (2008):	General Aviation
Study Classification:	General Aviation Community

ACTIVITY INFORMATION	
Based Aircraft (2007):	12
Annual Operations (2020):	12084
Annual Enplanements (2020):	n/a
DEVELOPMENT INFORMATION (2008)	
Critical Airport Reference Code (Existing):	B-II
Critical Airport Reference Code (Proposed):	B-II
Airport Layout Plan (Original):	January, 2007
Airport Layout Plan (Revision):	n/a

Proposed Development (from ALD):
- Extend RWY 19 (800')
- Complete parallel taxiway

AERONAUTICAL SURVEY INFORMATION

Runway End	Survey Type	Survey Date
all	Photoslope	2006

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS	
Available Weather Reporting:	AWOS-III
Common Traffic Advisory Frequency:	122.8
Clearance Delivery:	GCO

Nearby Navigational Aids:

PULASKI	VORTAC	116.8	PSK	201°/ 20 NM TO FIELD
HILLSVILLE	NDB	269	HLZ	AT FIELD

Twin County (HLX)

Galax-Hillsville, Virginia

Instrument Approach Procedure Summary

Minimums listed are Category B

EXISTING PROCEDURES		
CIRCLING		
NDB-A	3480 - 1 (787)	Amdt 6
RUNWAY 1		
RNAV (GPS) RWY 1 - LNAV	3140 - 1 (447)	Orig
RUNWAY 19		
RNAV (GPS) RWY 19 - LNAV	3140 - 1 (454)	Orig

PROCEDURES PROPOSED AS PART OF STUDY
RNAV (GPS) RWY 1 - LPV
VOR/DME RWY 19

VISIBILITY CHANGES PROPOSED AS PART OF STUDY	
none	

REVIEWER COMMENTS

Although the minimums do not meet the System Benchmarks, the airport has the recommended approaches for a General Aviation Community airport. The Airport Sponsor completed the requested informational survey.

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 1 19 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	B-II	B-II
Runway Dimensions (Length x Width in ft):	4204 x 75	5004 x 75
Runway to Taxiway Separation (feet):	240	240
Runway Lighting:	MIRL	MIRL
RUNWAY 1		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 700 x 1000	500 x 700 x 1000
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	PAPI; REILs	PAPI; REILs
RUNWAY 19		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 700 x 1000	500 x 700 x 1000
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	PAPI; REILs	PAPI; REILs

Twin County (HLX)

Galax-Hillsville, Virginia

System Benchmarks

General Aviation Community			
Best Approach (Primary Runway End)			
BENCHMARK		**RUNWAY 1**	
Approach:	Ground-based	☑ meets	NDB-A
Ceiling:	500 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Approach:	LNAV	☑ meets	RNAV (GPS) RWY 1 - LNAV
Ceiling:	400 AGL	☐ meets	
Visibility:	1 statute mile	☑ meets	
Equipment:	REILs, MIRLs, PAPI	☑ meets	
Secondary Approach (Different Runway End)			
BENCHMARK		**RUNWAY 19**	
Approach:		☐ meets	n/a (no ground-based approach available)
Ceiling:		☐ meets	
Visibility:		☐ meets	
Approach:	LNAV	☑ meets	RNAV (GPS) RWY 19 - LNAV
Ceiling:	500 AGL	☑ meets	
Visibility:	1 statute mile	☑ meets	
Equipment:	REILs, MIRLs, PAPI	☑ meets	

Additional Requirements			
Weather:	Normally on-field, 24/7, data-linked	☑ meets	
Access to ATC Clearance:	RTR or GCO	☑ meets	
ADS-B Coverage:	1000 AGL	☐ meets	

Overall Recommendations

GENERAL		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Weather Reporting Upgrade existing AWOS-III to include present weather, lightning and freezing rain sensor.	Improves information available to pilot.	$60,000
Communications Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	Improves pilot/controller communications and clearance delivery process.	Less than $5,000
Data link Provide ADS-B coverage at 1000 AGL or lower.	Provides traffic surveillance, terrain avoidance, weather data, etc. Crucial component for Next Generation Air Transportation System.	Unknown

RUNWAY 1		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions (tree).	Standards.	Varies
Aeronautical Survey Request / complete aeronautical survey to enable development of LPV approach to Runway 1.	Provides survey data for instrument approach procedures.	$50,000
New Procedure Request development of RNAV (GPS) RWY 1 Approach with LPV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost

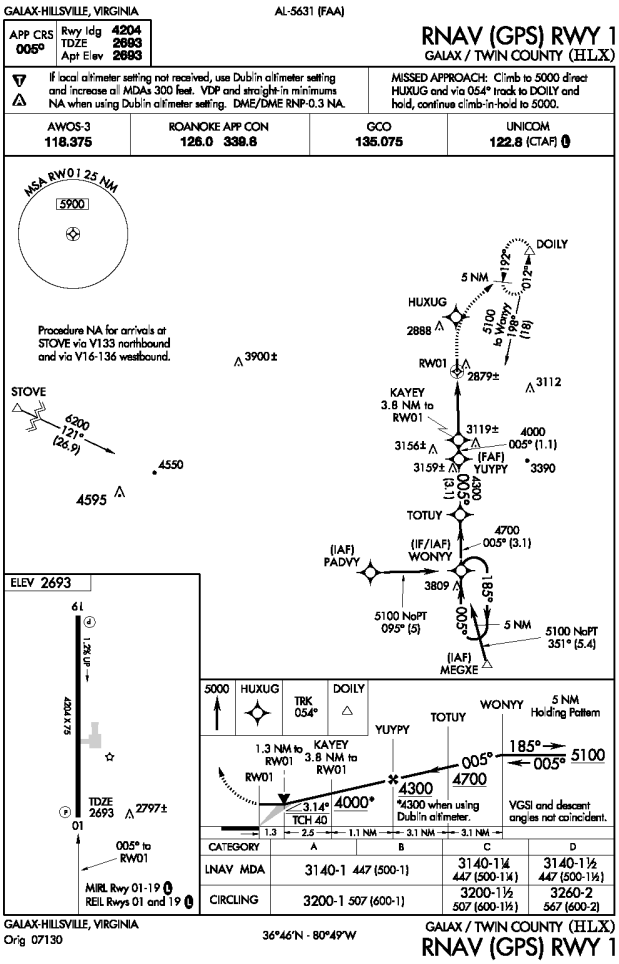
Overall Recommendations

RUNWAY 19		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions (pole).	Standards.	Varies
New Procedure Study feasibility of VOR/DME RWY 19 approach based on PSK VORTAC.	Improves ground-based approach capability. Allows for decommissioning of NDB while maintaining a ground-based approach.	No equipment cost

Twin County (HLX)

Galax-Hillsville, Virginia

Procedure Overview



RNAV (GPS) RWY 1 - LNAV

FAA PROCEDURE DATA		
Critical Obstacle:	2879	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	11	
Minimum Descent Altitude / Decision Height:	3140	

Note 1: 100' Tree 2C

Note 2:

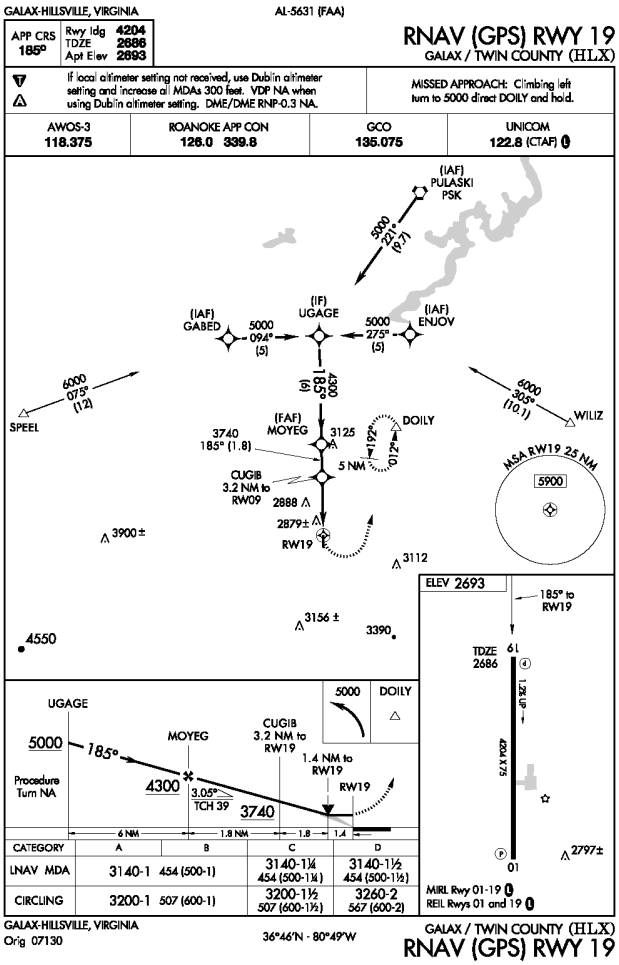
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	Yes
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Overview



RNAV (GPS) RWY 19 - LNAV

FAA PROCEDURE DATA		
Critical Obstacle:	2879	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	11	
Minimum Descent Altitude / Decision Height:	3140	

Note 1: 100' Tree 2C

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

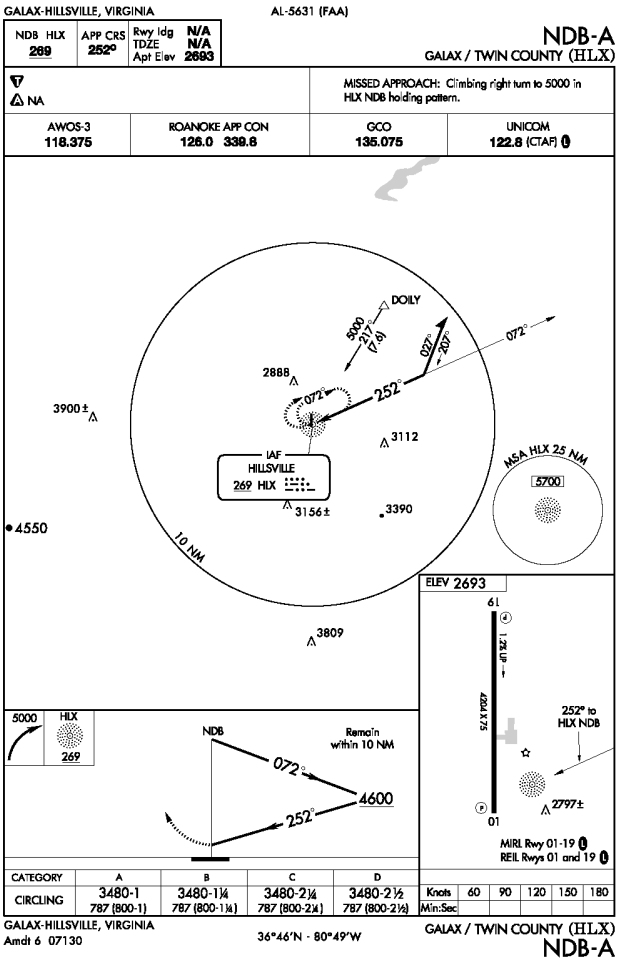
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	Yes
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Twin County (HLX)

Galax-Hillsville, Virginia

Procedure Overview



NDB-A

FAA PROCEDURE DATA		
Critical Obstacle:	3019	**see note 1**
Required Obstacle Clearance:	350	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:	100	**see note 2**
Rounding Adjustment:	11	
Minimum Descent Altitude / Decision Height:	3480	

Note 1: 100' Tree 2C

Note 2: PC

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	CIRCLING	KNOWN DEFICIENCIES
	REQUIRED	
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Recommended	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Visual (Basic)	None
Holding Position Signs and Markings	Visual (Basic)	None
Runway Edge Lights	MIRL / LIRL (for night minima only)	None
Parallel Taxiway	Recommended	Yes
Approach Lights	Not Required	Yes
Runway Design Standards	Not Required	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-2, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Recommendations

RNAV (GPS) RWY 1		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Procedure Review Change runway designation from "01" to "1".	Procedure clarity.	No equipment cost

RNAV (GPS) RWY 19		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Procedure Review Change runway designation from "01" to "1".	Procedure clarity.	No equipment cost

NDB A		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Procedure Review Change runway designation from "01" to "1".	Procedure clarity.	No equipment cost

Virginia Highlands (VJI)

Abingdon, Virginia

AIRPORT INFORMATION	
ROLE / CLASSIFICATION INFORMATION	
VATSP Classfication (2008):	General Aviation Regional
NPIAS Role (2008):	General Aviation
Study Classification:	General Aviation Regional (1 mile visibility)

ACTIVITY INFORMATION	
Based Aircraft (2007):	68
Annual Operations (2020):	26061
Annual Enplanements (2020):	n/a

DEVELOPMENT INFORMATION (2008)	
Critical Airport Reference Code (Existing):	B-II (small)
Critical Airport Reference Code (Proposed):	B-II (large)
Airport Layout Plan (Original):	March, 2003
Airport Layout Plan (Revision):	n/a

Proposed Development (from ALD):

- Extend RWY 6 (1079')

AERONAUTICAL SURVEY INFORMATION

Runway End	Survey Type	Survey Date
all	Photoslope	2001
24	ANA-LPV	2001
6	ANA-LPV	underway

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS

Available Weather Reporting:	AWOS-III
Common Traffic Advisory Frequency:	122.8
Clearance Delivery:	RTR

Nearby Navigational Aids:

WHINE	NDB	236	VJ	240°/ 4.9 NM TO FIELD
HOLSTON MOUNTAIN	VORTAC	114.6	HMV	021°/ 15.7 NM TO FIELD
GLADE SPRING	VOR/DME	110.2	GZG	167°/ 8.6 NM TO FIELD

Virginia Highlands (VJI)

Abingdon, Virginia

Instrument Approach Procedure Summary

Minimums listed are Category B

EXISTING PROCEDURES		
CIRCLING		
VOR/DME OR GPS-B	2920 - 1 (883)	Amdt 5B
RUNWAY 24		
LOC RWY 24	2580 - 1 (493)	Amdt 2A

PROCEDURES PROPOSED AS PART OF STUDY
RNAV (GPS) RWY 24 - LNAV
RNAV (GPS) RWY 24 - LPV
RNAV (GPS) RWY 6 - LNAV
RNAV (GPS) RWY 6 - LPV
RNAV (RNP) RWY 24

VISIBILITY CHANGES PROPOSED AS PART OF STUDY	
none	

REVIEWER COMMENTS

The Airport Sponsor completed the requested informational survey.

SPONSOR COMMENTS

Sponsor reports that actual pavement strength supports 30 SG.

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 6 24 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	B-II (small)	B-II large
Runway Dimensions (Length x Width in ft):	4471 x 75	5500 x 75
Runway to Taxiway Separation (feet):	240	240
Runway Lighting:	MIRL	MIRL
RUNWAY 6		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 700 x 1000	500 x 700 x 1000
Runway Markings:	Non-precision	Non-Precision
Available Visual Approach Aids:	PAPI; REILs	PAPI; REILs
RUNWAY 24		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 700 x 1000	500 x 700 x 1000
Runway Markings:	Non-precision	Non-Precision
Available Visual Approach Aids:	PAPI; ODALS	PAPI; MALS

Virginia Highlands (VJI)

Abingdon, Virginia

System Benchmarks

General Aviation Regional (1 mile visibility)			
Best Approach (Primary Runway End)			
BENCHMARK		**RUNWAY 24**	
Approach:	Ground-based	☑ meets	LOC RWY 24
Ceiling:	400 AGL	☐ meets	
Visibility:	1 statute mile	☑ meets	
Approach:	LPV	☐ meets	n/a (no satellite-based approach available)
Ceiling:	250 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Equipment:	REILs (or approach lights), MIRLs, PAPI	☑ meets	
Secondary Approach (Different Runway End)			
BENCHMARK		**RUNWAY 6**	
Approach:		☐ meets	n/a (no ground-based approach available)
Ceiling:		☐ meets	
Visibility:		☐ meets	
Approach:	LNAV	☐ meets	n/a (no satellite-based approach available)
Ceiling:	400 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Equipment:	REILs, MIRLs, PAPI	☐ meets	existing MIRLs

Additional Requirements			
Weather:	on-field, 24/7, data-linked	☑ meets	
Access to ATC Clearance:	RTR or GCO	☑ meets	somewhat reliable
ADS-B Coverage:	On ground	☐ meets	

Overall Recommendations

GENERAL		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Weather Reporting Upgrade existing AWOS-III to include present weather, lightning and freezing rain sensor.	Improves information available to pilot.	$60,000
Communications Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	Improves pilot/controller communications and clearance delivery process.	Less than $5,000
Data link Provide ADS-B coverage while on the ground.	Provides traffic surveillance, terrain avoidance, weather data, etc. Crucial component for Next Generation Air Transportation System.	$100,000

RUNWAY 6		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions (trees).	Standards.	Varies
Runway End Identifier Lights Install REILs for Runway 6.	Improves pilot's ability to detect the landing environment.	$50,000
Precision Approach Path Indicator Install 4-box PAPI for Runway 6.	Provides visual vertical descent guidance information during the approach to the runway.	$70,000
Aeronautical Survey Request / complete aeronautical survey to enable development of LNAV and LPV approaches to Runway 6.	Provides survey data for instrument approach procedures.	Underway
New Procedure Request development of RNAV (GPS) RWY 6 Approach with LPV and LNAV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost

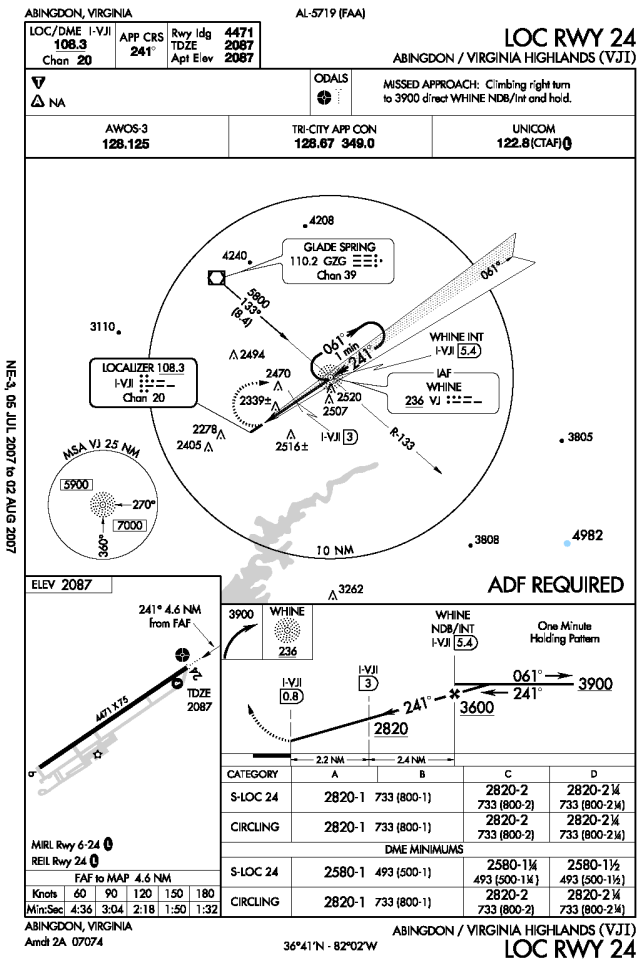
Overall Recommendations

RUNWAY 24		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions (trees).	Standards.	Varies
Precision Approach Path Indicator Upgrade Runway 24 PAPI from a 2 box to a 4 box unit.	Provides improved visual vertical descent guidance information during the approach to the runway.	$20,000
Approach Lighting System Upgrade Runway 24 ODALS to MALS.	Improves pilot's ability to detect the landing environment.	$400,000
Aeronautical Survey Request / update aeronautical survey to enable development of LNAV, LPV and RNP approaches to Runway 24.	Provides survey data for instrument approach procedures.	$40,000
New Procedure Request development of RNAV (GPS) RWY 24 Approach with LPV and LNAV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost
New Procedure Request development of RNAV (RNP) RWY 24 approach.	Improve all-weather capability of the runway and airport.	No equipment cost

Virginia Highlands (VJI)

Abingdon, Virginia

Procedure Overview



LOC RWY 24

FAA PROCEDURE DATA		
Critical Obstacle:	2339	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:	-14	**see note 2**
Rounding Adjustment:	5	
Minimum Descent Altitude / Decision Height:	2580	

Note 1: 60' Tree 2C

Note 2: secondary area adjustment

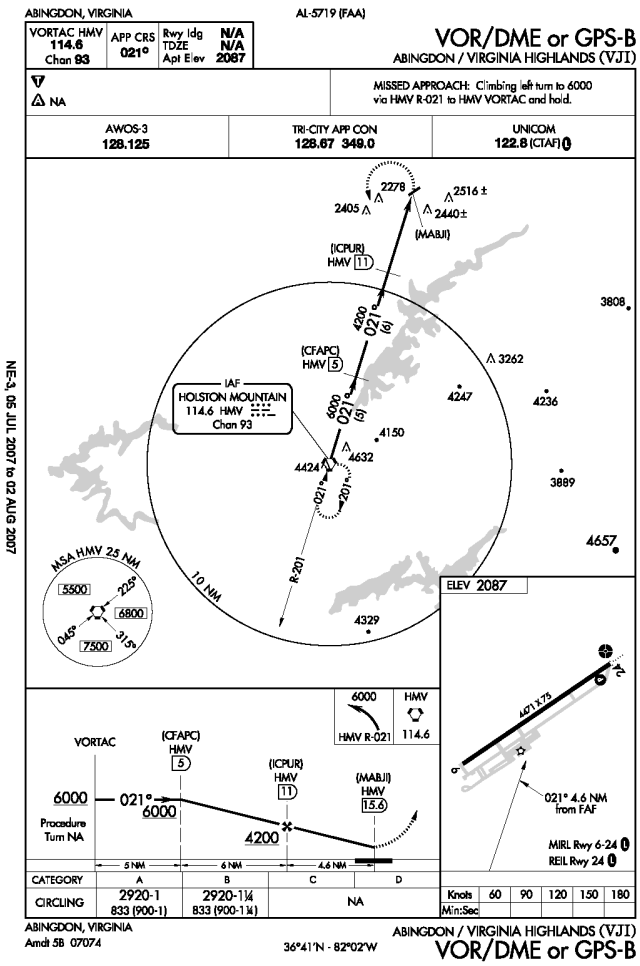
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	None
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Virginia Highlands (VJI)

Abingdon, Virginia

Procedure Overview



VOR/DME OR GPS-B

FAA PROCEDURE DATA		
Critical Obstacle:	2520	**see note 1**
Required Obstacle Clearance:	300	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:	100	**see note 2**
Rounding Adjustment:	0	
Minimum Descent Altitude / Decision Height:	2920	

Note 1: 80' Tree 2C

Note 2: precipitous terrain

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	CIRCLING	KNOWN DEFICIENCIES
	REQUIRED	
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Recommended	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Visual (Basic)	None
Holding Position Signs and Markings	Visual (Basic)	None
Runway Edge Lights	MIRL / LIRL (for night minima only)	None
Parallel Taxiway	Recommended	None
Approach Lights	Not Required	None
Runway Design Standards	Not Required	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-2, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Recommendations

LOC RWY 24		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Procedure Review Request procedure be modified to eliminate ADF requirement.	Procedure simplification and improved reliability.	No equipment cost

VOR / DME OR GPS B		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a

Virginia Tech/Montgomery Executive (BCB)

Blacksburg, Virginia

AIRPORT INFORMATION	
ROLE / CLASSIFICATION INFORMATION	
VATSP Classfication (2008):	General Aviation Community
NPIAS Role (2008):	General Aviation
Study Classification:	General Aviation Community

ACTIVITY INFORMATION	
Based Aircraft (2007):	40
Annual Operations (2020):	20779
Annual Enplanements (2020):	n/a

DEVELOPMENT INFORMATION (2008)	
Critical Airport Reference Code (Existing):	C-II
Critical Airport Reference Code (Proposed):	C-II
Airport Layout Plan (Original):	September, 1995
Airport Layout Plan (Revision):	September, 2004

Proposed Development (from ALD):

- Extend RWY 12 (950')
- Upgrade RWY 12 RPZ
- Shift RWY 12-30 (730')

AERONAUTICAL SURVEY INFORMATION

Runway End	Survey Type	Survey Date
all	Photoslope	2001
12	ANAPC	2001

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS	
Available Weather Reporting:	AWOS-III (PT)
Common Traffic Advisory Frequency:	123.05
Clearance Delivery:	RTR

Nearby Navigational Aids:

TECH	NDB	368	TEC	AT FIELD
ROANOKE	VORTAC	109.4	ROA	247°/ 18.1 NM TO FIELD
PULASKI	VORTAC	116.8	PSK	070°/ 16.3 NM TO FIELD

Virginia Tech/Montgomery Executive (BCB)

Blacksburg, Virginia

Instrument Approach Procedure Summary

Minimums listed are Category B

EXISTING PROCEDURES		
CIRCLING		
NDB OR GPS-A	3080 - 1 1/4 (948)	Amdt 3A
RUNWAY 12		
LOC/DME RWY 12	2460 - 1 (347)	Amdt 1
RNAV (GPS) RWY 12 - LNAV	2700 - 1 (587)	Orig
RNAV (GPS) RWY 12 - LPV	2548 - 1 1/2 (435)	Orig
RNAV (GPS) RWY 12 - VNAV	2539 - 1 1/2 (426)	Orig

PROCEDURES PROPOSED AS PART OF STUDY
RNAV (GPS) RWY 30 - LNAV
RNAV (GPS) RWY 30 - LPV or LP

VISIBILITY CHANGES PROPOSED AS PART OF STUDY	
none	

REVIEWER COMMENTS

A new approach to Runway 30 would eliminate the requirement for circle-to-land operations when the wind and weather conditions favor landing to the west. The Airport Sponsor completed the requested informational survey.

SPONSOR COMMENTS

Sponsor reports that runway length is 4,500 feet. Sponsor reports that 'current' ALD shows airport as B-II. Sponsor reports that much of existing parallel taxiway is at 300 foot separation.

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 12 30 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	C-II	C-II
Runway Dimensions (Length x Width in ft):	4539 x 75	5500 x 100
Runway to Taxiway Separation (feet):	240	300
Runway Lighting:	MIRL	MIRL
RUNWAY 12		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 1010 x 1700	1000 x 1510 x 1700 (U)
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	PAPI; ODALS	PAPI; ODALS
RUNWAY 30		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 1010 x 1700	500 x 1010 x 1700
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	PAPI; REIL	PAPI; REIL

Virginia Tech/Montgomery Executive (BCB)

Blacksburg, Virginia

System Benchmarks

General Aviation Community			
Best Approach (Primary Runway End)			
BENCHMARK		**RUNWAY 12**	
Approach:	Ground-based	☑ meets	LOC/DME RWY 12
Ceiling:	500 AGL	☑ meets	
Visibility:	1 statute mile	☑ meets	
Approach:	LNAV	☑ meets	RNAV (GPS) RWY 12 - VNAV
Ceiling:	400 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Equipment:	REILs, MIRLs, PAPI	☑ meets	
Secondary Approach (Different Runway End)			
BENCHMARK		**RUNWAY 30**	
Approach:		☐ meets	n/a (no ground-based approach available)
Ceiling:		☐ meets	
Visibility:		☐ meets	
Approach:	LNAV	☐ meets	n/a (no satellite-based approach available)
Ceiling:	500 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Equipment:	REILs, MIRLs, PAPI	☑ meets	

Additional Requirements			
Weather:	Normally on-field, 24/7, data-linked	☑ meets	
Access to ATC Clearance:	RTR or GCO	☑ meets	
ADS-B Coverage:	1000 AGL	☐ meets	

Overall Recommendations

GENERAL		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Radar Coverage Improve radar coverage for west and north sectors of Roanoke's radar system.	Improved service.	Unknown
Weather Reporting Upgrade existing AWOS-III to include freezing rain sensor.	Improves information available to pilot.	$50,000
Communications Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	Improves pilot/controller communications and clearance delivery process.	Less than $5,000
Data link Provide ADS-B coverage while on the ground.	Provides traffic surveillance, terrain avoidance, weather data, etc. Crucial component for Next Generation Air Transportation System.	$100,000

RUNWAY 12		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Approach Lighting System Upgrade Runway 12 ODALS to MALS.	Improves pilot's ability to detect the landing environment.	$400,000

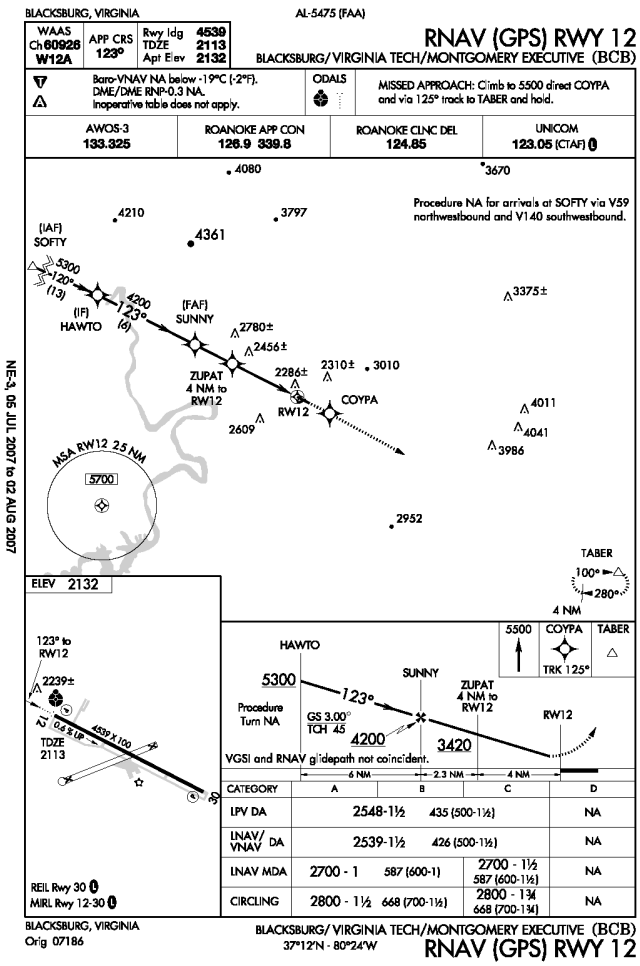
Overall Recommendations

RUNWAY 30		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions (brush).	Standards.	Varies
Precision Approach Path Indicator Upgrade Runway 30 PAPI from a 2 box to a 4 box unit.	Provides improved visual vertical descent guidance information during the approach to the runway.	$20,000
Aeronautical Survey Request / complete aeronautical survey to enable development of LNAV and LPV approach to Runway 30.	Provides survey data for instrument approach procedures.	$40,000
New Procedure Request development of RNAV (GPS) RWY 30 Approach with LNAV and LPV landing minimums.	Improve all-weather capability of the runway and airport and eliminate requirement for circle-to-land operations. An offset LNAV approach may support minimums as low as 2760-1 (628) or a reduction of 40 feet.	No equipment cost

Virginia Tech/Montgomery Executive (BCB)

Blacksburg, Virginia

Procedure Overview



RNAV (GPS) RWY 12 - LPV

FAA PROCEDURE DATA		
Critical Obstacle:	2239	**see note 1**
Required Obstacle Clearance:		
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:	50	
Other Adjustment:		**see note 2**
Rounding Adjustment:	0	
Minimum Descent Altitude / Decision Height:	2548	

Note 1: 100' Tree

Note 2:

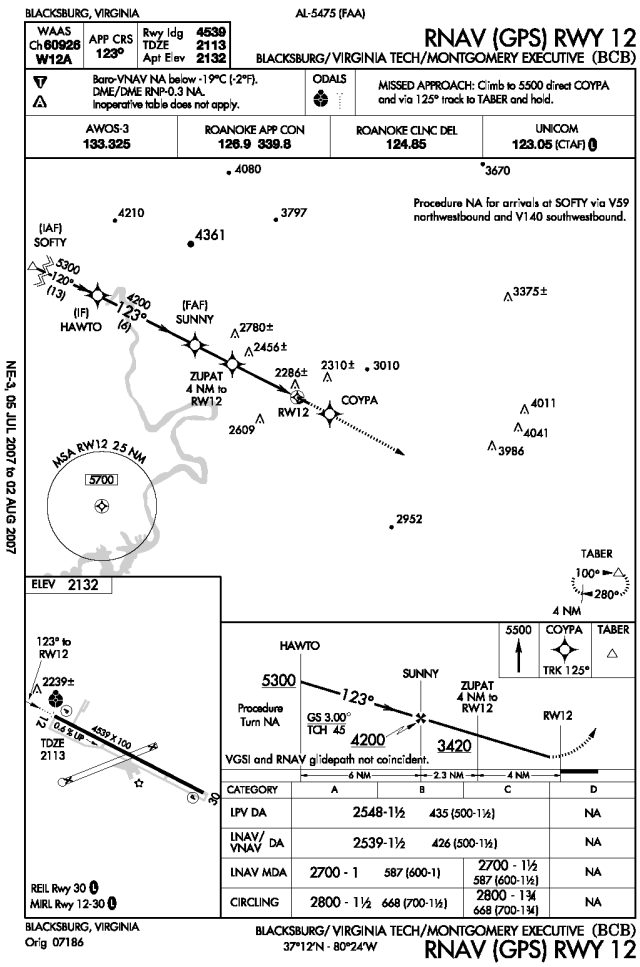
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1B - APPROACH PROCEDURE WITH VERTICAL GUIDANCE APPROACH REQUIREMENTS

	>1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	None
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 4 and 8, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Procedure Overview



RNAV (GPS) RWY 12 - VNAV

FAA PROCEDURE DATA		
Critical Obstacle:	2239	**see note 1**
Required Obstacle Clearance:		
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:	50	
Other Adjustment:		**see note 2**
Rounding Adjustment:	0	
Minimum Descent Altitude / Decision Height:	2539	

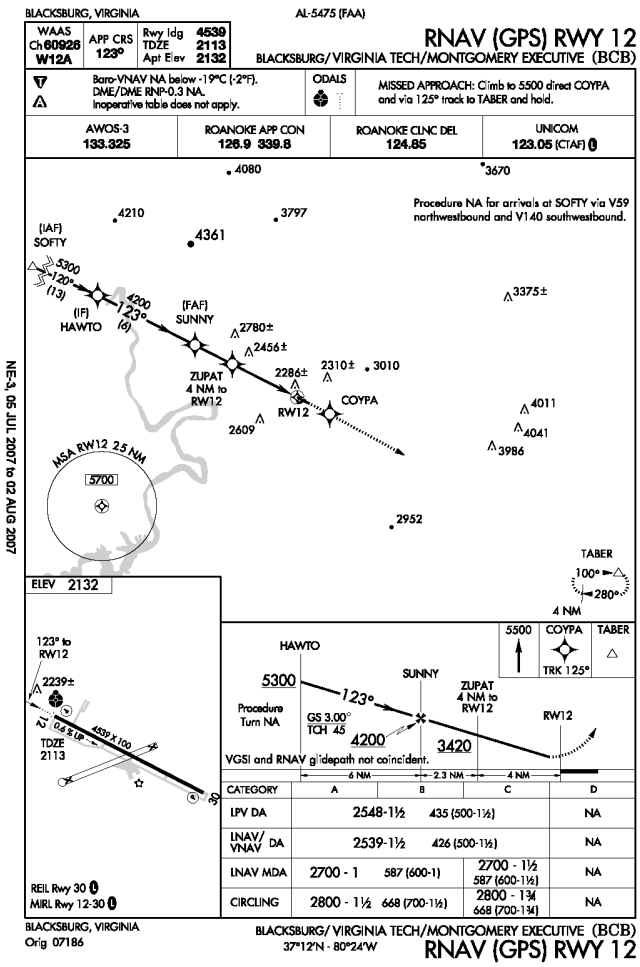
Note 1: 100' Tree

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1B - APPROACH PROCEDURE WITH VERTICAL GUIDANCE APPROACH REQUIREMENTS		
	>1 SM	**KNOWN DEFICIENCIES**
	REQUIRED	
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	None
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 4 and 8, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Procedure Overview



RNAV (GPS) RWY 12 - LNAV

FAA PROCEDURE DATA		
Critical Obstacle:	2436	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:	20	
Other Adjustment:	-18	**see note 2**
Rounding Adjustment:	12	
Minimum Descent Altitude / Decision Height:	2700	

Note 1: 100' Tree

Note 2: secondary area adjustment

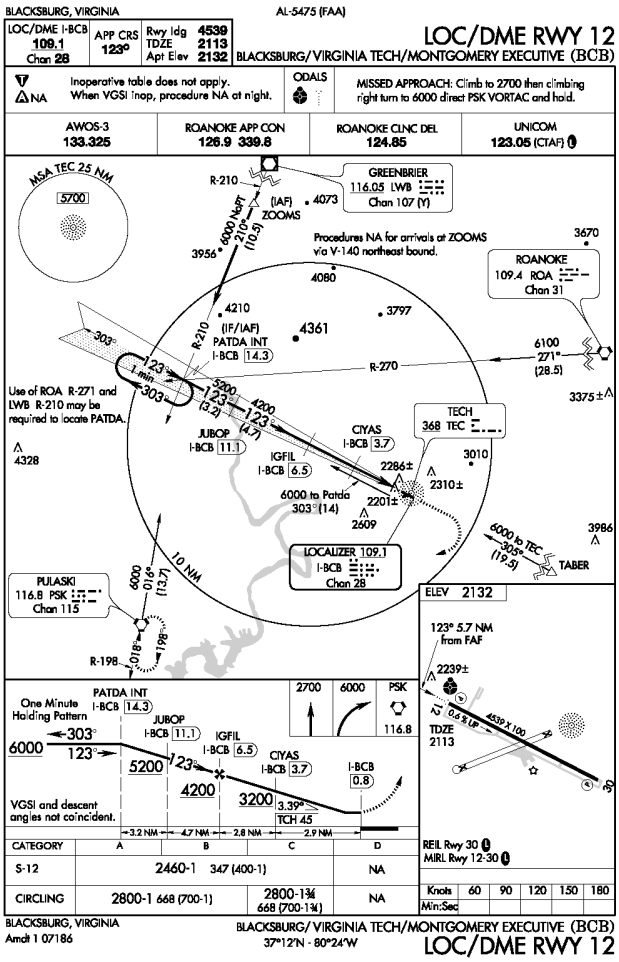
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	1 SM	**KNOWN DEFICIENCIES**
	REQUIRED	
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	None
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Virginia Tech/Montgomery Executive (BCB)

Blacksburg, Virginia

Procedure Overview



LOC/DME RWY 12

FAA PROCEDURE DATA	
Critical Obstacle:	**see note 1**
Required Obstacle Clearance:	
Remote Altimeter Adjustment:	
Accuracy Code Adjustment:	
Other Adjustment:	**see note 2**
Rounding Adjustment:	
Minimum Descent Altitude / Decision Height:	2460

Note 1:

Note 2:

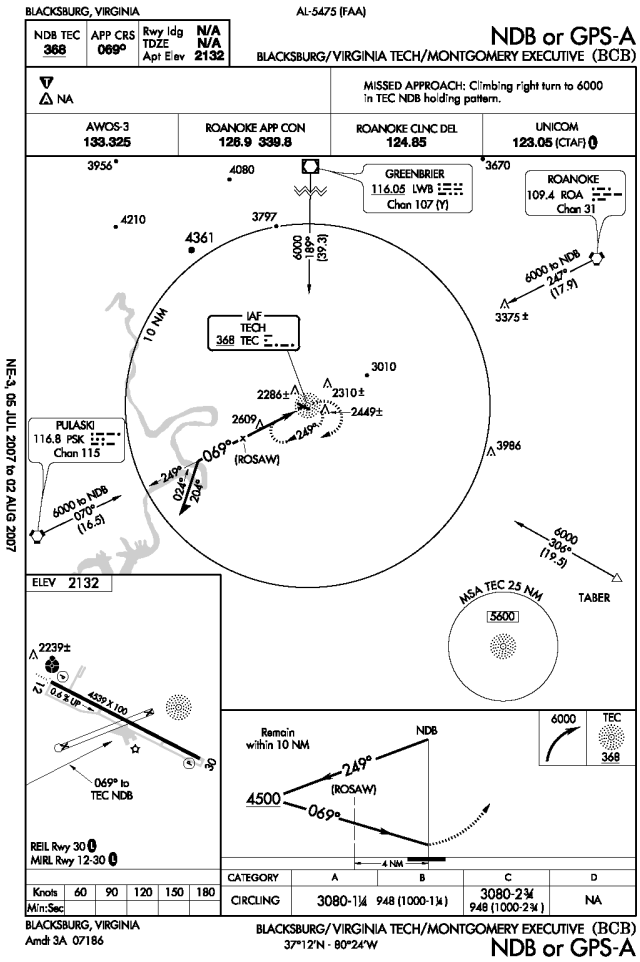
Note 3: Form 8260 missing Page 2 of 2

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	1 SM	**KNOWN DEFICIENCIES**
	REQUIRED	
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	None
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Virginia Tech/Montgomery Executive (BCB)

Blacksburg, Virginia

Procedure Overview



NDB OR GPS-A

FAA PROCEDURE DATA		
Critical Obstacle:	2668	**see note 1**
Required Obstacle Clearance:	350	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:	50	
Other Adjustment:		**see note 2**
Rounding Adjustment:	12	
Minimum Descent Altitude / Decision Height:	3080	

Note 1: Tower

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	CIRCLING	**KNOWN DEFICIENCIES**
	REQUIRED	
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Recommended	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Visual (Basic)	None
Holding Position Signs and Markings	Visual (Basic)	None
Runway Edge Lights	MIRL / LIRL (for night minima only)	None
Parallel Taxiway	Recommended	None
Approach Lights	Not Required	None
Runway Design Standards	Not Required	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-2, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Recommendations

RNAV (GPS) RWY 12		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Critical Obstacle Confirm and remove close-in critical obstructions.	Reduces LPV and VNAV visibility minimums.	$10,000
Procedure Review (Approach Category) Request addition of Approach Category D minimums to the procedure.	Improves accessibility of the airport.	No equipment cost
Visibility Minimum When site conditions permit, obtain visibility credit for the approach lighting system.	Reduces visibility minimum from 1 mile to 3/4 mile.	No equipment cost

LOC DME RWY 12		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Visibility Minimum When site conditions permit, obtain visibility credit for the approach lighting system.	Reduces visibility minimum from 1 mile to 3/4 mile.	No equipment cost
Procedure Review (Approach Category) Request addition of Approach Category D minimums to the procedure.	Improves accessibility of the airport.	No equipment cost

Procedure Recommendations

NDB OR GPS A		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a

Wakefield Muni (AKQ)

Wakefield, Virginia

AIRPORT INFORMATION	
ROLE / CLASSIFICATION INFORMATION	
VATSP Classfication (2008):	General Aviation Community
NPIAS Role (2008):	n/a
Study Classification:	General Aviation Community

ACTIVITY INFORMATION	
Based Aircraft (2007):	26
Annual Operations (2020):	23993
Annual Enplanements (2020):	n/a
DEVELOPMENT INFORMATION (2008)	
Critical Airport Reference Code (Existing):	B-II
Critical Airport Reference Code (Proposed):	B-II
Airport Layout Plan (Original):	May, 2005
Airport Layout Plan (Revision):	n/a

Proposed Development (from ALD):

- Construct parallel taxiway

AERONAUTICAL SURVEY INFORMATION

Runway End	Survey Type	Survey Date
all	Photoslope	2006

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS	
Available Weather Reporting:	ASOS
Common Traffic Advisory Frequency:	122.8
Clearance Delivery:	Phone

Nearby Navigational Aids:

WAKEFIELD	NDB	274	AKQ	AT FIELD
HOPEWELL	VORTAC	112	HPW	171°/ 21.2 NM TO FIELD
FRANKLIN	VORTAC	110.6	FKN	011°/ 16.4 NM TO FIELD

Wakefield Muni (AKQ)

Wakefield, Virginia

Instrument Approach Procedure Summary

Minimums listed are Category B

EXISTING PROCEDURES		
RUNWAY 20		
NDB RWY 20	840 - 1 (727)	Amdt 4C
RNAV (GPS) RWY 20 - LNAV	600 - 1 (487)	Orig

PROCEDURES PROPOSED AS PART OF STUDY
RNAV (GPS) RWY 2 - LNAV
RNAV (GPS) RWY 20 - LPV or LP
VOR/DME RWY 2

VISIBILITY CHANGES PROPOSED AS PART OF STUDY	
none	

REVIEWER COMMENTS

A new approach to Runway 2 would eliminate the requirement for circle-to-land operations when the wind and weather conditions favor landing to the north.

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 2 20 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	B-II	B-II
Runway Dimensions (Length x Width in ft):	4337 x 75	4337 x 75
Runway to Taxiway Separation (feet):	none	240
Runway Lighting:	MIRL	MIRL
RUNWAY 2		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	250 x 450 x 1000	250 x 450 x 1000
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	APAP	PAPI
RUNWAY 20		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	250 x 450 x 1000	250 x 450 x 1000
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	APAP	PAPI

Wakefield Muni (AKQ)

Wakefield, Virginia

System Benchmarks

General Aviation Community			
Best Approach (Primary Runway End)			
BENCHMARK		**RUNWAY 20**	
Approach:	Ground-based	☑ meets	NDB RWY 20
Ceiling:	500 AGL	☐ meets	
Visibility:	1 statute mile	☑ meets	
Approach:	LNAV	☑ meets	RNAV (GPS) RWY 20 - LNAV
Ceiling:	400 AGL	☐ meets	
Visibility:	1 statute mile	☑ meets	
Equipment:	REILs, MIRLs, PAPI	☐ meets	existing MIRLs
Secondary Approach (Different Runway End)			
BENCHMARK		**RUNWAY 2**	
Approach:		☐ meets	n/a (no ground-based approach available)
Ceiling:		☐ meets	
Visibility:		☐ meets	
Approach:	LNAV	☐ meets	n/a (no satellite-based approach available)
Ceiling:	500 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Equipment:	REILs, MIRLs, PAPI	☐ meets	existing MIRLs

Additional Requirements			
Weather:	Normally on-field, 24/7, data-linked	☑ meets	
Access to ATC Clearance:	RTR or GCO	☐ meets	
ADS-B Coverage:	1000 AGL	☐ meets	

Overall Recommendations

GENERAL		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Communications Install a Ground Communication Outlet (GCO) directly with Norfolk Approach.	Provides direct communication with approach control via radio and an "on-demand" telephone land line link. Used by aircraft on ground for obtaining or canceling IFR clearances.	$20,000
Communications Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	Improves pilot/controller communications and clearance delivery process.	Less than $5,000
Data link Provide ADS-B coverage at 1000 AGL or lower.	Provides traffic surveillance, terrain avoidance, weather data, etc. Crucial component for Next Generation Air Transportation System.	Unknown

Overall Recommendations

RUNWAY 2		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions (trees).	Standards.	Varies
Runway End Identifier Lights Install REILs for Runway 2.	Improves pilot's ability to detect the landing environment.	$50,000
Precision Approach Path Indicator Install 4-box PAPI for Runway 2.	Provides visual vertical descent guidance information during the approach to the runway.	$70,000
Aeronautical Survey Request / complete aeronautical survey to enable development of LNAV and VOR/DME approaches to Runway 2.	Provides survey data for instrument approach procedures.	$50,000
New Procedure Request development of VOR/DME RWY 2 approach.	Improve all-weather capability of the runway and airport. Permits decomissioning of the NDB while maintaining a ground based approach.	No equipment cost
New Procedure Request development of RNAV (GPS) RWY 2 Approach with LNAV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost

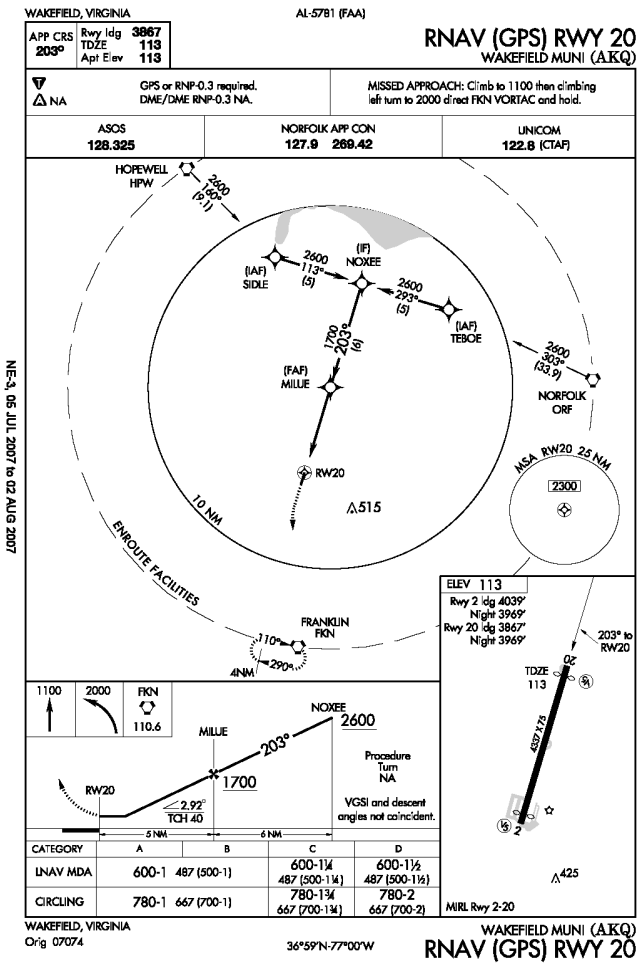
Overall Recommendations

RUNWAY 20		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions (trees).	Standards.	Varies
Runway End Identifier Lights Install REILs for Runway 20.	Improves pilot's ability to detect the landing environment.	$50,000
Precision Approach Path Indicator Install 4-box PAPI for Runway 20.	Provides visual vertical descent guidance information during the approach to the runway.	$70,000
Aeronautical Survey Request / complete aeronautical survey to enable development of an LPV approache to Runway 20.	Provides survey data for instrument approach procedures.	$50,000 (duplicate)
New Procedure Request development of RNAV (GPS) RWY 20 Approach with LPV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost

Wakefield Muni (AKQ)

Wakefield, Virginia

Procedure Overview



RNAV (GPS) RWY 20 - LNAV

FAA PROCEDURE DATA		
Critical Obstacle:	182	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:	160	**see note 2**
Rounding Adjustment:	8	
Minimum Descent Altitude / Decision Height:	600	

Note 1: 60' Tree

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

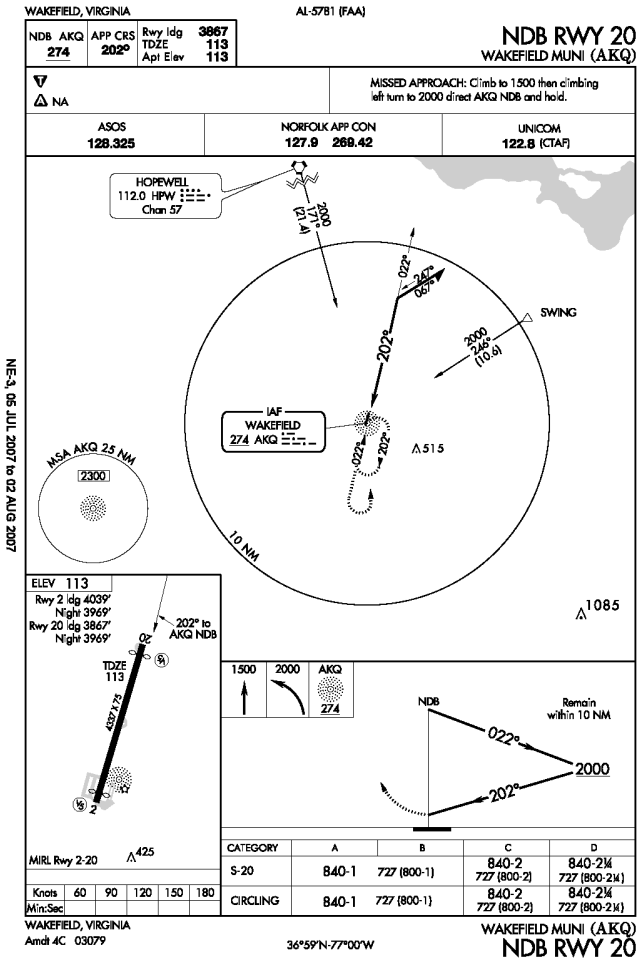
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	Yes
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Wakefield Muni (AKQ)

Wakefield, Virginia

Procedure Overview



NDB RWY 20

FAA PROCEDURE DATA		
Critical Obstacle:	239	**see note 1**
Required Obstacle Clearance:	350	
Remote Altimeter Adjustment:	100	
Accuracy Code Adjustment:		
Other Adjustment:	140	**see note 2**
Rounding Adjustment:	11	
Minimum Descent Altitude / Decision Height:	840	

Note 1: 435 tower

Note 2: missed approach segment

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	Yes
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Recommendations

RNAV (GPS) RWY 20		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a

NDB RWY 20		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Altimeter Source Request FAA re-evaluation of remote altimeter setting source penalty.	Minimum Descent Altitude (MDA) may be reduced by 100 feet by eliminating the remote altimeter setting source (RASS) adjustment.	No equipment cost
Procedure Review Cancel procedure when VOR/DME RWY 2 procedure is published.	Allows decommissioning of NDB.	No equipment cost

Warrenton-Fauquier (HWY)

Warrenton, Virginia

AIRPORT INFORMATION	
ROLE / CLASSIFICATION INFORMATION	
VATSP Classfication (2008):	Reliever
NPIAS Role (2008):	Reliever
Study Classification:	Reliever

ACTIVITY INFORMATION	
Based Aircraft (2007):	119
Annual Operations (2020):	51488
Annual Enplanements (2020):	n/a
DEVELOPMENT INFORMATION (2008)	
Critical Airport Reference Code (Existing):	C-II
Critical Airport Reference Code (Proposed):	C-II
Airport Layout Plan (Original):	May, 2007
Airport Layout Plan (Revision):	n/a

Proposed Development (from ALD):

- Upgrade RWY 14 RPZ
- Commission ILS (RWY 14)
- Install MALSR (RWY 14)
- Upgrade RWY 32 RPZ
- Install ODALS (RWY 32)

AERONAUTICAL SURVEY INFORMATION

Runway End	Survey Type	Survey Date
all	Photoslope	2006
14	ANA-LPV	2006

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS	
Available Weather Reporting:	AWOS-III (under construction)
Common Traffic Advisory Frequency:	122.7
Clearance Delivery:	GCO

Nearby Navigational Aids:

NAILR	NDB	351	MSQ	059°/ 12.1 NM TO FIELD
LINDEN	VORTAC	114.3	LDN	131°/ 28.2 NM TO FIELD
CASANOVA	VORTAC	116.3	CSN	120°/ 8.0 NM TO FIELD
BROOKE	VORTAC	114.5	BRV	321°/ 22.5 NM TO FIELD
ARMEL	VORTAC	113.5	AML	217°/ 23.8 NM TO FIELD

Warrenton-Fauquier (HWY)

Warrenton, Virginia

Instrument Approach Procedure Summary

Minimums listed are Category B

EXISTING PROCEDURES		
RUNWAY 14		
RNAV (GPS) RWY 14 - LNAV	780 - 1 (452)	Orig
VOR RWY 14	740 - 1 (412)	Amdt 4

PROCEDURES PROPOSED AS PART OF STUDY
ILS RWY 14
RNAV (GPS) RWY 14 - LPV
RNAV (GPS) RWY 32 - LNAV
RNAV (GPS) RWY 32 - LPV
VOR/DME RWY 32

VISIBILITY CHANGES PROPOSED AS PART OF STUDY	
RUNWAY 14:	1 SM to 1/2 SM
RUNWAY 32:	1 SM to 3/4 SM

REVIEWER COMMENTS

The airport has existing obstructions that need to be mitigated in order to commission the ILS RWY 14 approach. An approach lighting system (MALSR) would allow the opportunity for standard ILS minimums. The Study recommends a reduction in landing visibility minimums. Additional information regarding the estimated impacts and costs associated with the visibility changes is included in Appendix E.

SPONSOR COMMENTS

Sponsor notes that runway designation was changed to Runway 15-33 (subsequent to Study inventory).

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 14 32 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	C-II	C-II
Runway Dimensions (Length x Width in ft):	5000 x 100	5000 x 100
Runway to Taxiway Separation (feet):	400	400
Runway Lighting:	HIRL	HIRL
RUNWAY 14		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 X 1010 X 1700	1000 x 1750 x 2500
Runway Markings:	Precision	Precision
Available Visual Approach Aids:	PAPI; REILs	PAPI; MALSR
RUNWAY 32		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 X 1010 X 1700	1000 x 1750 x 2500
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	PAPI; REILs	PAPI; ODALS

Warrenton-Fauquier (HWY)

Warrenton, Virginia

System Benchmarks

Reliever			
Best Approach (Primary Runway End)			
BENCHMARK		**RUNWAY 14**	
Approach:	ILS CAT I	☐ meets	VOR RWY 14
Ceiling:	200 AGL	☐ meets	
Visibility:	1/2 statute mile	☐ meets	
Approach:	LPV	☐ meets	RNAV (GPS) RWY 14 - LNAV
Ceiling:	200 AGL	☐ meets	
Visibility:	1/2 statute mile	☐ meets	
Equipment:	MALSR, HIRLs, PAPI	☐ meets	existing HIRLs, PAPI
Secondary Approach (Different Runway End)			
BENCHMARK		**RUNWAY 32**	
Approach:	Ground-based	☐ meets	n/a (no ground-based approach available)
Ceiling:	400 AGL	☐ meets	
Visibility:	3/4 staute mile	☐ meets	
Approach:	LPV	☐ meets	n/a (no satellite-based approach available)
Ceiling:	250 AGL	☐ meets	
Visibility:	3/4 statute mile	☐ meets	
Equipment:	MALS, HIRLs, PAPI	☐ meets	existing HIRLs, PAPI

Additional Requirements			
Weather:	on-field, 24/7, data-linked	☐ meets	under construction
Access to ATC Clearance:	RTR	☐ meets	
ADS-B Coverage:	On ground	☐ meets	

Overall Recommendations

GENERAL		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Weather Reporting Request FAA commissioning of AWOS-III.	Provides local altimeter source and weather reporting.	Underway
Communications Upgrade existing Ground Communication Outlet (GCO) to a Remote Transmitter / Receiver (RTR) directly with Potomac Approach.	Improves clearance delivery process. Provides direct communication with approach control. Used by aircraft on ground for obtaining or canceling IFR clearances.	$40,000
Communications Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	Improves pilot/controller communications and clearance delivery process.	Less than $5,000
Data link Provide ADS-B coverage while on the ground.	Provides traffic surveillance, terrain avoidance, weather data, etc. Crucial component for Next Generation Air Transportation System.	$100,000
Local Area Augmentation System (LAAS) Provide LAAS coverage to augment existing global positioning system.	Provides enhanced signal accuracy.	Unknown

RUNWAY 14 32		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Airfield Lighting Control Change control sequence and/or facility directory note for HIRLs to be preset on low intensity with higher intensity activated on CTAF.	Provides visibilty of landing environment during night and adverse weather conditions even during times of aircraft equipment failure or pilot control system malfunction.	Less than $10,000

Overall Recommendations

RUNWAY 14		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions.	Standards.	Varies
Aeronautical Survey Request / complete aeronautical survey to enable development of ILS, LOC and LPV approaches to Runway 14.	Provides survey data for instrument approach procedures.	$50,000
New Procedure Commission ILS RWY 14 approach.	Improve all-weather capability of the runway and airport.	Underway
Approach Lighting System Install MALSR for Runway 14.	Improves pilot's ability to detect the landing environment.	$1,100,000
Visibility Minimum Upon installation of approach lighting system and subsequent acceptance of visibility credit, different design standards apply (less than 1 mile).	Lower landing visibility minimum.	$1,900,000
New Procedure Request development of RNAV (GPS) RWY 14 Approach with LPV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost

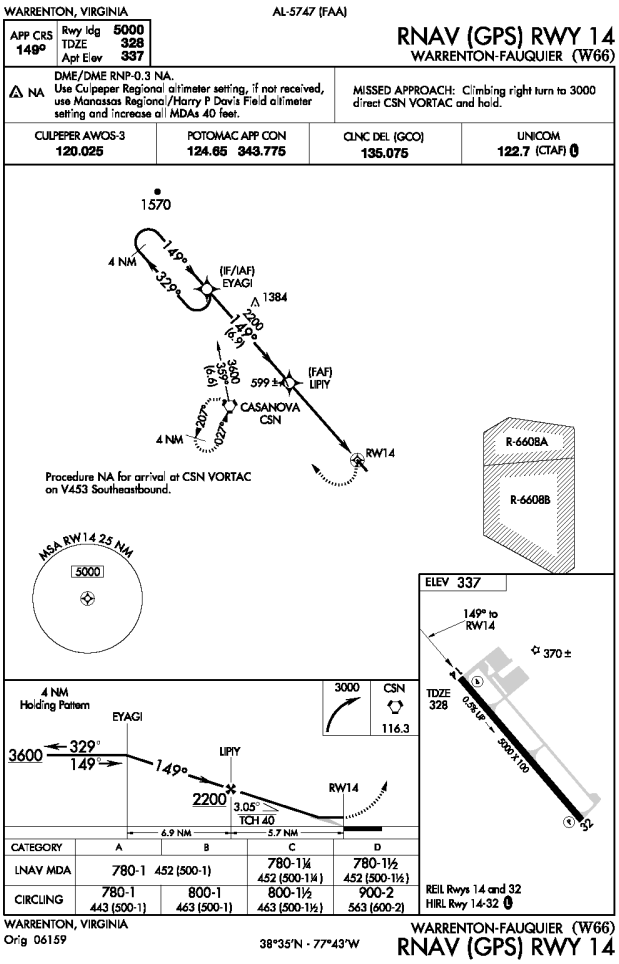
Overall Recommendations

RUNWAY 32		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Approach Lighting System Install MALS for Runway 32.	Improves pilot's ability to detect the landing environment.	$450,000
Visibility Minimum Upon installation of approach lighting system and subsequent acceptance of visibility credit, different design standards apply (less than 1 mile).	Lower landing visibility minimum.	$200,000
Aeronautical Survey Request / complete aeronautical survey to enable development of LNAV, LPV and VOR/DME approaches to Runway 32.	Provides survey data for instrument approach procedures.	$50,000 (duplicate)
New Procedure Request development of VOR/DME RWY 32 approach.	Improve all-weather capability of the runway and airport and eliminates circle-to-land requirement.	No equipment cost
New Procedure Request development of RNAV (GPS) RWY 32 Approach with LPV and LNAV landing minimums.	Improve all-weather capability of the runway and airport and eliminate requirement for circle-to-land operations.	No equipment cost

Warrenton-Fauquier (HWY)

Warrenton, Virginia

Procedure Overview



RNAV (GPS) RWY 14 - LNAV

FAA PROCEDURE DATA		
Critical Obstacle:	499	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:	21	
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	10	
Minimum Descent Altitude / Decision Height:	780	

Note 1: 50' Tree

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

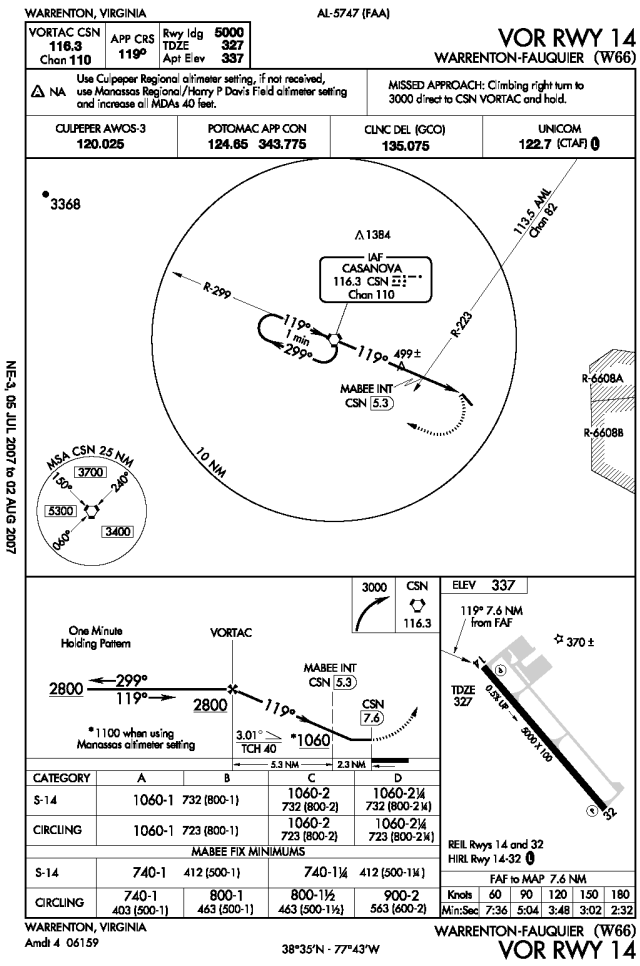
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	update underway

Warrenton-Fauquier (HWY)

Warrenton, Virginia

Procedure Overview



VOR RWY 14

FAA PROCEDURE DATA		
Critical Obstacle:	469	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:	21	
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	0	
Minimum Descent Altitude / Decision Height:	740	

Note 1: 50' Tree

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	update underway

Procedure Recommendations

RNAV (GPS) RWY 14		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Altimeter Source Request FAA re-evaluation of remote altimeter setting source penalty.	Minimum Descent Altitude (MDA) may be reduced by up to 20 feet by eliminating the remote altimeter setting source (RASS) adjustment.	No equipment cost

VOR RWY 14		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Altimeter Source Request FAA re-evaluation of remote altimeter setting source penalty.	Minimum Descent Altitude (MDA) may be reduced by up to 20 feet by eliminating the remote altimeter setting source (RASS) adjustment.	No equipment cost

Waynesboro / Eagle's Nest (W13)

Waynesboro, Virginia

AIRPORT INFORMATION	
ROLE / CLASSIFICATION INFORMATION	
VATSP Classfication (2008):	Local Service
NPIAS Role (2008):	n/a
Study Classification:	Local Service

ACTIVITY INFORMATION	
Based Aircraft (2007):	
Annual Operations (2020):	13542
Annual Enplanements (2020):	n/a

DEVELOPMENT INFORMATION (2008)	
Critical Airport Reference Code (Existing):	B-I
Critical Airport Reference Code (Proposed):	B-I
Airport Layout Plan (Original):	May, 1996
Airport Layout Plan (Revision):	n/a

Proposed Development (from ALD):
- Extend RWY 6 (500')

AERONAUTICAL SURVEY INFORMATION

Runway End	Survey Type	Survey Date
all	Photoslope	2001

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS	
Available Weather Reporting:	None
Common Traffic Advisory Frequency:	123.05
Clearance Delivery:	Phone

Nearby Navigational Aids:

MONTEBELLO	VOR/DME	115.3	MOL	041°/ 13.1 NM TO FIELD

Waynesboro / Eagle's Nest (W13)

Waynesboro, Virginia

REVIEWER COMMENTS

No published instrument approach procedures. The Airport Sponsor completed the requested informational survey.

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 6 24 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	B-I	B-I
Runway Dimensions (Length x Width in ft):	2009 x 50	2500 x 60
Runway to Taxiway Separation (feet):	150	150
Runway Lighting:	LIRL	MIRL
RUNWAY 6		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 700 x 1000	250 x 450 x 1000
Runway Markings:	Visual	Non-Precision
Available Visual Approach Aids:	none	PAPI; REILs
RUNWAY 24		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	250 x 450 x 1000	250 x 450 x 1000
Runway Markings:	Visual	Visual
Available Visual Approach Aids:	none	PAPI; REILs

William M. Tuck (W78)

South Boston, Virginia

AIRPORT INFORMATION	
ROLE / CLASSIFICATION INFORMATION	
VATSP Classfication (2008):	General Aviation Regional
NPIAS Role (2008):	General Aviation
Study Classification:	General Aviation Regional (1 mile visibility)

ACTIVITY INFORMATION	
Based Aircraft (2007):	22
Annual Operations (2020):	7925
Annual Enplanements (2020):	n/a

DEVELOPMENT INFORMATION (2008)	
Critical Airport Reference Code (Existing):	B-II
Critical Airport Reference Code (Proposed):	B-II
Airport Layout Plan (Original):	February, 2006
Airport Layout Plan (Revision):	n/a

Proposed Development (from ALD):
- Extend RWY 19 (1000')
- Install LOC (RWY 1)
- Install ODALS (RWY 1)

AERONAUTICAL SURVEY INFORMATION

Runway End	Survey Type	Survey Date
all	Photoslope	2000
1	ANA-LPV	underway

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS	
Available Weather Reporting:	None
Common Traffic Advisory Frequency:	122.8
Clearance Delivery:	Phone

Nearby Navigational Aids:

SOUT BOSTON	VORTAC	110.4	SBV	080°/ 8.3 NM TO FIELD
DANVILLE	VOR	113.1	DAN	076°/ 25.0 NM TO FIELD

William M. Tuck (W78)

South Boston, Virginia

Instrument Approach Procedure Summary

Minimums listed are Category B

EXISTING PROCEDURES		
CIRCLING		
VOR OR GPS-A	960 - 1 (540)	Amdt 7A
RUNWAY 1		
GPS RWY 1	940 - 1 (530)	Orig A

PROCEDURES PROPOSED AS PART OF STUDY
LOC RWY 1
RNAV (GPS) RWY 1 - LPV
RNAV (GPS) RWY 19 - LNAV
RNAV (GPS) RWY 19 - LPV

VISIBILITY CHANGES PROPOSED AS PART OF STUDY	
none	

REVIEWER COMMENTS

A new approach to Runway 19 would eliminate the requirement for circle-to-land operations when the wind and weather conditions favor landing to the south. The Airport Sponsor completed the requested informational survey.

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 1 19 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	B-II	B-II
Runway Dimensions (Length x Width in ft):	4011 x 75	4511/5011 x 75
Runway to Taxiway Separation (feet):	240	240
Runway Lighting:	MIRL	MIRL
RUNWAY 1		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 700 x 1000	500 x 700 x 1000
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	PAPI; REILs	PAPI; ODALS
RUNWAY 19		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 700 x 1000	500 x 700 x 1000
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	PAPI; REILs	PAPI; REILs
RUNWAY 5 23 (TURF) INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	B-I (small)	B-I (small)
Runway Dimensions (Length x Width in ft):	2665 x 200	2665 x 200
Runway to Taxiway Separation (feet):	none	none
Runway Lighting:	none	none
RUNWAY 5		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	250 x 450 x 1000	250 x 450 x 1000
Runway Markings:	none	none
Available Visual Approach Aids:	none	none
RUNWAY 23		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	250 x 450 x 1000	250 x 450 x 1000
Runway Markings:	none	none
Available Visual Approach Aids:	none	none

William M. Tuck (W78)

South Boston, Virginia

System Benchmarks

General Aviation Regional (1 mile visibility)			
Best Approach (Primary Runway End)			
BENCHMARK		**RUNWAY 1**	
Approach:	Ground-based	☐ meets	n/a (no ground-based approach available)
Ceiling:	400 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Approach:	LPV	☐ meets	GPS RWY 1
Ceiling:	250 AGL	☐ meets	
Visibility:	1 statute mile	☑ meets	
Equipment:	REILs (or approach lights), MIRLs, PAPI	☑ meets	
Secondary Approach (Different Runway End)			
BENCHMARK		**RUNWAY 19**	
Approach:		☐ meets	n/a (no ground-based approach available)
Ceiling:		☐ meets	
Visibility:		☐ meets	
Approach:	LNAV	☐ meets	n/a (no satellite-based approach available)
Ceiling:	400 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Equipment:	REILs, MIRLs, PAPI	☑ meets	

Additional Requirements			
Weather:	on-field, 24/7, data-linked	☐ meets	
Access to ATC Clearance:	RTR or GCO	☐ meets	
ADS-B Coverage:	On ground	☐ meets	

Overall Recommendations

GENERAL		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Altimeter Source / Weather Reporting Install AWOS-III.	Provides local altimeter source and weather reporting.	$150,000
Communications Install a Ground Communication Outlet (GCO) directly with Washington Center.	Provides direct communication with approach control via radio and an "on-demand" telephone land line link. Used by aircraft on ground for obtaining or canceling IFR clearances.	$20,000
Communications Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	Improves pilot/controller communications and clearance delivery process.	Less than $5,000
Data link Provide ADS-B coverage while on the ground.	Provides traffic surveillance, terrain avoidance, weather data, etc. Crucial component for Next Generation Air Transportation System.	$100,000

RUNWAY 1 19		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Airfield Lighting Control Change control sequence and/or facility directory note for MIRLs to be preset on low intensity with higher intensity activated on CTAF.	Provides visibilty of landing environment during night and adverse weather conditions even during times of aircraft equipment failure or pilot control system malfunction.	Less than $10,000

Overall Recommendations

RUNWAY 1		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions (tree).	Standards.	Varies
Runway End Identifier Lights Repair REILs and eliminate AFD note "Runway 1 REILS OTS indef".	Improves pilot's ability to detect the landing environment.	$50,000
Precision Approach Path Indicator Upgrade Runway 1 PAPI from a 2 box to a 4 box unit.	Provides improved visual vertical descent guidance information during the approach to the runway.	$20,000
Aeronautical Survey Request / complete aeronautical survey to enable development of LOC and LPV approach to Runway 1.	Provides survey data for instrument approach procedures.	Underway
New Procedure Install localizer and request development of LOC RWY 1 approach.	Improve all-weather capability of the runway and airport.	$200,000
New Procedure Request development of RNAV (GPS) RWY 1 Approach with LPV and LNAV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost

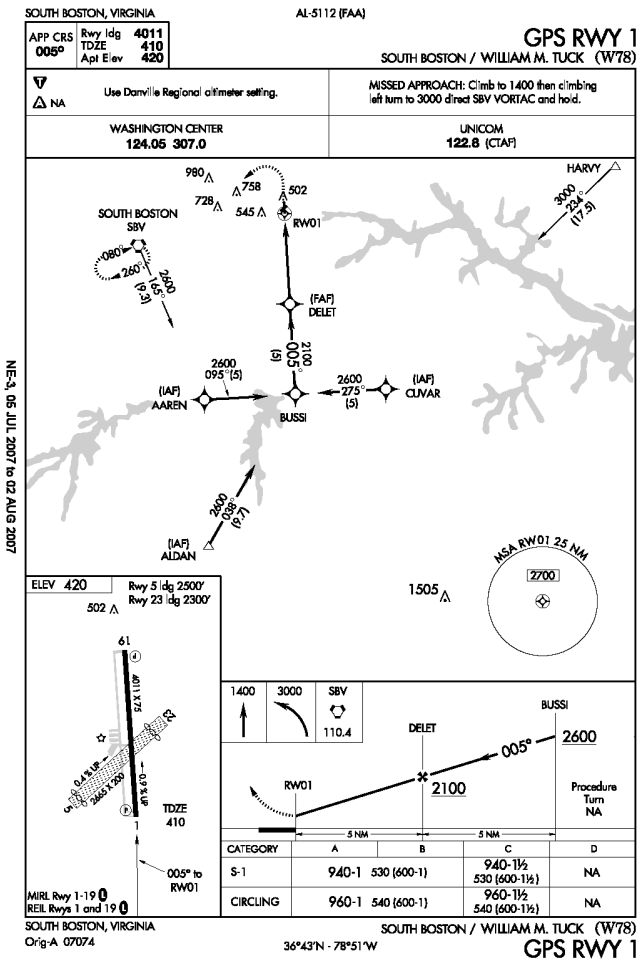
Overall Recommendations

RUNWAY 19		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions.	Standards.	Varies
Precision Approach Path Indicator Upgrade Runway 19 PAPI from a 2 box to a 4 box unit.	Provides improved visual vertical descent guidance information during the approach to the runway.	$20,000
Aeronautical Survey Request / complete aeronautical survey to enable development of LNAV and LPV approaches to Runway 19.	Provides survey data for instrument approach procedures.	$50,000
New Procedure Request development of RNAV (GPS) RWY 19 Approach with LPV and LNAV landing minimums.	Improve all-weather capability of the runway and airport and eliminate requirement for circle-to-land operations.	No equipment cost

William M. Tuck (W78)

South Boston, Virginia

Procedure Overview



GPS RWY 1

FAA PROCEDURE DATA		
Critical Obstacle:	599	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:	79	
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	12	
Minimum Descent Altitude / Decision Height:	940	

Note 1: 100' Tree

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

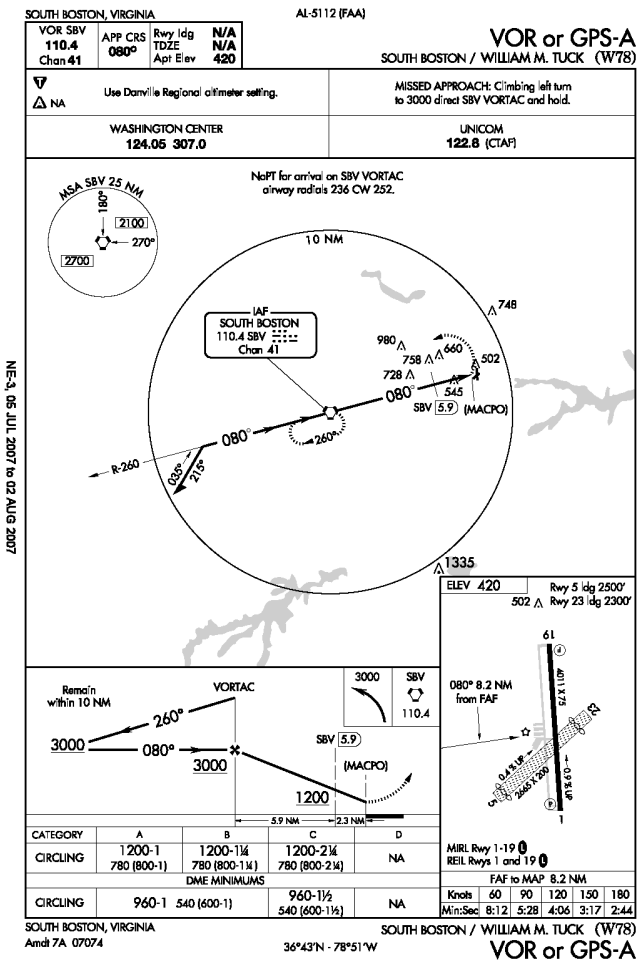
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

William M. Tuck (W78)

South Boston, Virginia

Procedure Overview



VOR OR GPS-A

FAA PROCEDURE DATA		
Critical Obstacle:	619	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:	79	
Accuracy Code Adjustment:		
Other Adjustment:	6	**see note 2**
Rounding Adjustment:	6	
Minimum Descent Altitude / Decision Height:	960	

Note 1: 100' Tree

Note 2: secondary area adjustment, new controlling obstruction, elevation and location not listed

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16		
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS		
	CIRCLING	**KNOWN DEFICIENCIES**
	REQUIRED	
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Recommended	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Visual (Basic)	None
Holding Position Signs and Markings	Visual (Basic)	None
Runway Edge Lights	MIRL / LIRL (for night minima only)	None
Parallel Taxiway	Recommended	None
Approach Lights	Not Required	Yes
Runway Design Standards	Not Required	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-2, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Recommendations

GPS RWY 1		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Procedure Review (Approach Category) Request addition of Approach Category D minimums to the procedure.	Improves accessibility of the airport.	No equipment cost
Procedure Review Request procedure title be updated to RNAV (GPS) RWY 1 format.	Procedure clarity.	No equipment cost
Altimeter Source / Weather Reporting Install AWOS-III and request FAA re-evaluation of remote altimeter setting source penalty. See Overall Recommendations.	Minimum Descent Altitude (MDA) may be reduced by 80 feet by eliminating the remote altimeter setting source (RASS) adjustment.	$150,000 (duplicate)

VOR OR GPS A		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Altimeter Source / Weather Reporting Install AWOS-III and request FAA re-evaluation of remote altimeter setting source penalty. See Overall Recommendations.	Minimum Descent Altitude (MDA) may be reduced by 80 feet by eliminating the remote altimeter setting source (RASS) adjustment.	$150,000 (duplicate)
Procedure Review Cancel procedure when LOC RWY 1 is published.		No equipment cost

Williamsburg-Jamestown (JGG)

Williamsburg, Virginia

AIRPORT INFORMATION	
ROLE / CLASSIFICATION INFORMATION	
VATSP Classfication (2008):	General Aviation Community
NPIAS Role (2008):	n/a
Study Classification:	General Aviation Community

ACTIVITY INFORMATION	
Based Aircraft (2007):	62
Annual Operations (2020):	35074
Annual Enplanements (2020):	n/a

DEVELOPMENT INFORMATION (2008)	
Critical Airport Reference Code (Existing):	B-I
Critical Airport Reference Code (Proposed):	B-II
Airport Layout Plan (Original):	March, 2006
Airport Layout Plan (Revision):	May, 2004

Proposed Development (from ALD):

- Upgrade to B-II
- Upgrade RWY 31 RPZ
- Widen runway (75')

AERONAUTICAL SURVEY INFORMATION

Runway End	Survey Type	Survey Date
all	Photoslope	2006

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS	
Available Weather Reporting:	AWOS-III
Common Traffic Advisory Frequency:	122.8
Clearance Delivery:	GCO

Nearby Navigational Aids:

HOPEWELL	VORTAC	112	HPW	112°/ 19.8 NM TO FIELD
HENRY	NDB	375	PJS	310°/ 12.4 NM TO FIELD
HARCUM	VORTAC	108.8	HCM	188°/ 12.6 NM TO FIELD
FELKER	NDB	226	FAF	332°/ 7.6 NM TO FIELD

Williamsburg-Jamestown (JGG)

Williamsburg, Virginia

Instrument Approach Procedure Summary

Minimums listed are Category B

EXISTING PROCEDURES		
CIRCLING		
VOR OR GPS-B	680 - 1 (631)	Amdt 2

PROCEDURES PROPOSED AS PART OF STUDY
RNAV (GPS) RWY 13 - LNAV
RNAV (GPS) RWY 31 - LNAV
RNAV (GPS) RWY 31 - LP

VISIBILITY CHANGES PROPOSED AS PART OF STUDY	
none	

REVIEWER COMMENTS

The airport does not currently have any straight-in or satellite-based approach procedures. The Study recommends RNAV approaches to each runway end.

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 13 31 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	B-I	B-II
Runway Dimensions (Length x Width in ft):	3204 x 60	3204 x 75
Runway to Taxiway Separation (feet):	155	155
Runway Lighting:	MIRL (non-standard)	MIRL
RUNWAY 13		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	250 x 450 x 1000	250 x 450 x 1000
Runway Markings:	Visual	Non-Precision
Available Visual Approach Aids:	APAP	PAPI; REILs
RUNWAY 31		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	250 x 450 x 1000	500 x 700 x 1000
Runway Markings:	Visual	Non-Precision
Available Visual Approach Aids:	APAP	PAPI; REILs

Williamsburg-Jamestown (JGG)

Williamsburg, Virginia

System Benchmarks

General Aviation Community			
Best Approach (Primary Runway End)			
BENCHMARK		**RUNWAY 31**	
Approach:	Ground-based	☑ meets	VOR OR GPS-B
Ceiling:	500 AGL	☐ meets	
Visibility:	1 statute mile	☑ meets	
Approach:	LNAV	☐ meets	n/a (no satellite-based approach available)
Ceiling:	400 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Equipment:	REILs, MIRLs, PAPI	☐ meets	existing REILs
Secondary Approach (Different Runway End)			
BENCHMARK		**RUNWAY 13**	
Approach:		☐ meets	n/a (no ground-based approach available)
Ceiling:		☐ meets	
Visibility:		☐ meets	
Approach:	LNAV	☐ meets	n/a (no satellite-based approach available)
Ceiling:	500 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Equipment:	REILs, MIRLs, PAPI	☐ meets	existing REILs

Additional Requirements			
Weather:	Normally on-field, 24/7, data-linked	☑ meets	
Access to ATC Clearance:	RTR or GCO	☑ meets	
ADS-B Coverage:	1000 AGL	☐ meets	

Overall Recommendations

GENERAL		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Weather Reporting Upgrade existing AWOS-III to include present weather, lightning and freezing rain sensor.	Improves information available to pilot.	$60,000
Communications Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	Improves pilot/controller communications and clearance delivery process.	Less than $5,000
Data link Provide ADS-B coverage at 1000 AGL or lower.	Provides traffic surveillance, terrain avoidance, weather data, etc. Crucial component for Next Generation Air Transportation System.	Unknown

RUNWAY 13 31		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Airfield Lighting Control Change control sequence and/or facility directory note for MIRLs to be preset on low intensity with higher intensity activated on CTAF.	Provides visibilty of landing environment during night and adverse weather conditions even during times of aircraft equipment failure or pilot control system malfunction.	Less than $10,000
Runway Lighting Upgrade non-standard MIRLs to standard system.	Improved night operations.	$150,000

Overall Recommendations

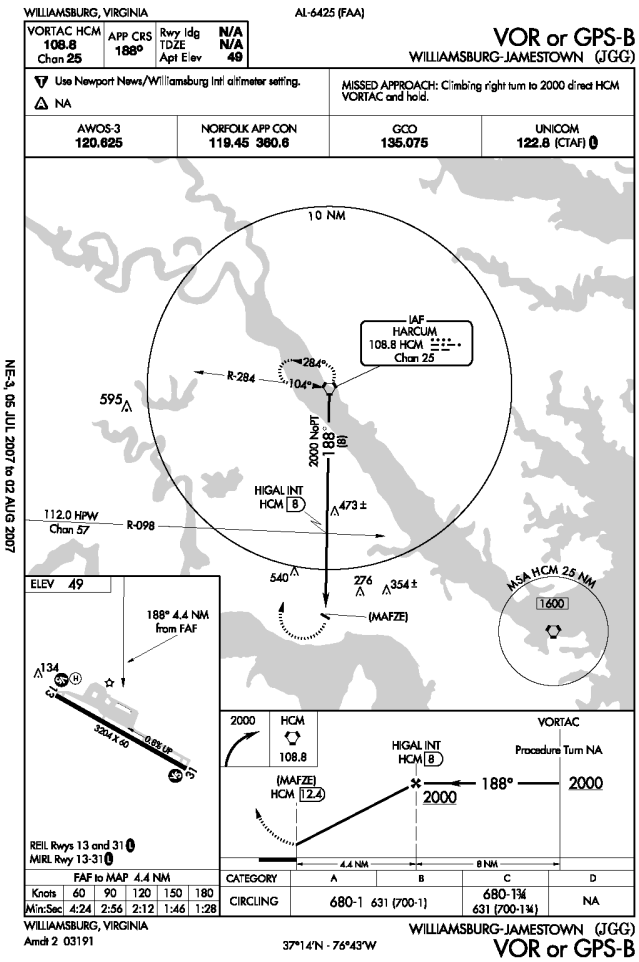
RUNWAY 13		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions (trees).	Standards.	Varies
Precision Approach Path Indicator Install 4-box PAPI for Runway 13.	Provides visual vertical descent guidance information during the approach to the runway.	$70,000
Aeronautical Survey Request / complete aeronautical survey to enable development of LNAV approach to Runway 13.	Provides survey data for instrument approach procedures.	$50,000
New Procedure Request development of RNAV (GPS) RWY 13 Approach with LNAV landing minimums.	Improve all-weather capability of the runway and airport and eliminate requirement for circle-to-land operations.	No equipment cost

RUNWAY 31		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions (trees).	Standards.	Varies
Precision Approach Path Indicator Install 4-box PAPI for Runway 31.	Provides visual vertical descent guidance information during the approach to the runway.	$70,000
Aeronautical Survey Request / complete aeronautical survey to enable development of LNAV and LP approaches to Runway 31.	Provides survey data for instrument approach procedures.	$50,000 (duplicate)
New Procedure Request development of RNAV (GPS) RWY 31 Approach with LP and LNAV landing minimums.	Improve all-weather capability of the runway and airport and eliminate requirement for circle-to-land operations.	No equipment cost

Williamsburg-Jamestown (JGG)

Williamsburg, Virginia

Procedure Overview



VOR OR GPS-B

FAA PROCEDURE DATA		
Critical Obstacle:	473	**see note 1**
Required Obstacle Clearance:	300	
Remote Altimeter Adjustment:	39	
Accuracy Code Adjustment:	50	
Other Adjustment:	-194	**see note 2**
Rounding Adjustment:	12	
Minimum Descent Altitude / Decision Height:	680	

Note 1: Tower 47-0946

Note 2: secondary area adjustment

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	CIRCLING	KNOWN DEFICIENCIES
	REQUIRED	
TERPS Paragraph 251	20:1 Clear	Yes
Airport Layout Plan	Recommended	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Visual (Basic)	None
Holding Position Signs and Markings	Visual (Basic)	None
Runway Edge Lights	MIRL / LIRL (for night minima only)	None
Parallel Taxiway	Recommended	None
Approach Lights	Not Required	None
Runway Design Standards	Not Required	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-2, Criteria	Yes
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Recommendations

VOR OR GPS B		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Altimeter Source Request FAA re-evaluation of remote altimeter setting source penalty.	Minimum Descent Altitude (MDA) may be reduced by 40 feet by eliminating the remote altimeter setting source (RASS) adjustment.	No equipment cost
Procedure Review Request procedure be updated to separate GPS approach from ground-based approach.	Procedure clarity.	No equipment cost
Procedure Review (Approach Category) Request deletion of Approach Category C minimums from the procedure.	Better reflects capabilities of airport infrastructure and design standards.	No equipment cost

Winchester Regional (OKV)

Winchester, Virginia

AIRPORT INFORMATION	
ROLE / CLASSIFICATION INFORMATION	
VATSP Classfication (2008):	General Aviation Regional
NPIAS Role (2008):	General Aviation
Study Classification:	General Aviation Regional (1/2 mile visibility)

ACTIVITY INFORMATION	
Based Aircraft (2007):	122
Annual Operations (2020):	50429
Annual Enplanements (2020):	n/a

DEVELOPMENT INFORMATION (2008)	
Critical Airport Reference Code (Existing):	C-II
Critical Airport Reference Code (Proposed):	D-III
Airport Layout Plan (Original):	July, 2005
Airport Layout Plan (Revision):	n/a

Proposed Development (from ALD):

- Upgrade to D-III
- Move taxiway by 100' to 400'
- Install ODALS (RWY 14)

AERONAUTICAL SURVEY INFORMATION

Runway End	Survey Type	Survey Date
all	Photoslope	2001
all		incl. in Study

AVAILABILITY OF COMMUNICATION / NAVIGATION / WEATHER AIDS	
Available Weather Reporting:	AWOS-III (PT)
Common Traffic Advisory Frequency:	122.7
Clearance Delivery:	RTR

Nearby Navigational Aids:

MARTINSBURG	VORTAC	112.1	MRB	230° / 20.0 NM TO FIELD
LINDEN	VORTAC	114.3	LDN	015° / 17.6 NM TO FIELD
COGAN	NDB	364	TZ	324° / 4.9 NM TO FIELD

Winchester Regional (OKV)

Winchester, Virginia

Instrument Approach Procedure Summary

Minimums listed are Category B

EXISTING PROCEDURES		
CIRCLING		
VOR/DME OR GPS-A	1260 - 1 (533)	Amdt 4A
RUNWAY 14		
GPS RWY 14	1440 - 1 (713)	Orig
RUNWAY 32		
ILS RWY 32 - ILS	974 - 1/2 (259)	Amdt 1
ILS RWY 32 - LOC	1080 - 1/2 (259)	Amdt 1

PROCEDURES PROPOSED AS PART OF STUDY
RNAV (GPS) RWY 14 - LPV
RNAV (GPS) RWY 32 - LNAV
RNAV (GPS) RWY 32 - LPV

VISIBILITY CHANGES PROPOSED AS PART OF STUDY	
none	

REVIEWER COMMENTS

The Study recommends satellite-based approaches be developed to the primary runway end (Runway 32). Vertically-guided satellite-based approaches are recommended for both runway ends. The Airport Sponsor completed the requested informational survey.

SPONSOR COMMENTS

Sponsor notes that standard (200 - 1/2) ILS minima have been obtained after removal of identified obstructions (subsequent to Study inventory).

Runway Overview

The information below has been compiled based upon a review of the Airport Layout Drawing(s).

RUNWAY 14 32 INFORMATION		
	EXISTING	**PROPOSED / ULTIMATE**
Airport Reference Code (Runway-Specific):	C-II	D-III
Runway Dimensions (Length x Width in ft):	5500 x 100	5500 x 100
Runway to Taxiway Separation (feet):	300	400
Runway Lighting:	MIRL	HIRL
RUNWAY 14		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	500 x 1010 x 1700	1000 x 1510 x 1700
Runway Markings:	Non-Precision	Non-Precision
Available Visual Approach Aids:	PAPI; REILs	PAPI; ODALS
RUNWAY 32		
	EXISTING	**PROPOSED / ULTIMATE**
Runway Protection Zone (RPZ) Design Standard:	1000 x 1750 x 2500	1000 x 1750 x 2500
Runway Markings:	Precision	Precision
Available Visual Approach Aids:	PAPI; MALSR	PAPI; MALSR

Winchester Regional (OKV)

Winchester, Virginia

System Benchmarks

General Aviation Regional (1/2 mile visibility)			
Best Approach (Primary Runway End)			
BENCHMARK		**RUNWAY 32**	
Approach:	ILS CAT I	☑ meets	ILS RWY 32 - ILS
Ceiling:	200 AGL	☐ meets	
Visibility:	1/2 statue mile	☑ meets	
Approach:	LPV	☐ meets	n/a (no satellite-based approach available)
Ceiling:	200 AGL	☐ meets	
Visibility:	1/2 statute mile	☐ meets	
Equipment:	MALSR, HIRLs, PAPI	☑ meets	
Secondary Approach (Different Runway End)			
BENCHMARK		**RUNWAY 14**	
Approach:	Ground-based	☐ meets	n/a (no ground-based approach available)
Ceiling:	400 AGL	☐ meets	
Visibility:	1 statute mile	☐ meets	
Approach:	LPV	☐ meets	GPS RWY 14
Ceiling:	250 AGL	☐ meets	
Visibility:	1 statute mile	☑ meets	
Equipment:	REILs, HIRLs, PAPI	☑ meets	

Additional Requirements			
Weather:	on-field, 24/7, data-linked	☑ meets	
Access to ATC Clearance:	RTR	☑ meets	
ADS-B Coverage:	On ground	☐ meets	

Overall Recommendations

GENERAL		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Weather Reporting Upgrade existing AWOS-III to include freezing rain sensor.	Improves information available to pilot.	$50,000
Communications Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	Improves pilot/controller communications and clearance delivery process.	Less than $5,000
Data link Provide ADS-B coverage while on the ground.	Provides traffic surveillance, terrain avoidance, weather data, etc. Crucial component for Next Generation Air Transportation System.	$100,000
Local Area Augmentation System (LAAS) Provide LAAS coverage to augment existing global positioning system.	Provides enhanced signal accuracy.	Unknown

RUNWAY 14 32		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Airfield Lighting Control Change control sequence and/or facility directory note for MIRLs to be preset on low intensity with higher intensity activated on CTAF.	Provides visibilty of landing environment during night and adverse weather conditions even during times of aircraft equipment failure or pilot control system malfunction.	Less than $10,000
Runway Lighting Replace Medium Intensity Runway Lights (MIRLs) with High Intensity Runway Lights (HIRLs).	Improves pilot's ability to detect the runway environment.	$300,000

Overall Recommendations

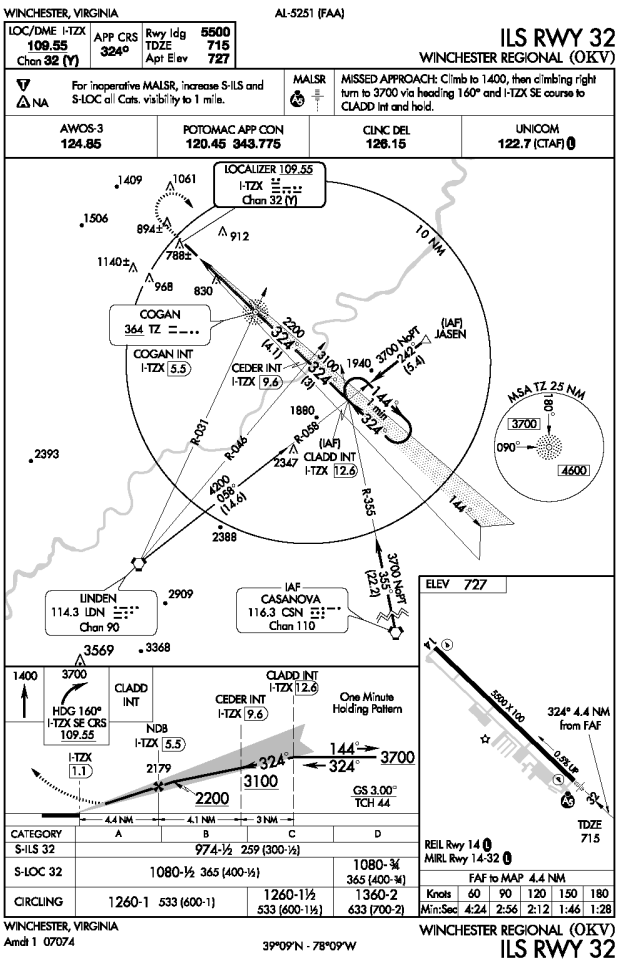
RUNWAY 14		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Obstruction Removal Remove close-in obstructions (tree).	Standards.	Varies
Precision Approach Path Indicator Upgrade Runway 14 PAPI from a 2 box to a 4 box unit.	Provides improved visual vertical descent guidance information during the approach to the runway.	$20,000
Aeronautical Survey Request / complete aeronautical survey to enable development of LPV approach to Runway 14.	Provides survey data for instrument approach procedures.	Underway as part of Study
New Procedure Request development of RNAV (GPS) RWY 14 Approach with LPV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost

RUNWAY 32		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
Precision Approach Path Indicator Upgrade Runway 32 PAPI from a 2 box to a 4 box unit.	Provides improved visual vertical descent guidance information during the approach to the runway.	$20,000
Aeronautical Survey Request / complete aeronautical survey to enable development of LNAV and LPV approaches to Runway 32.	Provides survey data for instrument approach procedures.	Underway as part of Study
New Procedure Request development of RNAV (GPS) RWY 32 Approach with LPV and LNAV landing minimums.	Improve all-weather capability of the runway and airport.	No equipment cost

Winchester Regional (OKV)

Winchester, Virginia

Procedure Overview



ILS RWY 32 - ILS

FAA PROCEDURE DATA	
Critical Obstacle:	**see note 1**
Required Obstacle Clearance:	
Remote Altimeter Adjustment:	
Accuracy Code Adjustment:	
Other Adjustment:	**see note 2**
Rounding Adjustment:	
Minimum Descent Altitude / Decision Height:	974

Note 1: ASC

Note 2:

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

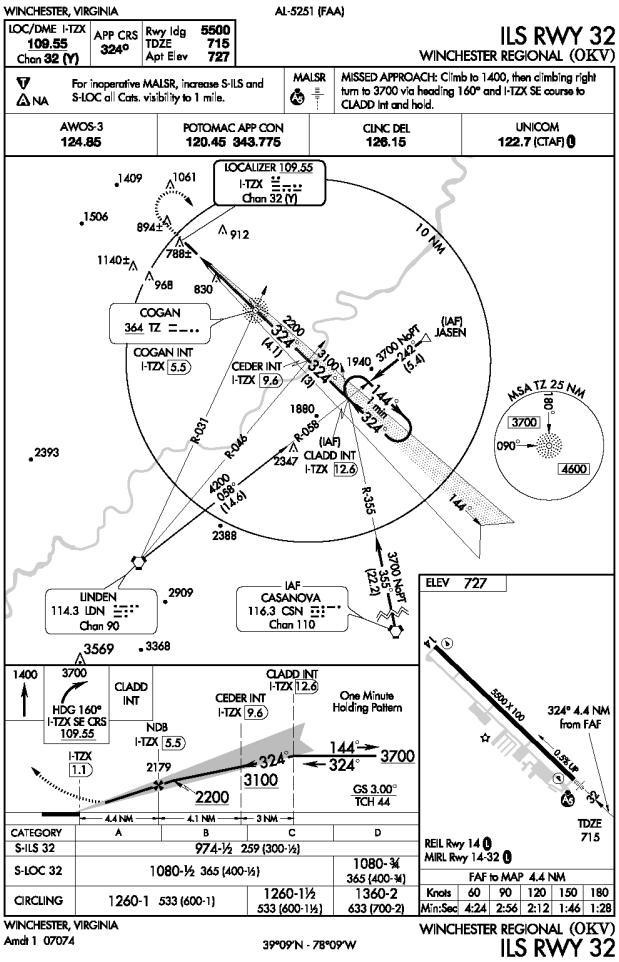
TABLE A16-1A - PRECISION INSTRUMENT APPROACH REQUIREMENTS

	<3/4 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	34:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	4,200 ft (Paved)	None
Runway Markings	Precision	None
Holding Position Signs and Markings	Precision	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	MALSR, SSALR, or ALSF	None
Runway Design Standards	<3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 9, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Winchester Regional (OKV)

Winchester, Virginia

Procedure Overview



ILS RWY 32 - LOC

FAA PROCEDURE DATA		
Critical Obstacle:	830	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:	-5	**see note 2**
Rounding Adjustment:	5	
Minimum Descent Altitude / Decision Height:	1080	

Note 1: Antenna

Note 2: secondary area adjustment

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

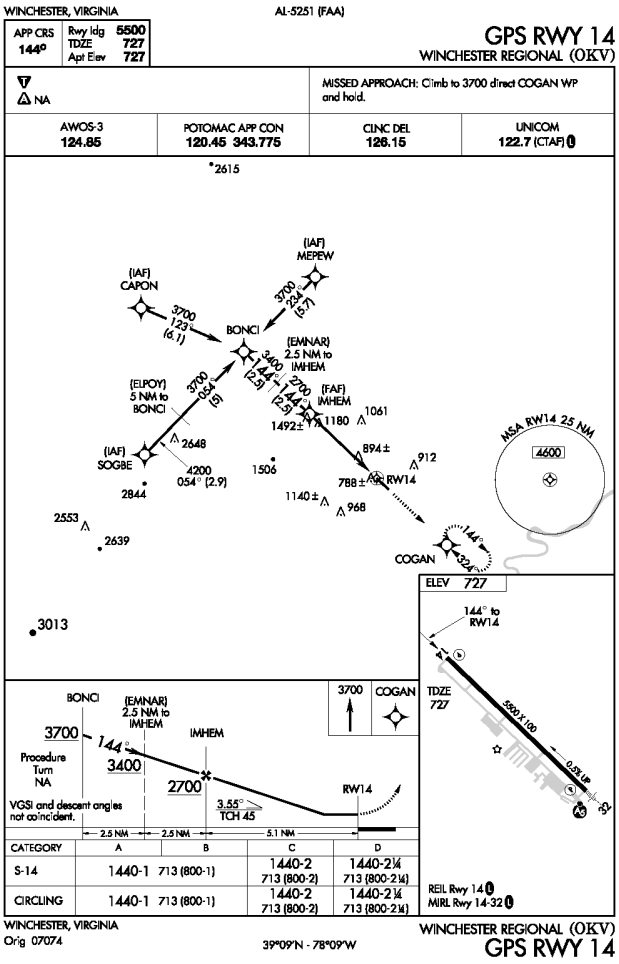
TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	<3/4 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	34:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	4,200 ft (Paved)	None
Runway Markings	Precision	None
Holding Position Signs and Markings	Precision	None
Runway Edge Lights	HIRL / MIRL	None
Parallel Taxiway	Required	None
Approach Lights	MALSR, SSALR, or ALSF Required	None
Runway Design Standards	<3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 9, Criteria	None
Survey Required for Lowest Minima	Vertically Guided Survey	None

Winchester Regional (OKV)

Winchester, Virginia

Procedure Overview



GPS RWY 14

FAA PROCEDURE DATA		
Critical Obstacle:	1180	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:		
Other Adjustment:		**see note 2**
Rounding Adjustment:	10	
Minimum Descent Altitude / Decision Height:	1440	

Note 1: TWRS (47-0013)

Note 2:

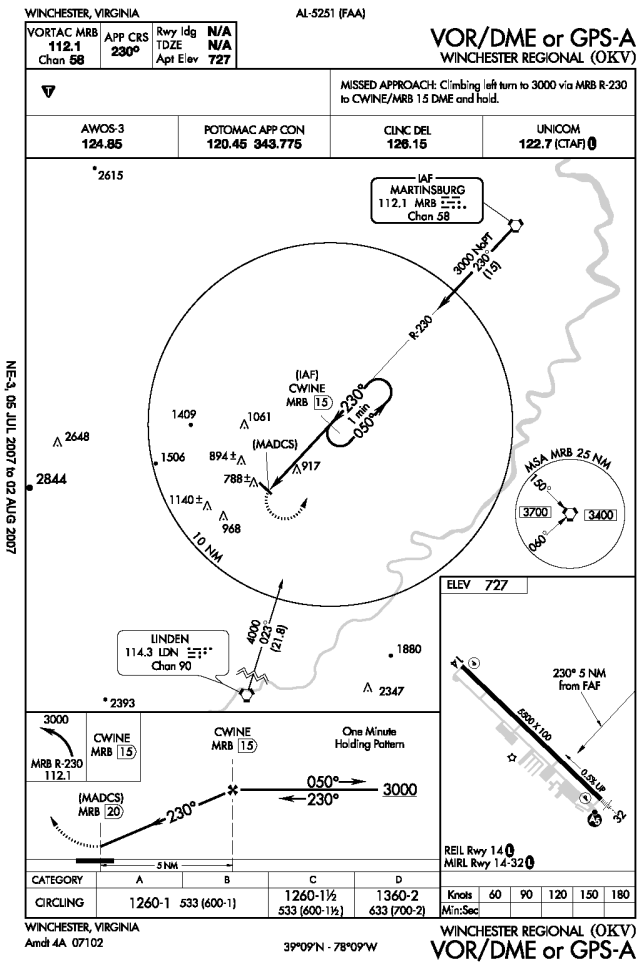
Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	1 SM	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Required	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Nonprecision	None
Holding Position Signs and Markings	Nonprecision	None
Runway Edge Lights	MIRL / LIRL	None
Parallel Taxiway	Recommended	None
Approach Lights	Recommended	Yes
Runway Design Standards	>=3/4-sm approach visibility minimums	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-5, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Overview



VOR/DME OR GPS-A

FAA PROCEDURE DATA		
Critical Obstacle:	917	**see note 1**
Required Obstacle Clearance:	250	
Remote Altimeter Adjustment:		
Accuracy Code Adjustment:	80	
Other Adjustment:		**see note 2**
Rounding Adjustment:	13	
Minimum Descent Altitude / Decision Height:	1260	

Note 1: TWR (47-1154)

Note 2: 6F AC code use for tower under construction 1998

Note 3:

ADVISORY CIRCULAR 150/5300-13, APPENDIX 16

TABLE A16-1C - NON-PRECISION APPROACH REQUIREMENTS

	CIRCLING	
	REQUIRED	**KNOWN DEFICIENCIES**
TERPS Paragraph 251	20:1 Clear	None
Airport Layout Plan	Recommended	None
Minimum Runway Length	3,200 ft	None
Runway Markings	Visual (Basic)	None
Holding Position Signs and Markings	Visual (Basic)	None
Runway Edge Lights	MIRL / LIRL (for night minima only)	None
Parallel Taxiway	Recommended	None
Approach Lights	Not Required	None
Runway Design Standards	Not Required	None
Threshold Siting Criteria To Be Met	Table A2-1, Row 1-2, Criteria	None
Survey Required for Lowest Minima	Non-Vertically Guided Survey	None

Procedure Recommendations

ILS RWY 32		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Critical Obstacle Confirm the removal of close-in critical obstruction.	Reduces Decision Altitude (DA) to ILS standard minimum.	Less than $10,000

GPS RWY 14		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Procedure Review Request procedure title be updated to RNAV (GPS) RWY 14 format.	Procedure clarity.	No equipment cost
Critical Obstacle Field verify critical obstacle to change accuracy code from "F" to "A" or 80 feet to 3 feet.	Minimum Descent Altitude (MDA) may be reduced by 60 to 80 feet.	Less than $10,000

VOR / DME OR GPS A		
PROPOSED IMPROVEMENT	**EXPECTED BENEFIT**	**ASSOCIATED COST**
See Overall Recommendations		n/a
Procedure Review Request procedure be updated to separate GPS approach from ground-based approach.	Procedure clarity.	No equipment cost

CHAPTER 7 - FUTURE AERONAUTICAL DEVELOPMENTS

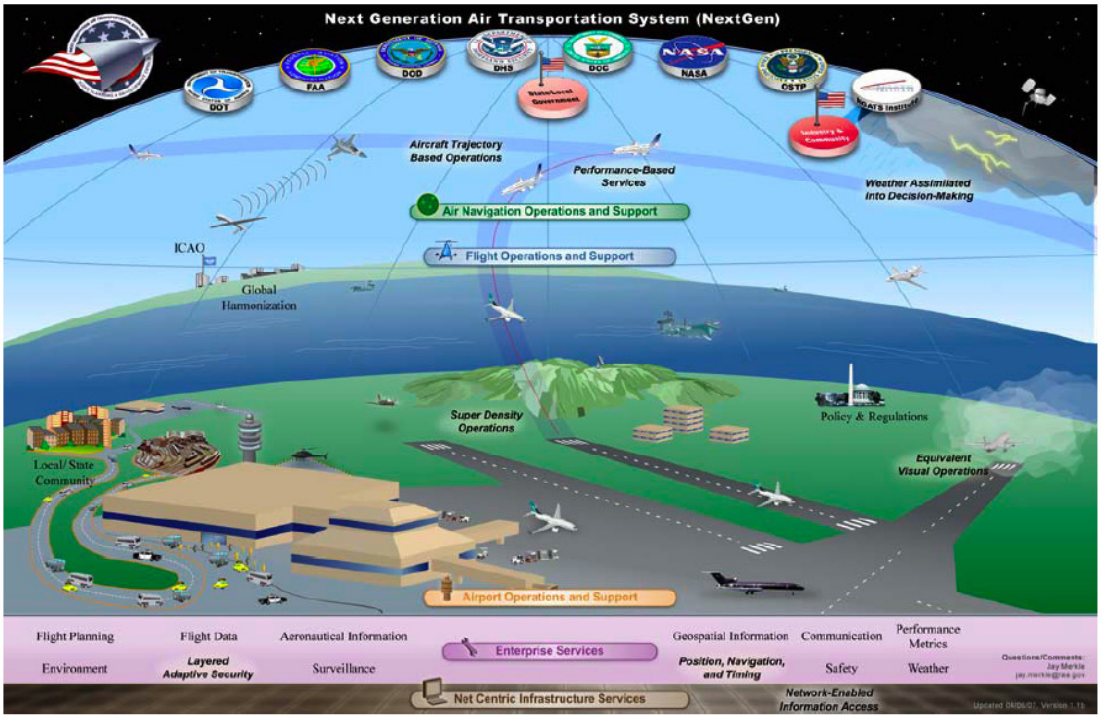
This Section explains various aviation communication, navigation and surveillance system roadmaps to help Commonwealth of Virginia planners invest in future aeronautical systems that ensure future aviation users receive an adequate level of service.

This chapter is organized in two sections. The first section identifies and summarizes the Federal Aviation Administration (FAA) roadmaps that could affect development and deployment decisions of aeronautical technology at the Commonwealth level. The roadmaps presented consider Automation and Communications, Navigation, Surveillance, and Weather. The second section describes strategies to synchronize the FAA roadmaps with the best interests of the Commonwealth. Commissioning and decommissioning of facilities and equipment, policy changes and funding streams will each be considered in the development of the proposed strategy.

THE NEXT GENERATION AIR TRANSPORTATION SYSTEM

The trust for improved aeronautical services in the National Airspace System (NAS) is the motivation behind the Next Generation Air Transportation System (NextGen). The operational concepts of NextGen and its corresponding Enterprise Architecture (EA) are defined in references 1 and 2 (JPDO, 2007). The following figure illustrates the key eight capabilities expected for NextGen.

Figure 7-1 - NextGen Concept (Joint Planning and Development Group, 2007)



source: NextGen Concept, Joint Planning and Development Group, 2007

The focus of NextGen capabilities are 8 key capabilities that will translate into safety, security, and capacity benefits of the of air transportation system. These key capabilities are (JPDO, 2008):

1. Network-Enabled Information Access
2. Performance-Based Services
3. Weather assimilated into decision-making
4. Layered, Adaptive Security
5. Broad-Area Precision Navigation
6. Aircraft Trajectory-Based Operations
7. Equivalent Visual Operations (EVO)
8. Super-Density Arrival/Departure Operations

The benefits of deploying NextGen are achieved through a combination of new procedures and technology. Envisioned NextGen benefits would apply equally to commercial passengers, air cargo, general aviation (GA), and air traffic operations.

The development of recommendations for the Virginia Department of Aviation (DOAV) will not always assume that all NextGen components are deployed. Indeed, many of the NextGen plans contain programs with a variety of risks. Some of the programs might never be developed and deployed. The view taken in this section is to assume that mature technologies will be given more relevance in describing the FAA roadmaps. This implies personal judgment on our side in describing the roadmaps and providing recommendations for action.

At the writing of this report, the FAA is in the process of re-evaluating technology programs and setting up revised roadmaps for various promising technologies. Known roadmaps address 5 key areas in aviation technology: a) Automation, b) Communication, c) Navigation, d) Surveillance and e) Weather.

Some of the plans have significant overlap. For example, the automation and surveillance plans address the need to automate many of the activities Air Traffic Control personnel do today to improve efficiency. The automation is viewed both as a capacity multiplier and as a safety backup. The technologies that will provide the greatest impact to the aviation community in the future are:

1. Automated Dependent Surveillance-Broadcast (ADS-B) and Automated Dependent Surveillance-Contract (ADS-C)
2. Data communications
3. System-wide Information Management (SWIM)

SURVEILLANCE ROADMAP

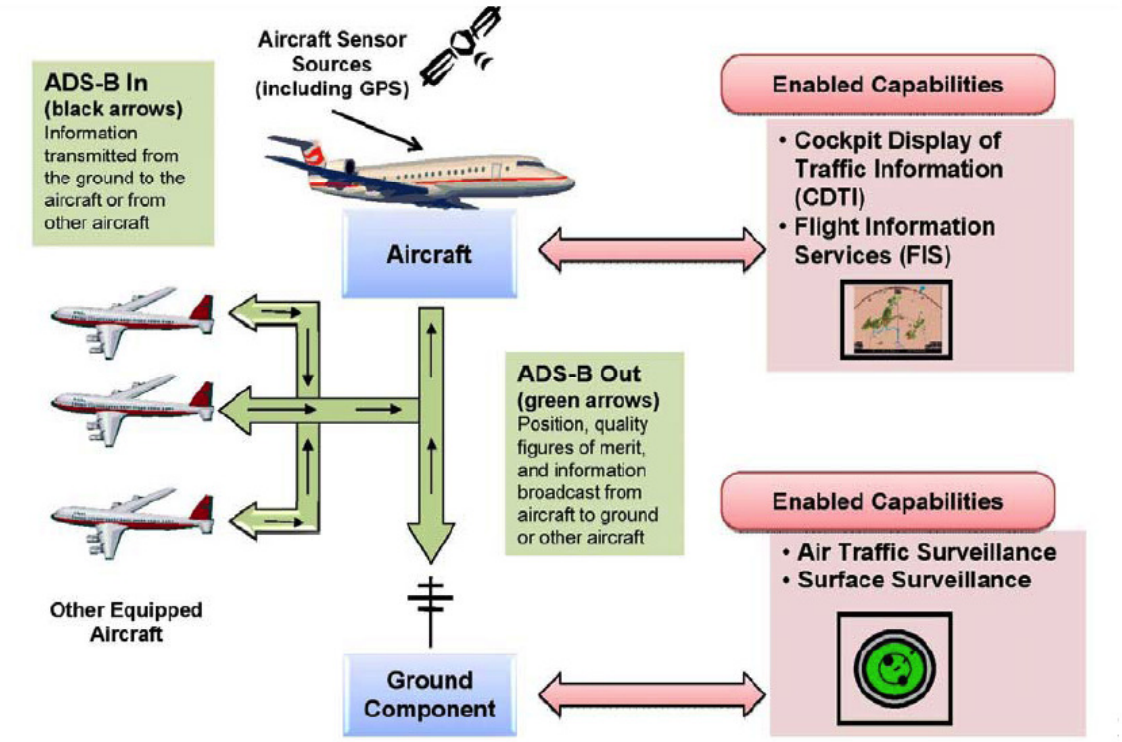
The key surveillance capability in NEXTGen is to be provided by Automated Dependent Surveillance (ADS). ADS is an aircraft system function that automatically transmits, via data link, position data derived from a precise on-board navigation system (Kayton and Fried, 1997). Two versions of ADS capability have been used in aviation applications: ADS-C (initially called ADS-A) and ADS-B.

ADS-C provides a one-to-one peer transmission between an aircraft and the Air Traffic Control Center (or airline dispatch center). ADS-C has been part of the Future Air Navigation System (FANS 1/A) international navigation specification adopted by the International Civil Aviation Organization (ICAO) (ICAO, 2006). FANS 1/A has been used in Oceanic operations since 1995. Traditionally, ADS-C systems have used a digital datalink version of the Aircraft Communication Addressing and Reporting System (ACARS) to transmit position reports over the ocean or while flying over remote areas of the world (e.g., Polar route flights). This function has replaced the old High Frequency (HF) technology used since the 1940s. Because FANS 1/A provides an interoperable capability among many countries in the world, most new-generation, long-range aircraft such as the Boeing 777, 767, 747-400 and the Airbus A330 and A340 are equipped with FANS 1/A capability out of the factory. As a precursor of ADS-B technology, FANS 1/A equipment has been only available in high-end, corporate aircraft flying between continents (i.e., Boeing BBJ and Airbus A318 corporate airliners).

ADS-B provides cooperative surveillance between an aircraft and the Air Traffic Control Center. In the ADS-B system the aircraft transmits position (three dimensions), time, pressure altitude, position integrity, flight identity, 24-bit aircraft address, velocity and other relevant data determined by aircraft on-board sensors (such as meteorological data and route data including waypoint information). The system transmits information automatically (i.e., no pilot intervention) to the Air Traffic Control Center. The surveillance information quality is dependent on the on-board avionics of the aircraft (hence the D in ADS-B acronym). In typical ADS-B implementations, the aircraft broadcasts its position (hence the B in ADS-B) every second to nearby aircraft and to ground stations. The technical specifications of the ADS-B system implemented in the United States are contained in RTCA document Do-242A (RTCA, 2005).

Figure 7-2 illustrates a typical depiction of the U.S. ADS-B implementation. The figure distinguishes between two important functions of ADS-B called ADS-B Out and ADS-B In. ADS-B Out provides aircraft sensor-derived data to support both ground and air surveillance function of the system. The ADS-B In function provides the capability to receive and display messages and to broadcast services initiated by ground stations or airborne platforms (ADS-B ARC, 2007). The ADS-B In function is critical to improve situational awareness of the flight crew and to use future air-to-air applications.

Figure 7-2 – Typical ADS-B Implementation



source: ADS-B Aviation Rulemaking Committee, 2007

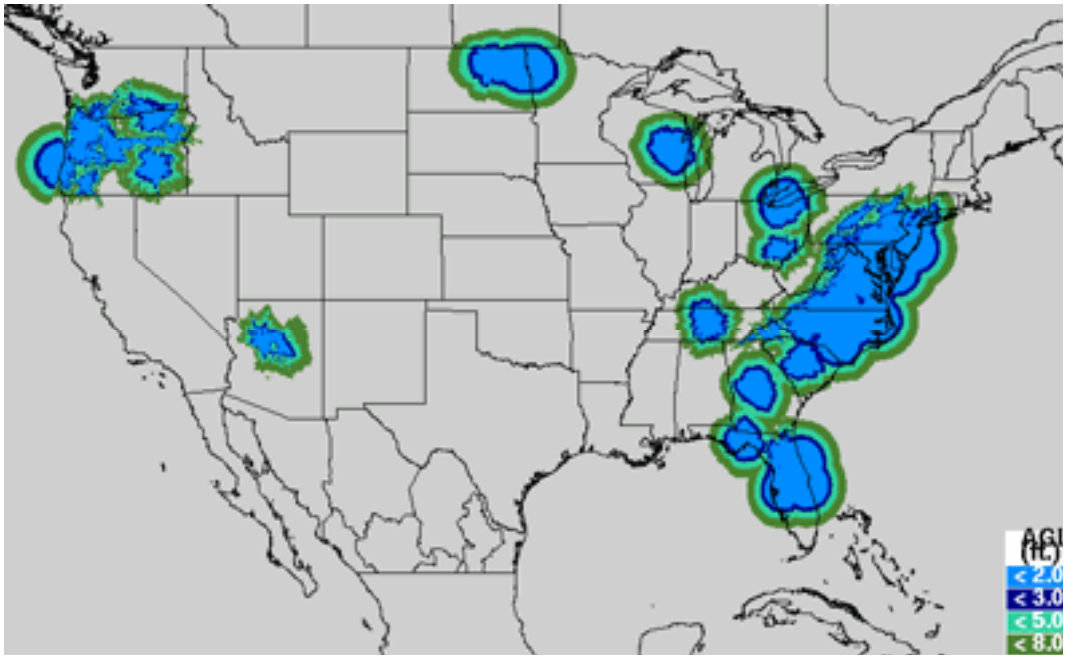
The United States implementation of the ADS-B supports two datalink technologies: Mode-S Extended Squitter (operating in the1090 Mhz frequency) and the Universal Access Transceivers (UAT) operating in the 978 Mhz frequency. Commercial aircraft and high-performance corporate aircraft will likely employ Mode-S 1090 extended squitter mode. GA aircraft will be typically equipped with the UAT technology.

The ground component of the ADS-B system depicted in Figure 7-2 consists of Ground-Based Transceivers (GBTs). GBTs are relatively simple and inexpensive ground navigation elements compared with more complex surveillance systems like ground radars. A recent Australian report compared the cost of ADS-B GBTs to support surveillance inside a 60 nautical mile terminal area (60 nautical mile radius) at $350,000 per set (including telecommunication and typical site preparation costs). For comparison, the typical cost of a secondary surveillance radar is more than $6 million (Dunstone et al., 2006).

DEPLOYMENT OF ADS-B TECHNOLOGY

To date, the FAA has installed more than 75 GBTs across the U.S. Some state and private entities have purchased GBTs for deployment at selected airports. For example, in July of 2007 the state of Oregon, under its ConnectOregon initiative, purchased UAT ADS-B GBTs from Sensis Corporation for deployment at six airports across Oregon (see Figure 7-3). Figure 7-3 illustrates the ADS-B TIS-B/FIS-B service coverage map according to FAA as of August 2008.

Figure 7-3 – Coverage of ADS-B TIS-B/FIS-B Services as of August 2008



source: FAA, 2008

According to Figure 7-3, a large portion of the Commonwealth of Virginia is covered by ADS-B services including TIS-B/FIS-B down to 2,000 feet (i.e., blue colored area). Only a small portion of the Southwest Virginia region lacks coverage according to Figure 7-3.

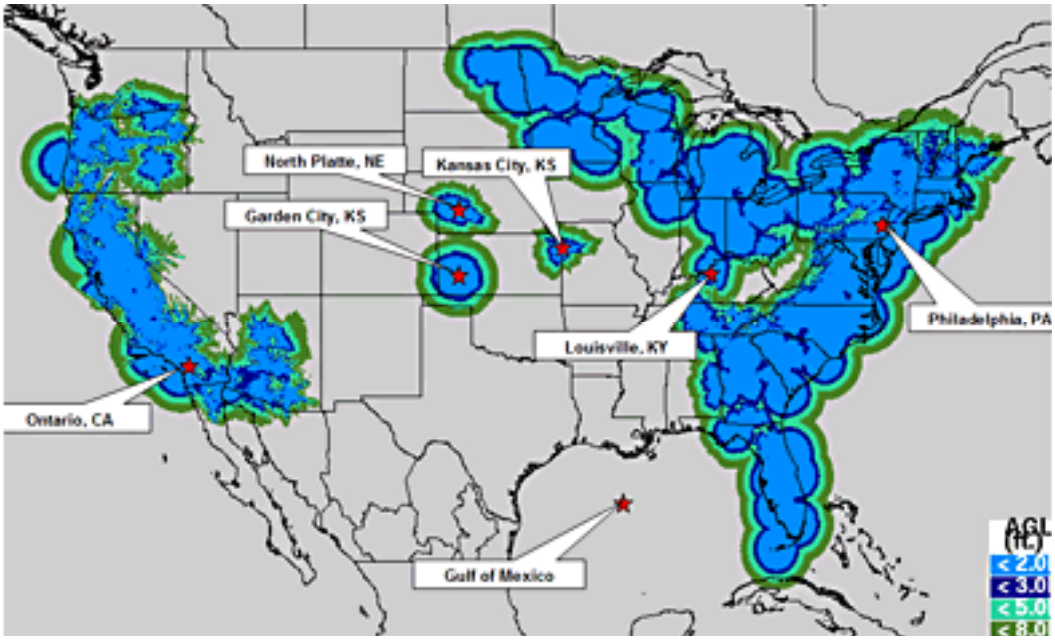
There are two segments in the deployment of ADS-B technology. Segment 1 includes the initial contract award to a team lead by ITT, In-service Decision of Broadcast Services and deployment of Initial Operational Capabilities selected areas such as the Gulf of Mexico and at key demonstration sites of advanced ADS-B services. For example, Louisville (Kentucky) shows prominently in the ADS-B deployment roadmap because United Parcel Service (UPS) has developed advanced aircraft arrival sequencing procedures coupling ADS-B technology and Cockpit Display of Traffic Information (CDTI). Table 7-1 illustrates the activities and sites expected to receive ADS-B technology in Segment 1. Figure 7-4 illustrates the U.S. coverage of ADS-B technology at the end of Segment 1 (at the end of 2010).

Table 7-1 – Segment 1 Milestones of the ADS-B Deployment Strategy

Segment 1			
Milestone	**Projected Completion Date**	**Key site SAT Successful Completion**	**Status**
Contract Award	August 2007		Complete
NPRM Issued	October 2007		Issued; displayed on Federal Register 10/2/07
Integrated Baseline Review	October 2007		Complete
Preliminary Design Review (PDR)	November 2007		Complete
Critical Design Review (CDR)	February 2008		Complete
Key Site Initial Operating Capability (IOC) of Broadcast Services	August 2008	May 2008	Complete
In-Service Decision (ISD) of Broadcast Services	November 2008		
Gulf of Mexico Comm. and Weather IOC	September 2009	March 2009	
Louisville IOC of Surveillance and Broadcast Services	October 2009	April 2009	
Final Rule Published	November 2009		
Gulf of Mexico IOC of Surveillance and Broadcast Services	December 2009	June 2009	
Philadelphia IOC of Surveillance and Broadcast Services	February 2010	August 2009	
Juneau IOC of Surveillance and Broadcast Services	April 2010	October 2009	
Surveillance and Broadcast Services ISD for ADS-B	September 2010		

source: FAA, 2008

Figure 7-4 – Segment 1 ADS-B Coverage Map



source: FAA, 2008

Table 7-2 shows the Segment 2 milestones for ADS-B deployment in the National Airspace System (NAS) between Fiscal Years 2010 and 2013. According to Table 7-2, the ADS-B infrastructure will be completed in 2013. This will include the deployment of 794 GBTs. A significant number of the ADS-B ground equipment will be collocated at AT&T telecommunication towers. According to FAA estimates, only 26% of the U.S. aircraft fleet will be ADS-B equipped by the end of 2013. A final mandate date to equip all aircraft has been set no later than the year 2020.

Figure 7-5 illustrates the expected ADS-B coverage at the end of Segment 2 when there will be four data hosting centers across the U.S. to support the ADS-B ground and air infrastructure. It should be noted from the figure that ADS-B coverage to the surface appears to be only planned for Class B airports.

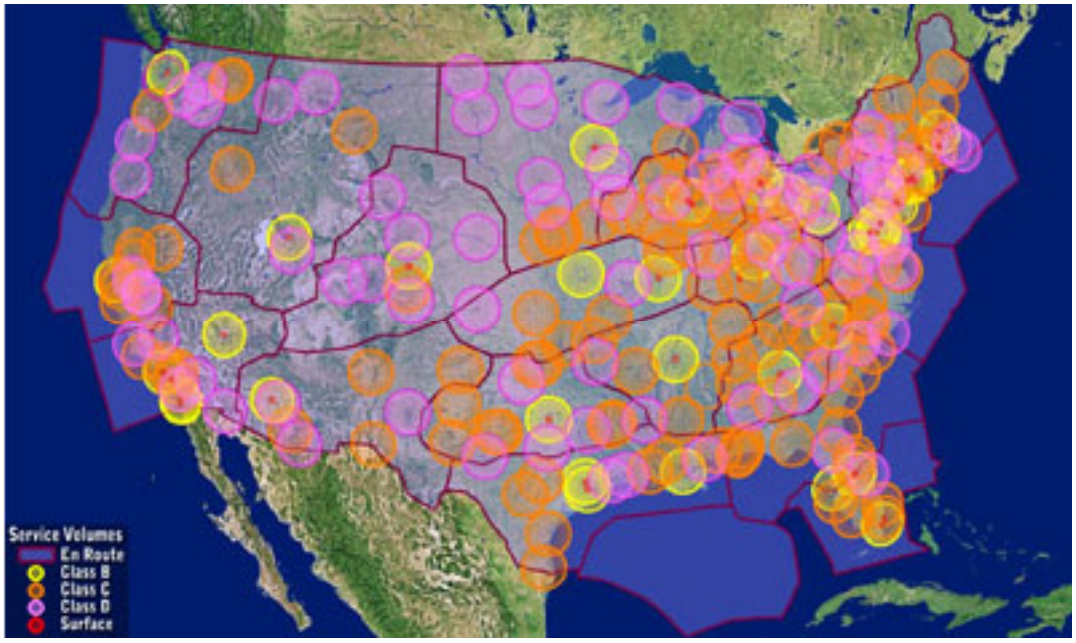
At the time of preparation of this report, the FAA has not released to the public the specific location of the GBTs. The altitude coverage of the future GBTs is roughly stated in Figures 7-3 and 7-4. The FAA is seeking approval from the Department of Homeland Security before releasing these specific locations of GBTs.

Table 7-2 – Segment 2 Milestones for ADS-B Deployment

Segment 2 (2009 2014)	
Milestone	**Projected Dates**
Continue Initial Aircraft to Aircraft Application Deployment	FY 2010 – FY 2014
Future Aircraft to Aircraft Requirements Definition / Deployment	FY 2010 – FY 2014
Continue / Complete TIS-B / FIS-B Deployment	FY 2009 – FY 2012
Continue / Complete ADS-B NAS Wide Infrastructure Deployment	FY 2010 – FY 2013
Complete 26% Avionics	FY 2014
Targeted Removal of Legacy Surveillance	FY 2016 – FY 2020
Complete 100% Avionics	FY 2020
Complete Removal of Targeted Legacy Surveillance	FY 2023
Complete Targeted Removal of TIS-B	FY 2025

source: Consultant Recommendation

Figure 7-5 – Segment 2 ADS-B Deployment



source: FAA website

ADS-B technology provides two important services to pilots in the form of Traffic Information Services–Broadcast (TIS-B) and Flight Information Services–Broadcast (FIS-B) broadcast. TIS-B broadcasts traffic information to ADS-B-equipped aircraft from ADS-B GBTs. The source of aircraft traffic information is derived from air traffic surveillance radar data. TIS-B provides ADS-B-equipped aircraft advisory traffic information in areas of airspace where not all nearby aircraft are equipped with ADS-B. This obviously has clear benefits in terms of situational awareness and improves safety and airport operational efficiency. An aircraft with a multifunction display or a Cockpit Display with Traffic Information (CDTI) provides position information of other aircraft and could assist pilots to identify and visually acquire traffic aircraft.

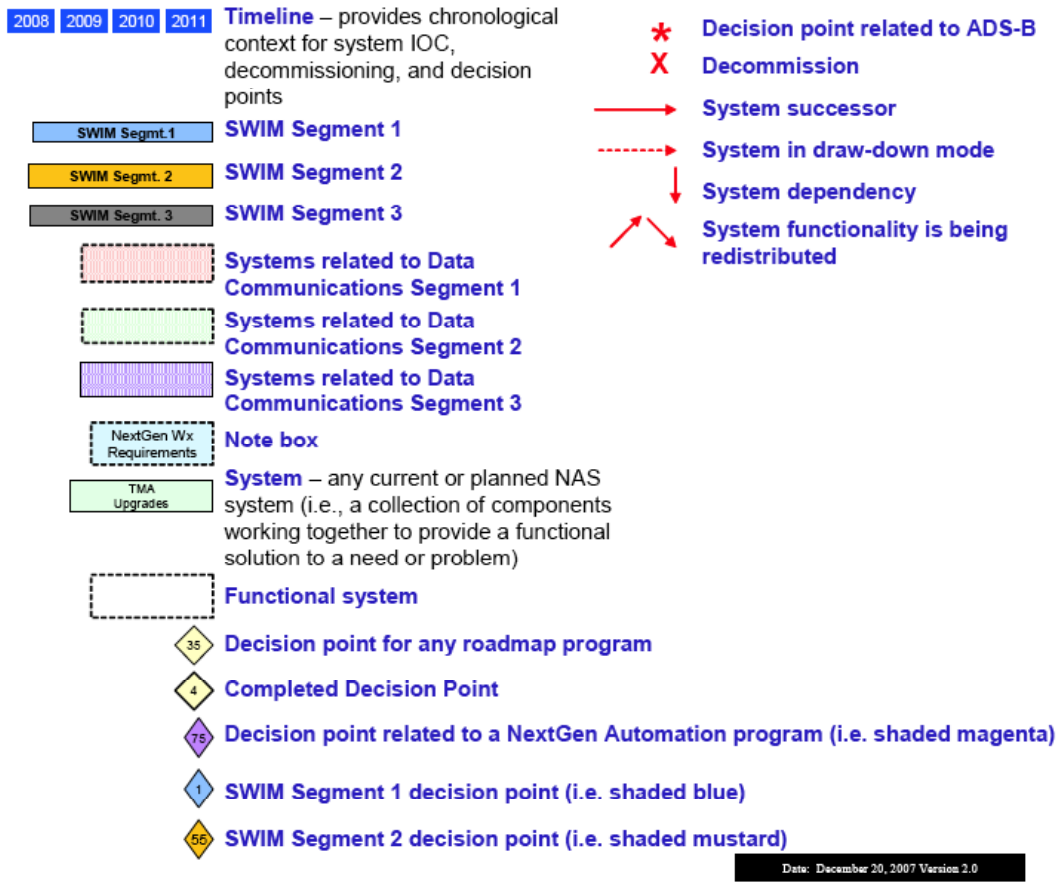
FIS-B is the ground-to-air broadcast of selected weather and aeronautical information (FAA, 2005). Depending upon the display available on the aircraft, FIS-B products may be textually or graphically depicted. FIS-B allows the pilot to passively collect and display weather and other operational data. Sample weather products are weather reports (METAR), special weather reports (SPECI), and terminal aerodrome forecasts (TAF). Graphical weather information such radar composite/mosaic images, temporary flight restricted airspace, and other notices to airmen (NOTAM) may be provided to the cockpit (FAA 2005). FIS-B propagation and reception follow line-of-sight principles and typically travel up to 200 nautical miles from each UAT GBT system.

Because both TIS-B and FIS-B services improve situational awareness and could affect safety, many of the recommendations to improve ADS-B coverage across the Commonwealth is predicated on the idea that aircraft will be equipped with multifunction displays and avionics boxes to support such services. The FAA has mandated that all aircraft be ADS-B compliant by the year 2020.

TRADITIONAL SURVEILLANCE TECHNOLOGIES

While ADS-B technologies offer clear benefits for future aviation surveillance, national security concerns dictate the maintenance of traditional surveillance systems (FAA, 2008). The following paragraphs define some of the high-level roadmaps necessary to understand how the NAS is expected to evolve (FAA, 2008). Before we start an explanation of such roadmaps, it is necessary to introduce the symbols employed in each roadmap (see Figure 7-6).

Figure 7-6 – Common Symbols Used in FAA Roadmaps

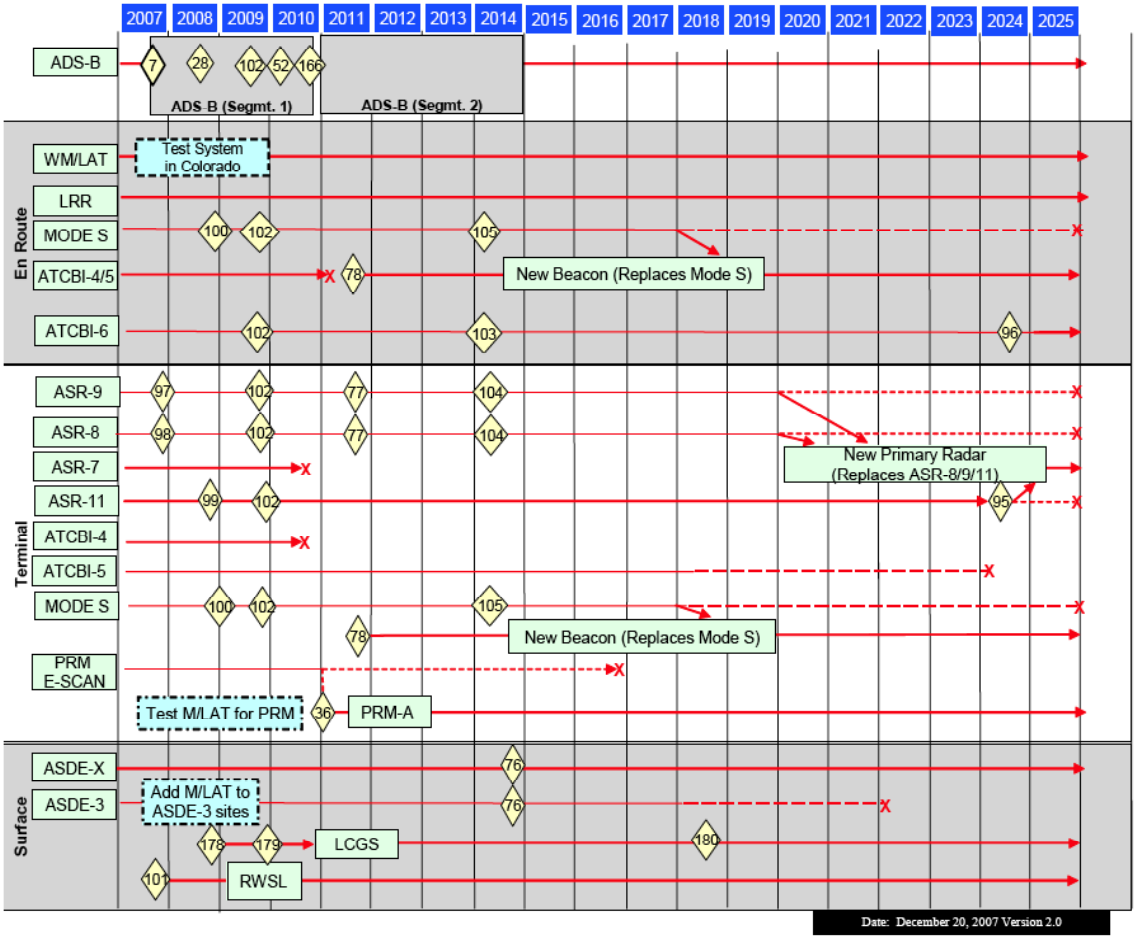


source: FAA, 2008

Figure 7-7 illustrates a complete surveillance roadmap for various elements in the NAS. Note that both ADS-B Segments 1 and 2 are shown prominently in the figure. As stated in the previous section, the deployment of all ADS-B ground systems will be completed by the end of 2013.

Figure 7-7 also shows that 137 mono-pulse Long Range Radars (LRR) available today will be retained until year 2025 as ADS-B backup for national security concerns. In the year 2014 and pending an assessment of ADS-B operational deployment, decisions will be made to remove all surface primary radars. According to the figure the Air Traffic Control Beacon Interrogator (ATCBI-4/5) systems will be phased out at the end of 2010 and replaced with newer technologies employed in the ATCBI Model 6. The ATCBI Model 6 provides digital output signals to support the Standard Terminal Replacement System (STARS) and the Automated Radar Terminal System (ARTS).

Figure 7-7 – Overall Surveillance Roadmap (Source: FAA, 2008)



source: FAA, 2008

GENERAL SURVEILLANCE ROADMAP RECOMMENDATIONS:

Because the FAA surveillance roadmap is still evolving, only general recommendations can be made to synchronize the Commonwealth and FAA future surveillance developments.

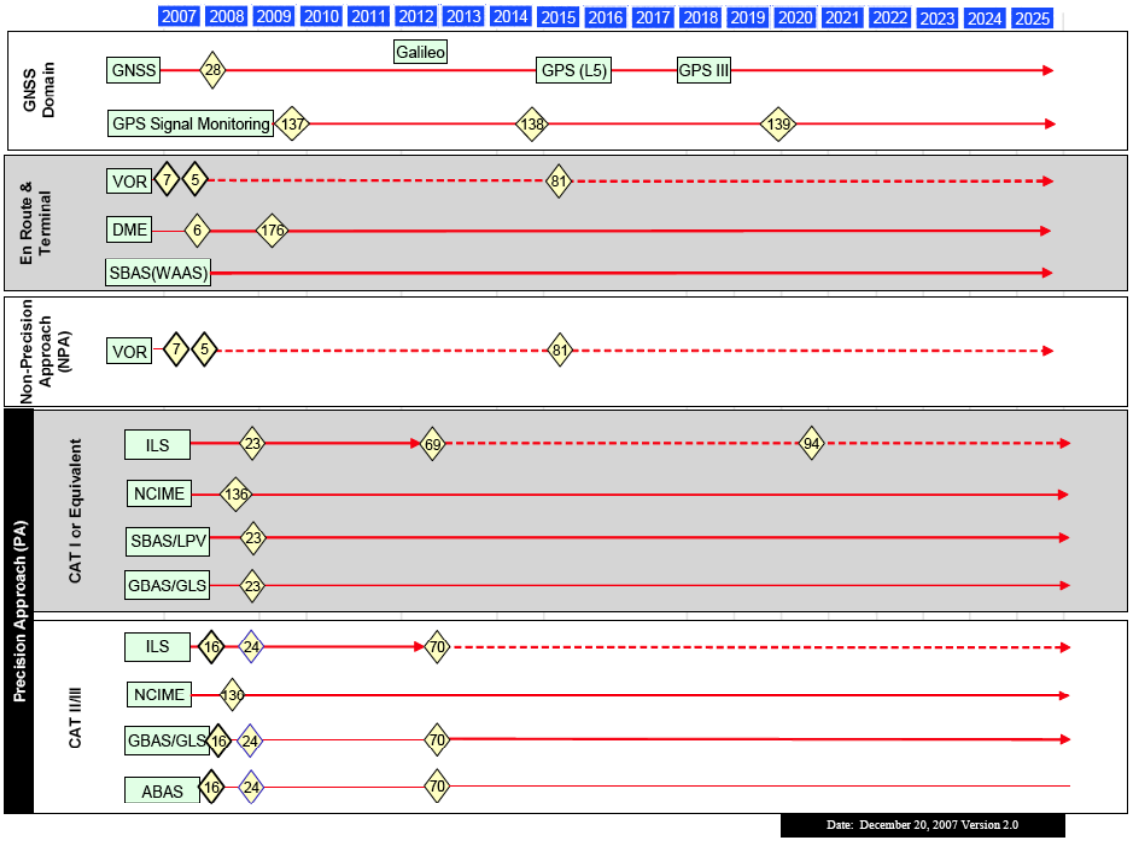
1) The FAA surveillance roadmap indicates that most of the Commonwealth has ADS-B coverage today below 2,000 feet. However, the southwest section of the Commonwealth is not covered and according to segment 1 ADS-B coverage charts will not be covered at the end of segment 1 (year 2010). Thus, the proposed steps to have ADS-B coverage down to the surface at 39 Virginia airports and down to 1,000 feet above ground level for 11 other Virginia airports could provide Virginia with a higher level of ADS-B service than is planned nationally.
2) As location of the FAA GBT installations becomes known, it is recommended that the DOAV understand the coverage offered by FAA GBT's infrastructure as a part of selecting the locations of additional GBTs around the Commonwealth.
3) The state of Oregon has installed 6 GBTs and the DOAV may wish to contact Oregon officials to learn from their experience in installing GBTs.

4) The installation of further GBT infrastructure to support ADS-B coverage to the ground or 1,000 feet require a "visibility" and sighting analysis that is beyond the scope of this study. However, as the FAA and DHS release the planned location of the 794 GBT installations around the country it is incumbent to study the coverage offered by such infrastructure to understand the needs for more GBTs around the Commonwealth. Installation of relatively inexpensive GBTs could significantly improve traffic surveillance, terrain avoidance, weather data, etc. These are crucial components for the NextGen.

NAVIGATION ROADMAP

The navigation aids deployed by the FAA in the NAS are used to support enroute navigation, terminal navigation and landing guidance (both nonprecision and precision approaches). The figure below illustrates the current FAA roadmap of the navigation infrastructure into the future.

Figure 7-8 – Navigation Roadmap



source: FAA, 2008

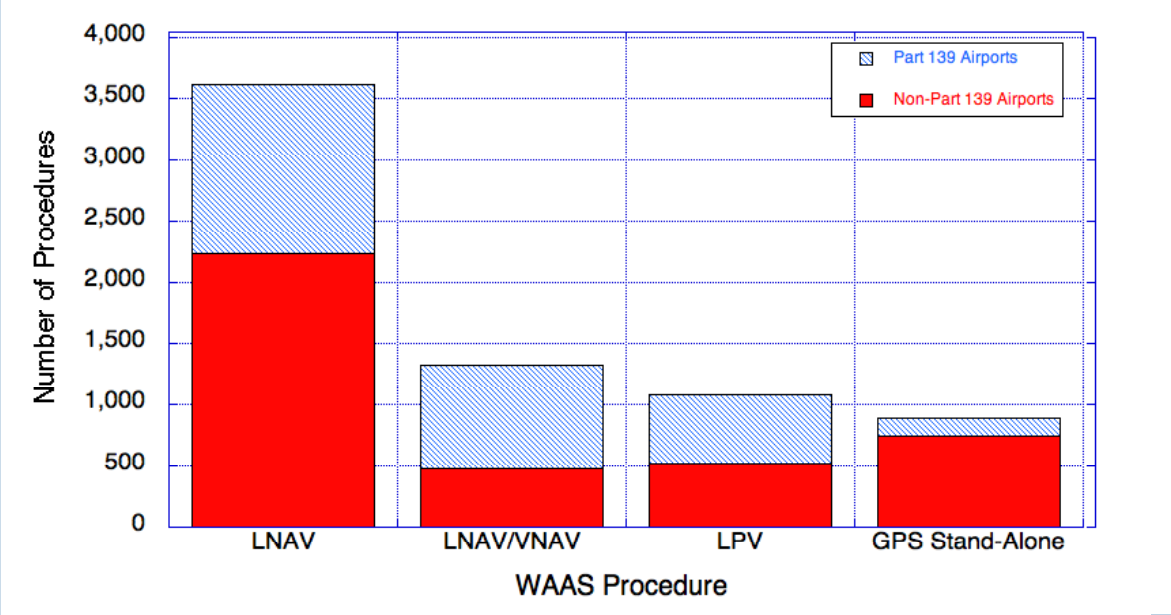
The future navigation roadmap relies heavily on Global Navigation Satellite Services (GNSS) and Space Based Augmentation Systems (SBAS). Figure 7-8 presents various additions and upgrades to GNSS technology available today. For example, the European Galileo system will gain initial deployment capability in the year 2014 according to the most recent estimates. Similarly, the U.S. GNSS satellite constellation will receive upgrades to be operational in the 2015 timeframe. Notable among them is the replacement of older satellites with GPS Block IIF (starting in 2008) and GPS Block III satellite units (starting in 2014). Block IIF and III satellites have more powerful transmitters, wider bandwidth and have more processing power and capabilities (i.e., called GPS L5 – Safety of Life - capability).

The FAA roadmap indicates that legacy systems such as Very High Frequency Omnidirectional Range (VOR) and Distance Measuring Equipment (DME) infrastructure will persist for a long time to provide backups to the GNSS-based navigation systems. According to the FAA roadmap, en route navigation VOR systems are expected to be decommissioned slowly starting in the year 2010 (FAA, 2008; DOT, 2005). Currently there are more than 1,000 VOR systems installed across the country. With the introduction of GPS systems on aircraft the decommissioning is possible albeit at a slow rate. According to the latest GA aircraft surveys, only 15% of the aircraft in the country have second-generation GPS systems capable of using the Wide Area Augmentation System (WAAS) (AOPA, 2008). FAA regulations require aircraft operations using first-generation GPS systems to carry a primary navigation system. For GA aircraft this implies carrying VOR navigation capability. An on-going study by the FAA suggests that up to half of the VORs could be decommissioned in the future (FAA, 2008). The final decision to decommission all VORs will be taken by the FAA in the year 2015 (see milestone in Figure 7-8).

According to the FAA roadmap shown in Figure 7-8, no decommissioning of DME equipment will occur at least until the year 2025. DME equipment is an integral part of terminal navigation services and is used in Required Navigation Performance and Area Navigation approaches (RNP/RNAV) to airports.

The roadmap shown in Figure 7-8 also details the future of precision landing aids such as the Instrument Landing System (ILS). Today there are 1,217 ILS systems serving 808 airports in the NAS (FAA, 2008). According to the FAA navigation roadmap, a gradual decommissioning of ILS facilities will occur after 2012 (see Figure 7-8). Note that both Category I and Category II/III ILS systems are expected to see a gradual decrease in numbers after 2012 because new technologies such as Global Navigation Satellite Landing System (GLS) and Ground Based Augmentation System (GBAS) could replace them. The first step in decommissioning Category I ILS systems is driven by the accuracy achieved with WAAS today. An alternative approach to Category I ILS is the SBAS/LPV (Localizer Performance with Vertical guidance). As of July 20, 2008 there were 1,084 certified LPV approaches in the U.S. Furthermore, there were more than 7,020 WAAS-based and GPS approaches in the U.S. in four distinct categories (including LPV approaches). Figure 7-9 illustrates the breakdown of LNAV, LNAV/VNAV, LPV and GPS stand-alone WAAS procedures in the U.S. Note that more than 73% of the procedures developed so far in the NAS support approaches to runway ends located at Non-Part 139 airports. The Commonwealth of Virginia has 138 WAAS-based and GPS approach procedures with 98 of them (71%) to Non-Part 139 airports.

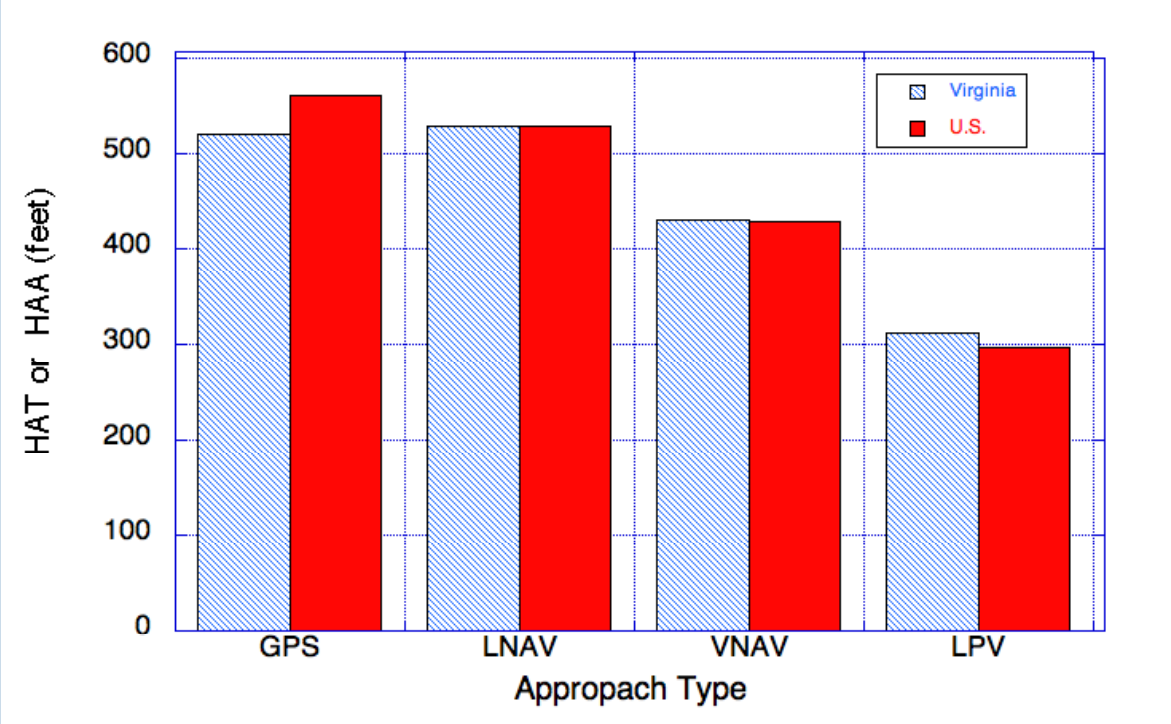
Figure 7-9 – WAAS and GPS Procedures in the US (as of July 20, 2008)



source: Virginia Tech analysis

A couple of metrics used to calibrate the level of service offered by approaches in the Commonwealth of Virginia are the Height Above Touchdown (HAT) and Height Above Airport (HAA). Figure 7-10 compares the average values of HAT or HAA for various WAAS and GPS approaches in the U.S. and Commonwealth of Virginia. The figure shows that GPS approaches in the Commonwealth fare better than the average GPS approach in the U.S. The average HAA for Commonwealth GPS approaches is 40 feet below the average HAA GPS approaches in the U.S. (520 feet for the Commonwealth of Virginia vs. 560 feet for the U.S.). The MDA for LNAV Commonwealth approaches is the same as the average for all U.S. LNAV procedures (528 feet). The average VNAV HAT is 3 feet above the average HAT for VNAV approach in the U.S. LPV approaches in the Commonwealth have HAT values 15 feet above the average HAT approach in the U.S.

Figure 7-10 – Comparison of HAT/HAA for Procedures in the US and Virginia



source: Virginig Tech analysis

The nature of the terrain and obstacles around airports influences these statistics. Nevertheless they provide an assessment of the level of service offered by WAAS and GPS approaches in the Commonwealth compared to the rest of the country.

GENERAL NAVIGATION ROADMAP RECOMMENDATIONS:

The FAA navigation roadmap is evolving, so only general recommendations can be made to synchronize the DOAV and FAA future surveillance developments. Milestones for decommissioning ILS and VOR services were expected at the end of 2008 and 2015.

RNAV (GPS) Navigation

1) The FAA plans to install WAAS approaches at almost all paved runway ends. The production schedule for specific approaches is negotiated on an ongoing basis.
2) The DOAV should continue to facilitate the installation of WAAS-based and GPS approaches by the FAA by removing obstacles, installing approach lights, and building parallel taxiways as needed to support these new approaches as desired.
3) Improvements to or implementation of GPS and RNAV approaches are proposed for 106 runways for airports in the Commonwealth of Virginia.

VOR Systems

1) According to the FAA roadmap, en route navigation VORs were to be decommissioned slowly starting in the year 2009 (FAA, 2008; DOT, 2005). The FAA VOR roadmap states that more than 400 VORs would be decommissioned starting in the year 2009.
2) The specific list of VORs to be decommissioned has not been issued by the FAA at the time of preparation of this report.
3) The decommissioning of VOR facilities according to the FAA will only be made when other navigation systems such as GPS provide the same level of redundancy and coverage as that available today with VORs.
4) The final decision to decommission all VORs in the NAS will be taken by the FAA in the year 2015 (Navigation Roadmap: FAA, 2008).
5) In addition to being required as the primary navigation for VOR approaches, VORs are also required for fixes (e.g., step down fixes) along the approach paths of other approaches.
6) Five of the airport-specific recommendations involve VOR procedure changes. (e.g., W96 – New Kent). If Virginia wants to retain these ground-based approaches based on VOR facilities being decommissioned, it appears Virginia could need to assume responsibility for certain (to be determined) VOR facilities.
7) It is recommended that the DOAV re-evaluate specific VOR facilities that were to be decommissioned in 2009 and again 2015 to understand the implications of VOR decommissioning and to make overt decisions about any equipment the DOAV might wish to take ownership of.

ILS Systems

1) The decommissioning of ILS facilities starts in the year 2012 according to the FAA roadmap with a plan for additional ILSs to be decommissioned beginning in 2020.
2) The specific ILSs to be decommissioned has not been issued by the FAA at the time of preparation of this report.
3) Since no specific list of ILS decommissioning exists at the time of this writing, it is recommended that the DOAV re-examine the FAA's ILS plans in 2012 and 2020 as a part of its planning for support of ILSs recommended for use throughout Virginia.

DME Systems

1) No decommissioning of DME equipment will occur at least until the year 2025.
2) DME equipment is an integral part of terminal navigation services and is used in Required Navigation Performance and Area Navigation approaches (RNP/RNAV) to airports.

AUTOMATION AND COMMUNICATIONS ROADMAP

The FAA future automation roadmap will support many of the services planned for the NextGen. In general the automation plan will consolidate services into larger systems. The legacy "piece-meal" approach to provide individual services has proven to be cumbersome and inefficient to maintain. Figures 7-11 and 7-12 illustrate the automation roadmap planned by the FAA for the next 17 years. Three core services of NextGen shown in Figures 7-11 and 7-12 are: 1) the System-wide Information Management (SWIM), 2) the Automated Dependent Surveillance–Broadcast system (ADS-B), and 3) the Data Communications System (DataComm). These three services support data collection, sharing and dissemination of aeronautical information in all phases of flight. ADS-B has been described in a previous section of this chapter.

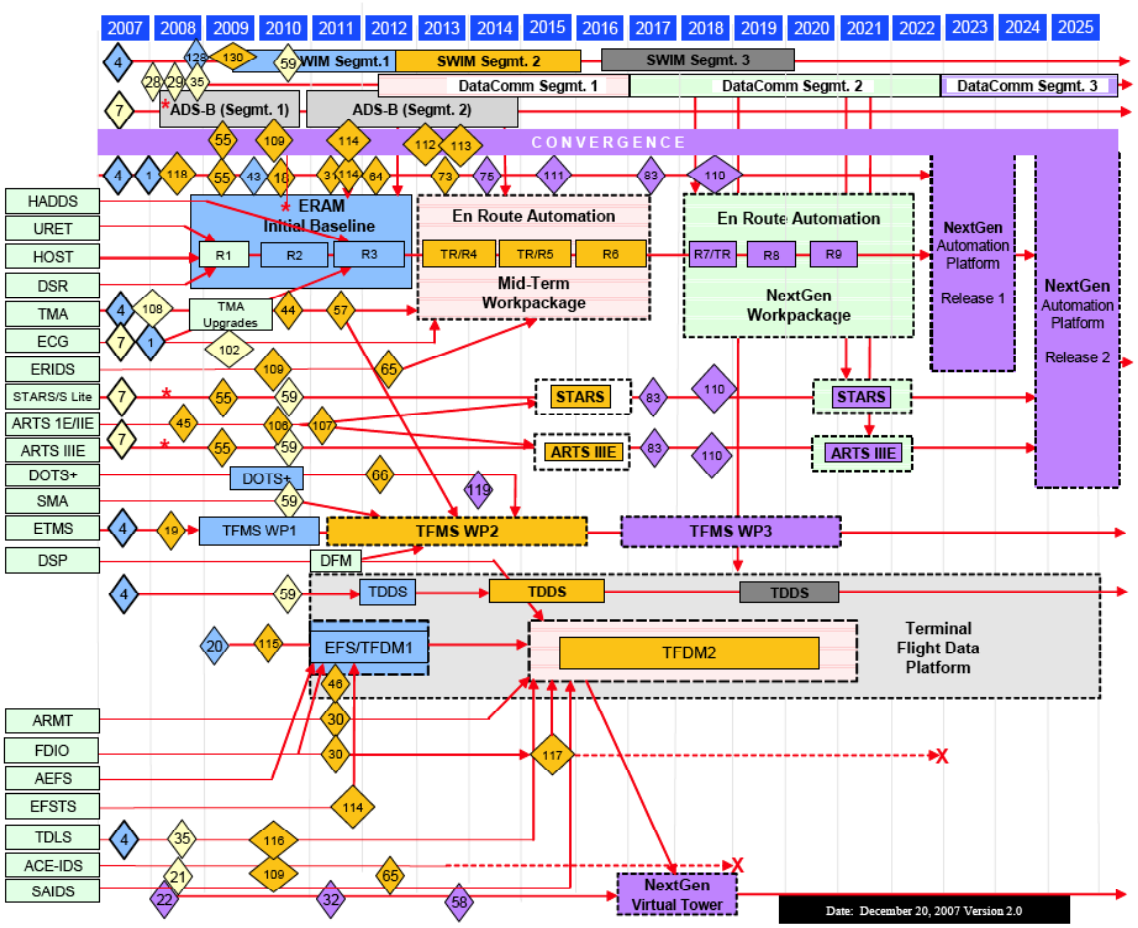
SWIM will facilitate the exchange of information between various information systems at the FAA. The SWIM system is expected to combine flight and flow data, weather information, surveillance, aeronautical information and NAS system management. According to the FAA roadmap there are three segments for SWIM. These segments represent a natural progression of technologies and capabilities added to the system into the future.

DataComm is a set of technologies that will enhance air traffic controller productivity improvements. DataComm requires hardware and software solutions to automate repetitive ATC controller tasks and replaces voice communications with data-link transmissions between pilots and controllers. Studies conducted by the FAA demonstrate that with a large fraction (more than 70%) of aircraft equipped with data-link capabilities, enroute air traffic controllers could handle 30% more traffic than using traditional voice-communication methods. DataComm is a key technology to support NextGen's aircraft trajectory-based operations and super-density arrival and departure operations at airports.

Figure 7-11 illustrates the consolidation of enroute automation ATC services into the En Route Automation and Modernization (ERAM) program starting in 2009 (see Figure 7-10). The following services are integrated into ERAM: 1) the Host Air Traffic Management Data Distribution System (HADDS), 2) the User Request Evaluation Tool (URET), 3) the Host Computer, 4) the Display Replacement System (DSR), 5) the En route Communications Gateway (ECG), and 6) Traffic Management Advisor (TMA). Three iterations of ERAM are planned before consolidation of all enroute services into the NextGen Automation Platform (NAP R1). The FAA plans to consolidate some airport terminal area services into the NextGen Automation Platform (NAP R2) in the 2023 time frame. Services such as the Automated Radar Terminal System (ARTS) and the Standard Terminal Automation Replacement System (STARS) will consolidate most of the terminal area hardware and software into a single platform (NAP R2).

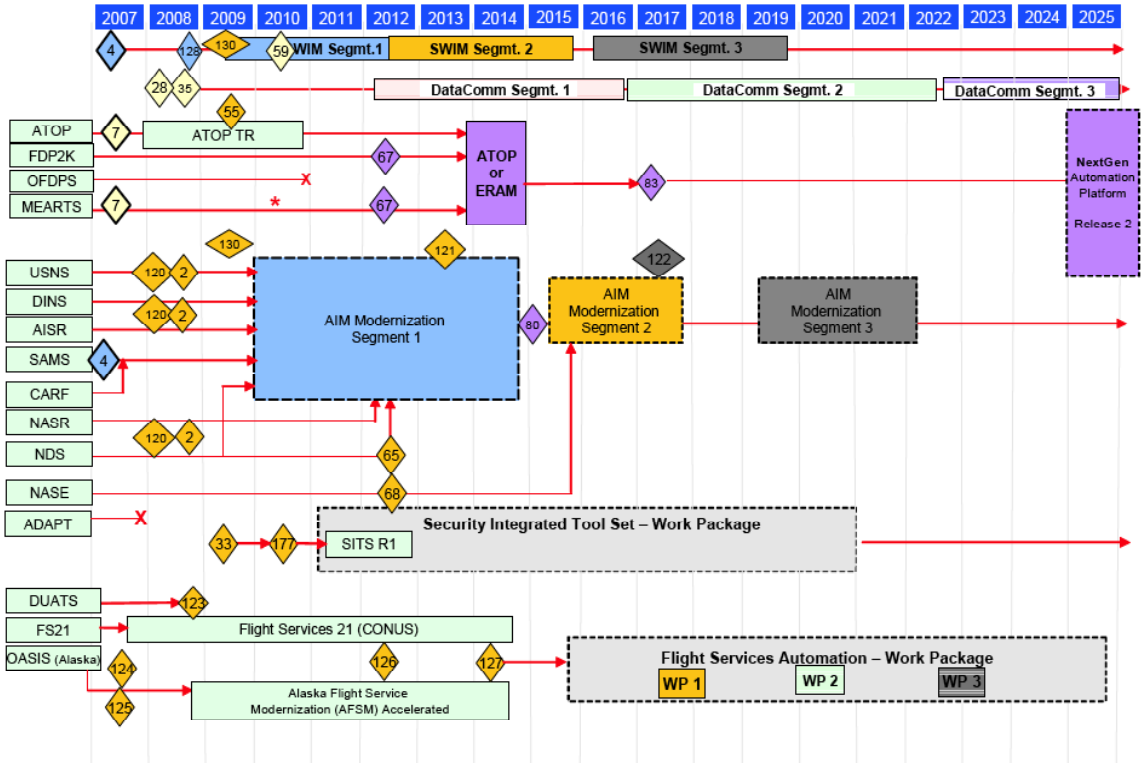
Figure 7-11 illustrates further consolidation in the tower and TRACON services offered today. For example, the FAA is expected to integrate 6 tower and TRACON services shown at the bottom of Figure 7-11 into the Terminal Flight Data Platform (TFDP).

Figure 7-11 – Automation and Communications Roadmap



source: FAA, 2008

Figure 7-12 – Automation and Communications Roadmap



source: FAA, 2008

The top of Figure 7-12 shows services for oceanic en route air traffic control consolidated as the Advanced Technologies and Oceanic Procedures (ATOP) system around 2013. Similarly, the figure illustrates how eight important services will be consolidated into the Aeronautical Information management (AIM) system. These services are used by pilots and ATC controllers to understand the status of the NAS. These services include: the NOTAM System (USNS), the Defense Internet NOTAM Service (DINS), the Aeronautical Information System Replacement (AISR), the Special Airspace Management System (SAMS), the Central Altitude Reservation Facility (CARF), the National Airspace System Resources (NASR), the NOTAM Distribution System (NDS), and the NAS Adaptation Services Environment (NASE).

The current Flight Services Automation System (FS-21) provides flight information advisories to pilots. This service was contracted by the FAA in 2007. In the 2015 timeframe, FS-21 will be consolidated into the Flight Services Automation Work Package (see Figure 7-12).

GENERAL AUTOMATION AND COMMUNICATIONS ROADMAP RECOMMENDATIONS:

The FAA Automation and Communications roadmap will impact how pilots and ATC controllers process and receive aeronautical information. While most of the activities in this roadmap are outside the control of the DOAV, the collection and dissemination of aeronautical data is an important component where Commonwealth resources will play a role.

The recommendations for new remote transmitter (RTR) facilities and ground communication outlets (GCOs) will provide better communication with approach control or fight service stations.

Many of the surveillance improvement available in an ADS-B world will only be realized when FAA provides ATC ARTCC controllers with dual-surveillance displays similar to those installed in Alaska for the Capstone program. Since the integration of ADS-B and traditional radar displays is inherent in the upgrade of ATC tools such as ERAM, we do not consider this to be a show stopper for improving ATC systems in the future around the Commonwealth of Virginia.

WEATHER ROADMAP

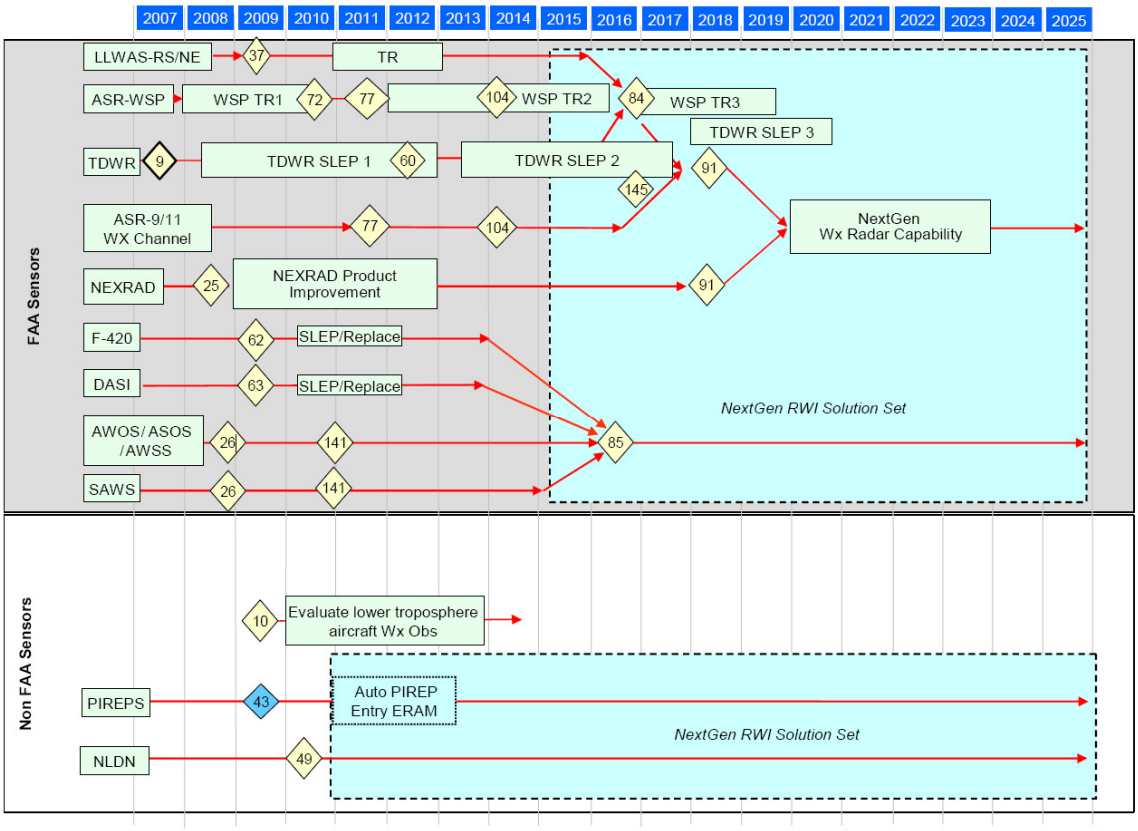
The following Weather Roadmap discussion is excerpted from the FAA's National Airspace System Capital Investment Plan for 2009 through 2013

"Weather information is essential to aviation. Pilots need to know the effect winds aloft will have on their speed and whether there will be sufficient visibility for them to land at their destination airport. Pilots also use weather information to determine if they need to fly a different route to avoid severe weather, like thunderstorms and turbulence that can damage aircraft and potentially injure passengers. The FAA has a significant role in collecting and distributing weather data. The FAA distributes weather hazard information from its own systems and from the National Weather Service to air traffic control facilities, pilots, airline operations centers, and other aviation-related facilities. Because of its impact on an aircraft's speed, weather data is essential for computing the 4D trajectories used in the NextGen system.

"There are two major categories of weather information systems. The first is the weather sensors that measure several atmospheric parameters, including temperature, wind speed and direction, relative humidity and cloud heights. Sensors provide real-time information to air traffic facilities and to centralized weather forecasting systems. The second category is weather processing and display systems, which integrate data from the sensors, forecast weather patterns, and create weather graphics for air traffic displays. An advanced feature enables some systems to project the future movement of weather affecting operations. Figure 7-13 shows the current and planned status of weather sensors.

"FAA sensors shown in the roadmap include the Low Level Wind Shear Alert System (LLWAS); the Airport Surveillance Radar - Weather System Processor (ASR-WSP); and the Terminal Doppler Weather Radar (TDWR), which all detect wind conditions near the surface of the airport to warn pilots of gust fronts and wind shear. The ASR-9/11 Weather (Wx) Channel and the Next Generation Weather Radar (NEXRAD) detect precipitation, wind and thunderstorms that affect aircraft in flight. The F-420 and the Digital Altimeter Setting Indicator (DASI) are located in FAA facilities and display the current wind and barometric pressure for controllers. The Automated Weather Observing Systems (AWOS/ASOS/SAWS) measure weather parameters on the surface to report conditions to air traffic facilities and pilots and also assist in weather forecasting.

Figure 7-13 - Weather Sensor Roadmap (1 of 2)



source: FAA, 2008

"Of the three different sensors that can detect wind shear, the most sophisticated is the TDWR. There are 47 of these radars, and most are located within 10 miles of a runway end. Using Doppler technology, the radars can detect the rapid changes in wind speed and direction that indicate wind shear hazards for an aircraft approaching a runway. For medium-sized airports that don't qualify for a TDWR, a lower cost alternative is the Weather System Processor (WSP), which interprets data from the terminal surveillance radar to identify wind shear. To supplement these radar systems, LLWAS wind sensors located at 6 to 10 points around the runways measure surface wind direction and velocity. The LLWAS wind sensors and the associated computer systems determine whether significant changes in the wind at different locations near the airport present a wind shear hazard to aircraft. LLWASs serve locations that do not have a TDWR or WSP as well as locations where they supplement the radars with point-specific wind measurements to verify the presence and location of wind shears. The roadmap shows that the FAA will perform a service life extension on the TDWR and technical refresh on the LLWAS and ASR-WSP and decide in the 2018 timeframe whether to replace all of them with a NextGen weather radar system.

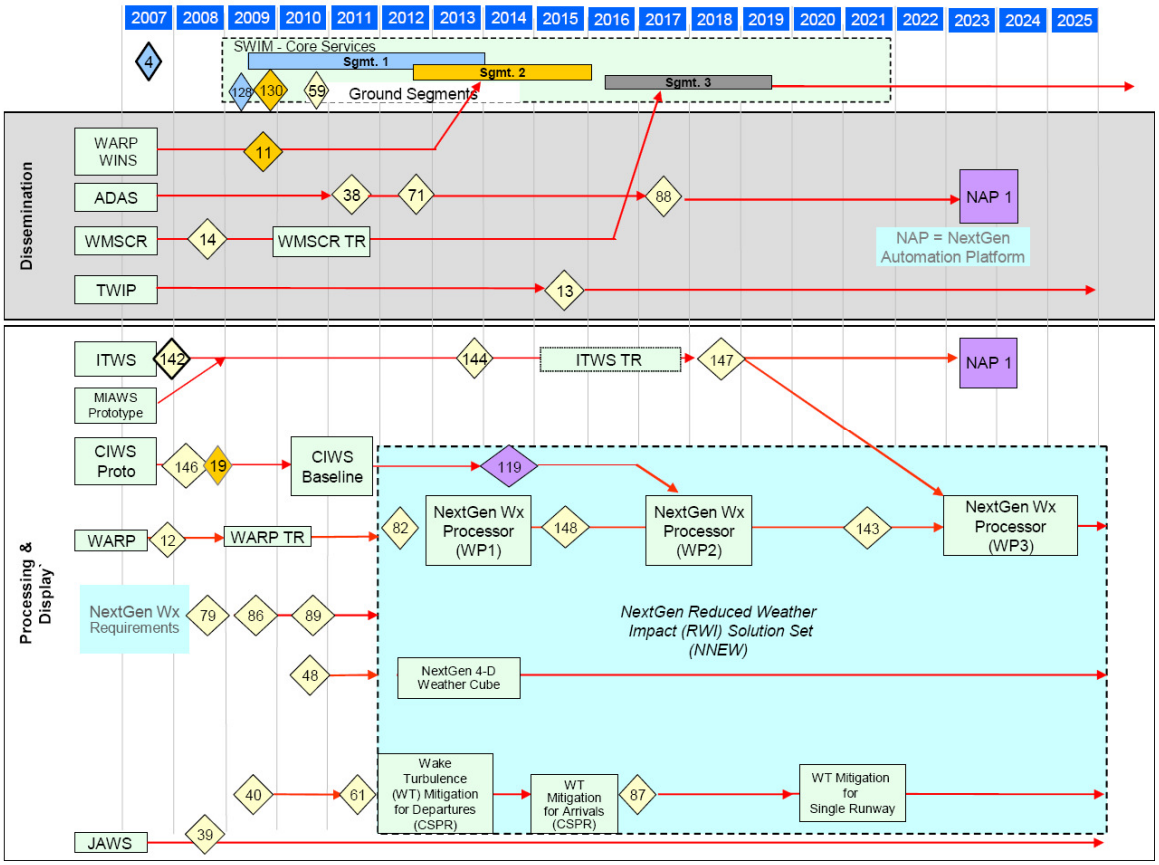
"Replacing the ASR-9/11 weather channel will be necessary only if the ASR-9/11 do not remain in operation. The FAA plans to decide by 2018 whether to incorporate these functions into the NextGen terminal weather radar. The NEXRAD was developed under a joint DOC National Weather Service, Department of Defense (DoD), and FAA program. These systems are Doppler weather radars that collect atmospheric weather conditions over a broad area and are essential for forecasting future weather. In

the short term we are installing upgrades such as Dual Polarization (Dual Pol) and software improvements. Working with our partner agencies we will also decide by 2018 whether to incorporate NEXRAD into the NextGen terminal weather system.

"The Automated Surface Observing Systems (ASOS) and other variants - such as the Automated Weather Observing System (AWOS) and the Stand Alone Weather Sensing (SAWS) system have up to 14 sensors that measure weather data. These systems feed data directly to air traffic control facilities and support automated broadcast of weather information to pilots. They also provide regular updates for the forecast models that predict future weather problems. The Digital Altimeter Setting Indicator (DASI) displays current altimeter settings in the tower. The F-420 is a wind sensor that measures the wind near the runway. These sensors will require updating, and we plan to work with our partner agencies and decide how their functions are incorporated into the NextGen Reduce Weather Impact solution set.

"Pilot reports (PIREPS) of weather conditions can be transmitted by voice or automated systems to FAA facilities. The FAA is studying whether these reports can be transmitted directly to air traffic automation systems in the future. The National Lightning Detection Network (NLDN) reports on the location of lightning strikes. The existing system or a modernized system will continue operating through 2025.

Figure 7-14 – Weather Dissemination, Processing and Display Roadmap (2 of 2)



source: FAA, 2008

Figure 7-15 shows the planned expenditures included in the CIP for weather sensors and weather dissemination and processing systems. (Out-year funding amounts are estimates that assume enactment of the Administration's reauthorization proposal to reform FAA's financing system by adopting cost-based user fees and fuel taxes for the costs of air traffic services.)

Figure 7-15 – Expenditures in the Weather Functional Area (expenditures in millions)

BLI Number	Program Name	FY 2009 Budget	FY 2010	FY 2011	FY 2012	FY 2013
	Weather Functional Area	**$63.1**	**$119.7**	**$125.0**	**$123.8**	**$131.8**
1A06	NextGen Network Enabled Weather (NNEW)	$20.0	$25.0	$25.0	$25.0	$25.0
1A12	Next Generation Air Transportation System (NextGen)-Reduced Weather	$14.4	$62.0	$62.0	$64.1	$100.7
2A03	Next Generation Weather Radar (NEXRAD)	$3.0	$3.0	$3.0	$3.0	$0.0
2A12	Corridor Integrated Weather System (CIWS)	$5.9	$8.4	$17.4	$22.7	$4.0
2B02	Terminal Doppler Weather Radar (TDWR) - Provide	$6.1	$9.9	$8.6	$7.7	$2.1
2B16	Weather System Processor (WSP)	$0.7	$0.3	$0.0	$0.0	$0.0
2B21	Integrated Terminal Weather Systems (ITWS)	$4.5	$4.4	$2.3	$0.0	$0.0
2C01	Automated Surface Observing System (ASOS)	$8.5	$6.7	$6.7	$1.3	$0.0

source: FAA, 2008

"The FAA plans to consolidate weather processing, display and dissemination systems into the NextGen systems (Figure 7-14) that capture and process weather data and then integrate that data into the decision software for advanced automation capabilities.

"The Weather and Radar Processor (WARP) used in en route control facilities receives information from Next Generation Weather Radars (NEXRAD), from automated weather sensors located at airports, and from other sources such as weather satellites. It compiles the information for interpretation by the Center Weather Service Unit forecasting stations. WARP also feeds data to controllers' displays. The Automated Weather Observation Data Acquisition System (ADAS) is a radio link that transmits AWOS/ASOS/SAWS data to air traffic facilities. The Weather Information Network Server (WINS) stores NEXRAD data, which will be distributed by SWIM once it is operational. The Weather Message Switching Center Replacement (WMSCR), operated by the FAA, is a network with terminal nodes in Salt Lake City and Atlanta that collects and distributes weather information. The Terminal Weather Information for Pilots (TWIP) system transfers weather information to FAA facilities and the airline's communication provider for use in analyzing weather conditions. Current planning shows that the first four systems shown on the roadmap will become part of the SWIM network to distribute weather data during Segment 2. The TWIP may stay a separate system, but the FAA will decide during 2015 whether to integrate the system into the SWIM Air Segment.

"The Integrated Terminal Weather System (ITWS) consolidates weather information from automated sensors and surrounding radars to provide real-time weather information for terminal control facilities. The system also projects movement of severe weather systems up to 20 minutes into the future. Tower and Terminal Radar Approach Control (TRACON) controllers use the information to make more precise estimates of when runways should be closed and subsequently reopened. They also use the information to plan for a switch in terminal arrival patterns to avoid excessive maneuvering to accommodate a runway change as aircraft approach an airport. The ITWS has been installed at 22 airports, and it will receive technical refresh in the near term. The ITWS weather inputs and processing power will become part of the NextGen Automation Platform by 2022.

“The Medium Intensity Airport Weather System (MIAWS) prototype uses weather information from the airport surveillance radars to fulfill some of the same functions as the ITWS at smaller airports where it is not economical to install an ITWS. Its functions will be integrated with the ITWS program.

“The Corridor Integrated Weather System (CIWS) gathers weather information occurring along the busiest air traffic corridors to help controllers select the most efficient routes when they must divert traffic to avoid severe weather conditions. The CIWS prototype tested a predictive capability to refine the decisions on when normal routes will be available. This system will become part of the NextGen Weather Processor and support the Traffic Flow Management automation software.

“The NextGen Weather Processor will incorporate the functionality of the existing Weather and Radar Processing (WARP) system. Work Package 2 (WP 2) will enhance the display of weather information by using new algorithms to portray icing conditions, turbulence, and other hazards. The ITWS functions will be incorporated as part of WP 3. Further upgrades of weather predicting algorithms will also be added in WP 3 to include Wind Shear/Microburst and Wake Vortex Detection and prediction advisories.

“The NextGen 4D Weather Cube is a distributed “virtual” database that will receive weather data directly from sensors and other sources, and either automatically, or by request, send data to FAA facilities so that observations and forecasts can be more widely and consistently distributed to a broad set of users via network enabled operations. The 4D Weather Cube will be part of the NextGen Networked Enabled Weather program and supports the Reduce Weather Impact solution set.

“The Wake Turbulence program is developing technology-based solutions to safely reduce the present aircraft separation applied to mitigate wake vortex impacts. Currently controllers must maintain a set distance between aircraft to ensure a low likelihood that the following aircraft could encounter wake turbulence. The technology solutions focus on using knowledge of how wakes move laterally with crosswinds. The first product, Wake Turbulence for Departures (WTMD), is a controller decision support tool for use with departure operations on closely spaced parallel runways (CSPR). When there is a persistent crosswind, the WTMD will indicate that it is safe to allow a departure after a heavy aircraft departs on an adjacent CSPR. As shown in Figure 7-14 (Weather Dissemination, Processing and Display Roadmap) the next expected product will be a crosswind decision support tool that will be used for approaches to CSPR. In future years, the FAA will develop equipment that addresses a potential reduction in separation standards for single and multiple runway operations during both approaches and departures.

“The Juneau Airport Weather System (JAWS) uses wind sensors to detect and transmit turbulence and dangerous wind alerts to air traffic facilities near the Juneau airport. The approach and departure routes for Juneau follow a narrow channel between two mountain ranges. Detecting and transmitting information on the wind conditions along these routes help ensure safe operations for aircraft arriving and departing this airport.

WEATHER ROADMAP RECOMMENDATIONS

The recommended steps to equip additional airports with AWOS and transmit their observations for national dissemination will not only help operators and pilots flying in Virginia, but also holds the possibility of improving weather reports and forecast nationally, if the facilities are included in the NADIN. As the FAA plans to invest in Automated Surface Observation Stations (ASOS) in the period from

2009 through 2012, it is recommended that the DOAV re-examine the FAA's specific ASOS plans as they are issued during the period from 2009 through 2012 a part of it planning for support of AWOSs recommended for use throughout Virginia.

REFERENCES

1) Joint Planning and Development Office, Concept of Operations for the Next Generation Air Transportation System (version 2.0), Washington, D.C., June 13, 2007.
2) Joint Planning and Development Office, Enterprise Architecture v. 2.0 for the Next Generation Air Transportation System, Washington, D.C., June 22, 2007.
3) Joint Planning and Development Office, Integrated Workplan for the Next Generation Air Transportation System (version 0.2), Washington, D.C., February 2008.
4) Kayton, M. and Friedman, W., Aviation Navigation Systems: Second Edition, Wiley Interscience, New York, 1997.
5) International Civil Aviation Organization, Tenth Meeting of the Communications/Navigation/Surveillance and Meteorological Subgroup of APANPIRG, Bangkok, July 2006.
6) Valovage, E., Enhanced ADS-B research, IEEE aerospace and electronic systems magazine, Vol. 22, Issue 5, 2007.
7) RTCA, Minimum Aviation System Performance Standards for Automatic Dependent Surveillance Broadcast (ADS-B), Document DO-242A, RTCA SC-186, June 25, 2005.
8) Automatic Dependent Surveillance-Broadcast Aviation Rulemaking Committee, Optimizing the Benefits of Automatic Dependent Surveillance-Broadcast, Washington, D.C., October 17, 2007.
9) Dunstone, G., Owusu, K. and Hewitt, K., Australian Strategic Air Traffic Management Group ADS-B Implementation Team, Air Services Australia, Canberra, July 2007.
10) Federal Aviation Administration, National Airspace System Capital Investment Plan: Fiscal Years 2009-2013, Washington, DC, May 2008.
11) Department of Transportation, Radio Navigation Plan 2005, Washington, DC, June 2005.
12) Aircraft Owners and Pilots Association, FAA Intents to Reduce the VOR Network Soon, August 28, 2008.
13) Federal Aviation Administration, Air Traffic Services Bulleting, Issue 2005-3, Washington, DC, August 2005.

CHAPTER 8 – FUNDING PROGRAM AND PRIORITY SYSTEM

This section discusses the current funding program, considerations for funding the myriad of recommendations contained in the Study, and presents a quantitative system for the prioritization of the projects.

OVERVIEW OF EXISTING FUNDING PROGRAM

As described in the Virginia Department of Aviation's(DOAV) *Airport Program Manual* (July, 2008), the Facilities and Equipment Program provides funding for the installation of electronic communication, navigation, and information systems that enhance the safety of flight and the utilization of Virginia's air transportation system. The Program states that the DOAV "will own and maintain some of these systems, and for others, a Sponsor will have ownership and be responsible for system maintenance."

To be eligible for funding consideration, a project must meet the general project eligibility requirements and must also be identified in the DOAV's current "Facilities and Equipment Plan." The Airport Program Manual provides the following list of eligible projects.

Table 8-1 – Facilities and Equipment Program – Examples of Eligible Projects

DOAV Owned	Sponsor Owned
• Localizer • Glideslope to complete CAT I ILS • Distance Measuring Equipment (DME) • Non-directional beacon (NDB) • Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR) • Automated Weather Observation Systems (networking equipment ONLY) • UNICOM transceivers	• Obstruction marking and lighting • Retro-reflective markers for taxiways and ramps • Centerline retro-reflective markers • Visual approach guidance aids • Rotating beacons • Wind cones • Segmented circles • Precision approach path indicators (PAPIs) • Runway end identifier lights (REILs) • Omni directional approach light systems (ODALS) • Medium intensity runway lights (MIRLs) • High Intensity runway lights (HIRLs) • Medium Intensity taxiway lights (MITLs) • Runway or taxiway closure lighted marking ("X") • Weather observation systems • Pilot weather briefing systems • Ground communication outlets (GCOs) • Pilot-controlled lighting (PCL) systems

source: DOAV Airport Program Manual (2008)

Historically, the majority of the projects funded through the Facilities and Equipment Program have been navigational aids, weather systems or communication systems. Projects such as runway and taxiway edge lights have typically been funded through the DOAV's Airport Capital Program.

CONSIDERATIONS FOR FUNDING IMPROVEMENTS

The existing *Airport Program Manual* can continue to be used to address funding eligibility for both the system-wide and airport-specific recommendations contained throughout this Study.

FACILITIES AND EQUIPMENT PRIORITY SYSTEM

The Technical Committee worked together as part of the Study to develop a customized system for prioritizing projects that will be funded through the Facilities and Equipment program. The system has been modeled to be similar to the existing priority system for the Airport Capital Program and has three primary components: airport-related, procedure-related, and project-related.

Table 8-2 – Facilities and Equipment Priority System

AIRPORT RELATED ITEMS	Study Role	Points
	Commercial Service (all)	30
	Reliever	30
	General Aviation Regional (1/2 mile or ¾ mile visibility)	25
	General Aviation Regional (1 mile visibility)	20
	General Aviation Community	10
	Local Service	0
	Airport Activity Level (pick highest)	Points
	100+ based aircraft or 500,000+ scheduled enplanements	25
	50 to 99 based aircraft or 250,000 to 499,000 scheduled enplanements	20
	20 to 49 based aircraft or 50,000 to 249,000 scheduled enplanements	15
	11 to 19 based aircraft or 1,000 to 49,000 scheduled enplanements	10
	0 to 10 based aircraft or less than 1,000 scheduled enplanements	5
	Special Features	Points
	Designated Tier 1 or 2 Emergency Airport or Regular Medical Operations	10
	Airports with exceptionally high landing minima for best approach (Air Carrier >200 DA, Reliever >300 DA or MDA, Regional >400 DA or MDA, Community >500 MDA)	10
	Both	20
	Obstructions	Points
	Airport has unmitigated obstructions to threshold siting surface	(200)
PROCEDURE-RELATED ITEMS	**System Goals (Benchmarks)**	**Points**
	Improvement needed to meet system goal on primary runway	20
	Improvement needed to meet system goal on secondary runway	10
	Improvement needed to meet system goal on other runway end	0
	Lower Visibility or MDA / DA for Runway	Points
	Improvement lowers visibility for any approach category	30
	Improvement is expected to lower landing ceiling by 200+ feet	30
	Improvement is expected to lower landing ceiling by 100 to 199 feet	20
	Improvement is expected to lower landing ceiling by 1 to 99 feet	10
	No change to landing minimum is expected	0
	AC 150/5300-13, Appendix 16 Requirements	Points
	Currently meets requirements	30
	Will meet requirements at completion of project	15
	Does not meet requirements	0

	Project Type	Points
PROJECT RELATED ITEMS	Facility Replacement / Maintenance	50
	FIX: Request Step-Down Fix	50
	Lighting: Airfield Lighting Control	50
	Procedure: Airport Identifier	50
	Procedure: Altimeter Source (Review RASS)	50
	Procedure: Procedure Review	50
	Request New Procedures (On Existing VORs)	50
	AWOS: Sensor Replacement	50
	AWOS: Altimeter Source	45
	AWOS: New AWOS	45
	AWOS: Upgrade AWOS (new sensors)	40
	Communications: Signs	40
	New IAP: Aeronautical Survey	40
	New IAP: New Satellite Based Procedure	40
	Verify Critical Obstacle (Accuracy Code)	40
	Communications: GCO	35
	Communications: RTRs	30
	DME: New DME (FAF or Step-Down Fix)	30
	LOC: New Localizer	30
	PAPI: New PAPIs	30
	REILs: New REILs	30
	RVR	30
	ALS: New Approach Lighting System	25
	ALS: Upgrade Approach Lighting System	20
	DME: New DME (Situational Awareness)	20
	Marker Beacon (No DME, Complex Approach)	20
	PAPI: Upgrade PAPI	20
	Datalink (ADS-B)	10
	GS: Glide Slope	10
	ILS: New ILS	10
	LAAS	10
	Lighting: Install MIRLs	5
	Lighting: Install TDZ, CL	5
	Lighting: Upgrade MIRLs, HIRLs	5
	Radar Coverage	5
	VORTAC Repair	5

source: Consultant Recommendation

note: Any new development funded in part or full by FAA programs should be designed in accordance with the guidance provided in FAA AC 150-5300-13, Airport Design

As part of the Study, a priority system interface was developed using Microsoft Access and provided to the DOAV. This tool contains the priority system elements and was used to prioritize the applicable recommendations from the Study. The results are presented in the following chapter. Additionally, the tool can be utilized by the DOAV in the future when additional projects are added to the Plan.

CHAPTER 9 – IMPLEMENTATION PLAN

This section synthesizes all of the recommendations contained in the Study and presents a comprehensive implementation plan for the Virginia Department of Aviation's (DOAV) use.

The recommendations presented herein are intended to serve as an independent study prepared for the DOAV's review and consideration. These recommendations are not intended to take the place of individual airport master plans, environmental or capital improvement planning processes. The contents of this Study do not reflect the official views of the FAA or DOAV, nor are the FAA and DOAV endorsing the Study's recommended improvements and timelines for programming and funding.

If an airport Sponsor would like to pursue improvements contained in this Study, they should work with their representatives at the FAA Airports District Office and the DOAV to develop a mutually acceptable development program. All improvements will be required to meet FAA Airport Improvement Program (AIP) eligibility requirements if Federal AIP funding is desired.

CATEGORIZATION OF RECOMMENDATIONS

Each of the recommendations contained in the Study can be categorized in one of the following ways:

1. Recommendations Currently Underway
2. Recommendations for Immediate Action
3. Recommended Projects Best Suited for Facilities and Equipment Program
4. Recommendations Which Cannot Be Completed Until Other Projects are Accomplished
5. Recommendations Which are Technology-Dependent
6. Recommended Projects Well-Suited for Other Funding Programs

Accordingly, the recommendations have been divided into the above categories and presented in the following sections below.

CURRENTLY UNDERWAY

The recommendations listed below are currently underway as part of various projects and programs. The list is presented in order by airport name.

Table 9-1– Recommendations Currently Underway

Airport Name	ID	Recommended Improvement
Blue Ridge	MTV	Request aeronautical survey to enable development of approaches.
Chesterfield County	FCI	Request aeronautical survey to enable development of approaches.
Culpeper Regional	CJR	Request aeronautical survey to enable development of approaches.
Dinwiddie County	PTB	Request aeronautical survey to enable development of approaches.
Farmville Regional	FVX	Request aeronautical survey to enable development of approaches.
Hanover County Municipal	OFP	Request aeronautical survey to enable development of approaches.

Airport Name	ID	Recommended Improvement
Ingalls Field	HSP	Request aeronautical survey to enable development of approaches.
Lee County	0VG	Install AWOS-III.
Leesburg Executive	JYO	Install glide slope to complete ILS RWY 17.
Lonesome Pine	LNP	Install glide slope to complete ILS RWY 24.
Marks Municipal	W63	Request aeronautical survey to enable development of approaches.
Tazewell County	6V3	Install localizer and request development of LOC RWY 25 approach.
Warrenton-Fauquier	HWY	Request FAA commissioning of AWOS-III.
Warrenton-Fauquier	HWY	Commission ILS RWY 14 approach.
Winchester Regional	OKV	Request aeronautical survey to enable development of approaches.

source: Consultant Recommendation

NEAR-TERM IMPROVEMENTS (6 YEAR PLAN)

The recommendations listed in the table below are those have been identified as immediate, high-priority projects for the DOAV's consideration. The majority of the projects listed are relatively low-cost and the recommendations are listed in order by airport name.

Table 9-2 – Immediate, High-Priority Recommendations (Years One and Two)

YEARS 1 & 2 Airport Name	ID	Recommended Improvement	Est. Cost
Accomack County	MFV	Request development of RNAV (GPS) RWY 21 Approach with LPV and LNAV landing minimums.	$0
Accomack County	MFV	Field verify critical obstacle to change accuracy code from "D" to "A" or 50 feet to 3 feet. (Runway 3)	$10,000
Accomack County	MFV	Request development of RNAV (GPS) RWY 3 Approach with LPV landing minimums.	$0
Accomack County	MFV	Request procedure be modified to eliminate ADF requirement. (Runway 3)	$0
Accomack County	MFV	Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	$5,000
Accomack County	MFV	Replace problematic localizer. (Runway 3)	$100,000
Accomack County	MFV	Request commissioning of Wallops ASR Radar.	
Blackstone Municipal	BKT	Request addition of Approach Category D minimums to the procedure. (Runway 4)	$0
Blackstone Municipal	BKT	Request addition of Approach Category D minimums to the procedure. (Runway 22)	$0
Blackstone Municipal	BKT	Request development of RNAV (GPS) RWY 4 Approach with LPV landing minimums.	$0
Blackstone Municipal	BKT	Request development of VOR/DME - B approach.	$0
Blackstone Municipal	BKT	Change control sequence and/or facility directory note for MIRLs to be preset on low intensity with higher intensity activated on CTAF.	$10,000
Blackstone Municipal	BKT	Close Runway 1-19.	$0

YEARS 1 & 2 Airport Name	ID	Recommended Improvement	Est. Cost
Blackstone Municipal	BKT	Field verify critical obstacle to change accuracy code from "D" to "A" or 50 feet to 3 feet. (Runway 4)	$10,000
Blackstone Municipal	BKT	Request procedure be updated to delete "MIRL RWY 1-19" note.	$0
Blackstone Municipal	BKT	Verify and update the facility directory and approach plate diagrams to show existing runway lengths and displaced landing thresholds.	$0
Blackstone Municipal	BKT	Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	$5,000
Blackstone Municipal	BKT	Field verify critical obstacle to change accuracy code from "D" to "A" or 50 feet to 3 feet. (Runway 22)	$10,000
Blackstone Municipal	BKT	Install a Ground Communication Outlet (GCO) directly with Washington Center.	$20,000
Blue Ridge	MTV	Request development of RNAV (GPS) RWY 12 Approach with LPV landing minimums.	$0
Blue Ridge	MTV	Change control sequence and/or facility directory note for MIRLs to be preset on low intensity with higher intensity activated on CTAF.	$10,000
Blue Ridge	MTV	Confirm presence of REILs and ODALS; remove REILs. (Runway 30)	$10,000
Blue Ridge	MTV	Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	$5,000
Blue Ridge	MTV	Replace problematic localizer. (Runway 30)	$100,000
Bridgewater Air Park	VBW	Change control sequence and/or facility directory note for MIRLs to be preset on low intensity with higher intensity activated on CTAF.	$10,000
Bridgewater Air Park	VBW	Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	$5,000
Bridgewater Air Park	VBW	Request development of RNAV (GPS) RWY 15 or RNAV (GPS) RWY 33 or circle-to-hand approach with LP and/or LNAV landing minimums.	$0
Brookneal-Campbell County	0V4	Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	$5,000
Brookneal-Campbell County	0V4	Request development of RNAV (GPS) RWY 6 Approach with LP or LPV landing minimums.	$0
Brookneal-Campbell County	0V4	Install a Ground Communication Outlet (GCO) directly with Roanoke Approach.	$20,000
Charlottesville-Albemarle	CHO	Request localizer procedure be modified to include step-down fix. (Runway 3)	$0
Charlottesville-Albemarle	CHO	Field verify critical obstacle to change accuracy code from "D" to "A" or 50 feet to 3 feet. (Runway 3)	$10,000
Charlottesville-Albemarle	CHO	Verify removal of close-in obstacle on the ILS missed approach segment. (Runway 3)	$0
Charlottesville-Albemarle	CHO	Request development of RNAV (GPS) RWY 3 Approach with LPV landing minimums. (Runway 3)	$0
Chase City Municipal	CXE	Request deletion of Approach Category C minimums from the procedure. (Runway 36)	$0

YEARS 1 & 2 Airport Name	ID	Recommended Improvement	Est. Cost
Chase City Municipal	CXE	Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	$5,000
Chase City Municipal	CXE	Request deletion of Approach Category C minimums from the procedure. (Runway 18)	$0
Chase City Municipal	CXE	Install a Ground Communication Outlet (GCO) directly with Washington Center.	$20,000
Chesapeake Regional	CPK	Request addition of Approach Category C and D minimums to the procedure. (Runway 5)	$0
Chesapeake Regional	CPK	Request development of RNAV (GPS) RWY 23 Approach with LPV and LNAV landing minimums.	$0
Chesapeake Regional	CPK	Change control sequence and/or facility directory note for HIRLs to be preset on low intensity with higher intensity activated on CTAF.	$10,000
Chesapeake Regional	CPK	Request development of RNAV (GPS) RWY 5 Approach with LPV landing minimums.	$0
Chesapeake Regional	CPK	Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	$5,000
Chesterfield County	FCI	Request development of RNAV (GPS) RWY 15 Approach with LPV landing minimums.	$0
Chesterfield County	FCI	Field verify critical obstacle for localizer approach to change accuracy code from "D" to "A" or 50 feet to 3 feet. (Runway 33)	$10,000
Chesterfield County	FCI	Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	$5,000
Chesterfield County	FCI	Repair REILs and eliminate AFD note "Runway 15 REILS OTS indef".	$50,000
Chesterfield County	FCI	Request development of VOR/DME RWY 15 (FAK VORTAC) or VOR/DME-A (RIC VORTAC) approach.	$0
Chesterfield County	FCI	Connect existing AWOS-III to NADIN system.	$5,000
Culpeper Regional	CJR	Request addition of Approach Category D minimums to the procedure. (Runway 4)	$0
Culpeper Regional	CJR	Request development of RNAV (GPS) RWY 22 Approach with LPV and LNAV landing minimums.	$0
Culpeper Regional	CJR	Change control sequence and/or facility directory note for MIRLs to be preset on low intensity with higher intensity activated on CTAF.	$10,000
Culpeper Regional	CJR	Request procedure be modified to eliminate ADF requirement. (Runway 4)	$0
Culpeper Regional	CJR	Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	$5,000
Culpeper Regional	CJR	Request development of RNAV (GPS) RWY 4 Approach with LPV and LNAV landing minimums.	$0
Danville Regional	DAN	Change control sequence and/or facility directory note for HIRLs to be preset on low intensity with higher intensity activated on CTAF.	$10,000
Danville Regional	DAN	Request development of RNAV (GPS) RWY 20 Approach with LPV landing minimums.	$0

YEARS 1 & 2 Airport Name	ID	Recommended Improvement	Est. Cost
Danville Regional	DAN	Request development of RNAV (GPS) RWY 13 or RNAV (GPS) RWY 31 Approach with LPV and LNAV landing minimums.	$0
Danville Regional	DAN	Request development of RNAV (GPS) RWY 2 Approach with LPV and LNAV landing minimums.	$0
Danville Regional	DAN	Request procedure title be updated to RNAV (GPS) RWY 20 format.	$0
Dinwiddie County	PTB	Request addition of Approach Category D minimums to the procedure. (Runway 5)	$0
Dinwiddie County	PTB	Request addition of Approach Category D minimums to the procedure. (Runway 23)	$0
Dinwiddie County	PTB	Request procedure be modified to include step-down fix. (Runway 5)	$0
Dinwiddie County	PTB	Change control sequence and/or facility directory note for MIRLs to be preset on low intensity with higher intensity activated on CTAF.	$10,000
Dinwiddie County	PTB	Request procedure be modified to include step-down fix. (Runway 23)	$0
Dinwiddie County	PTB	Request development of RNAV (GPS) RWY 5 Approach with LPV landing minimums. (Runway 5)	$0
Dinwiddie County	PTB	Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	$5,000
Dinwiddie County	PTB	Request development of RNAV (GPS) RWY 23 Approach with LPV landing minimums.	$0
Emporia-Greensville Regional	EMV	Request addition of Approach Category C and D minimums to the procedure. (Runway 33)	$0
Emporia-Greensville Regional	EMV	Request addition of Approach Category C and D minimums to the procedure. (Runway 15)	$0
Emporia-Greensville Regional	EMV	Change control sequence and/or facility directory note for MIRLs to be preset on low intensity with higher intensity activated on CTAF.	$10,000
Emporia-Greensville Regional	EMV	Request development of RNAV (GPS) RWY 15 Approach with LPV and LNAV landing minimums. (Runway 15)	$0
Emporia-Greensville Regional	EMV	Replace problematic localizer. (Runway 33)	$100,000
Emporia-Greensville Regional	EMV	Request development of RNAV (GPS) RWY 33 Approach with LPV landing minimums.	$0
Emporia-Greensville Regional	EMV	Request procedure be modified to eliminate ADF requirement. (Runway 33)	$0
Emporia-Greensville Regional	EMV	Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	$5,000
Emporia-Greensville Regional	EMV	Install a Ground Communication Outlet (GCO) directly with Washington Center.	$20,000
Farmville Regional	FVX	Request addition of Approach Category D minimums to the procedure. (Runway 21)	$0
Farmville Regional	FVX	Request procedure title be updated to RNAV (GPS) RWY 21 format.	$0

YEARS 1 & 2 Airport Name	ID	Recommended Improvement	Est. Cost
Farmville Regional	FVX	Request development of RNAV (GPS) RWY 21 Approach with LPV landing minimums.	$0
Farmville Regional	FVX	Request development of RNAV (GPS) RWY 3 Approach with LPV and LNAV landing minimums.	$0
Farmville Regional	FVX	Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	$5,000
Farmville Regional	FVX	Request procedure be updated to separate GPS approach from ground-based approach. (Runway 3)	$0
Franklin Municipal	FKN	Request procedure be modified to include step-down fix. (Runway 27)	$0
Franklin Municipal	FKN	Request development of RNAV (GPS) RWY 9 Approach with LPV landing minimums.	$0
Franklin Municipal	FKN	Change control sequence and/or facility directory note for MIRLs to be preset on low intensity with higher intensity activated on CTAF.	$10,000
Franklin Municipal	FKN	Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	$5,000
Franklin Municipal	FKN	Field verify critical obstacle to change accuracy code from "D" to "A" or 50 feet to 3 feet. (Runway 9)	$10,000
Front Royal-Warren County	FRR	Request development of RNAV (GPS) RWY 27 Approach with LP or LPV and LNAV landing minimums. Due to terrain, may be circle-to-land procedure.	$0
Front Royal-Warren County	FRR	Add course arrow and note to airport diagram.	$0
Front Royal-Warren County	FRR	Change control sequence and/or facility directory note for MIRLs to be preset on low intensity with higher intensity activated on CTAF.	$10,000
Front Royal-Warren County	FRR	Install a Ground Communication Outlet (GCO) directly with Potomac Approach.	$20,000
Grundy Municipal	GDY	Change control sequence and/or facility directory note for MIRLs to be preset on low intensity with higher intensity activated on CTAF.	$10,000
Grundy Municipal	GDY	Request procedure title be updated to RNAV (GPS) RWY 22 format.	$0
Hampton Roads Executive	PVG	Request development of RNAV (GPS) RWY 10 Approach with LPV landing minimums.	$0
Hampton Roads Executive	PVG	Change control sequence and/or facility directory note for MIRLs to be preset on low intensity with higher intensity activated on CTAF.	$10,000
Hampton Roads Executive	PVG	Request procedure title be updated to RNAV (GPS) RWY 10 format.	$0
Hampton Roads Executive	PVG	Request development of RNAV (GPS) RWY 28 Approach with LPV landing minimums.	$0
Hampton Roads Executive	PVG	Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	$5,000
Hampton Roads Executive	PVG	Request procedure title be updated to RNAV (GPS) RWY 28 format.	$0

YEARS 1 & 2 Airport Name	ID	Recommended Improvement	Est. Cost
Hampton Roads Executive	PVG	Request procedure be updated to separate GPS approach from ground-based approach. (Runway 2)	$0
Hampton Roads Executive	PVG	Connect existing AWOS-III to NADIN system.	$5,000
Hanover County Municipal	OFP	Request development of RNAV (GPS) RWY 34 Approach with LPV and LNAV landing minimums.	$0
Hanover County Municipal	OFP	Change control sequence and/or facility directory note for MIRLs to be preset on low intensity with higher intensity activated on CTAF.	$10,000
Hanover County Municipal	OFP	Replace problematic DME. (Runway 16)	$100,000
Hanover County Municipal	OFP	Request procedure title be updated to RNAV (GPS) RWY 16 format.	$0
Hanover County Municipal	OFP	Request development of VOR RWY 34 Approach (RIC VORTAC).	$0
Hanover County Municipal	OFP	Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	$5,000
Hummel Field	W75	Change control sequence and/or facility directory note for MIRLs to be preset on low intensity with higher intensity activated on CTAF.	$10,000
Hummel Field	W75	Request procedure title be updated to RNAV (GPS) RWY 1 format.	$0
Ingalls Field	HSP	Request development of RNAV (GPS) RWY 7 Approach with LPV landing minimums.	$0
Ingalls Field	HSP	Change control sequence and/or facility directory note for HIRLs to be preset on low intensity with higher intensity activated on CTAF.	$10,000
Ingalls Field	HSP	Request procedure title be updated to RNAV (GPS) RWY 25 format.	$0
Ingalls Field	HSP	Request development of RNAV (GPS) RWY 25 Approach with LPV landing minimums.	$0
Ingalls Field	HSP	Request procedure title be updated to RNAV (GPS) RWY 7 format.	$0
Lawrenceville-Brunswick	LVL	Change control sequence and/or facility directory note for MIRLs to be preset on low intensity with higher intensity activated on CTAF.	$10,000
Lee County	0VG	Request development of RNAV (GPS) RWY 7 Approach with LPV landing minimums.	$0
Lee County	0VG	Request development of RNAV (GPS) RWY 25 Approach with LPV landing minimums.	$0
Lee County	0VG	Change control sequence and/or facility directory note for MIRLs to be preset on low intensity with higher intensity activated on CTAF.	$10,000
Lee County	0VG	Update airport identifier to three letter format.	$0
Lee County	0VG	Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	$5,000
Lee County	0VG	Install a Ground Communication Outlet (GCO) directly with Atlanta Center.	$20,000

YEARS 1 & 2 Airport Name	ID	Recommended Improvement	Est. Cost
Leesburg Executive	JYO	Request development of RNAV (GPS) RWY 35 Approach with LPV and LNAV landing minimums. Procedure may be designed to align with runway centerline or parallel to IAD traffic flow.	$0
Leesburg Executive	JYO	Change control sequence and/or facility directory note for HIRLs to be preset on low intensity with higher intensity activated on CTAF.	$10,000
Leesburg Executive	JYO	Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	$5,000
Lonesome Pine	LNP	Request development of RNAV (GPS) RWY 6 Approach with LPV landing minimums.	$0
Lonesome Pine	LNP	Change control sequence and/or facility directory note for MIRLs to be preset on low intensity with higher intensity activated on CTAF.	$10,000
Lonesome Pine	LNP	Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	$5,000
Lonesome Pine	LNP	Field verify critical obstacle to change accuracy code from "D" to "A" or 50 feet to 3 feet. (Runway 6)	$10,000
Louisa County	LKU	Request addition of Approach Category C and D minimums to the procedure. (Runway 27)	$0
Louisa County	LKU	Request development of RNAV (GPS) RWY 27 Approach with LPV and LNAV landing minimums.	$0
Louisa County	LKU	Request development of RNAV (GPS) RWY 9 Approach with LNAV landing minimums.	$0
Louisa County	LKU	Request procedure be updated to separate GPS approach from ground-based approach. (Runway 27)	$0
Louisa County	LKU	Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	$5,000
Louisa County	LKU	Install a Ground Communication Outlet (GCO) directly with Potomac Approach.	$20,000
Luray Caverns	W45	Request development of RNAV (GPS) RWY 22 Approach with LP or LPV landing minimums.	$0
Luray Caverns	W45	Request development of RNAV (GPS) RWY 4 Approach with LP or LPV and LNAV landing minimums.	$0
Luray Caverns	W45	Change control sequence and/or facility directory note for MIRLs to be preset on low intensity with higher intensity activated on CTAF.	$10,000
Luray Caverns	W45	Request deletion of Approach Category C minimums from the procedure.	$0
Luray Caverns	W45	Field verify critical obstacle to change accuracy code from "D" to "A" or 50 feet to 3 feet. (Runway 22)	$10,000
Luray Caverns	W45	Request procedure title be updated to RNAV (GPS) RWY 22 format.	$0
Luray Caverns	W45	Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	$5,000
Luray Caverns	W45	Install a Ground Communication Outlet (GCO) directly with Washington Center.	$20,000

YEARS 1 & 2 Airport Name	ID	Recommended Improvement	Est. Cost
Lynchburg Regional	LYH	Request development of RNAV (GPS) RWY 22 Approach with LPV landing minimums.	$0
Lynchburg Regional	LYH	Change facility directory note to reflect that HIRLs are preset on low intensity (with higher intensity activated on CTAF) once ATCT is closed.	$0
Lynchburg Regional	LYH	Request development of RNAV (GPS) RWY 17 Approach with LNAV landing minimums.	$0
Lynchburg Regional	LYH	Request development of RNAV (GPS) RWY 35 Approach with LNAV landing minimums.	$0
Lynchburg Regional	LYH	Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	$5,000
Lynchburg Regional	LYH	Request procedure title be updated to RNAV (GPS) RWY 22 format.	$0
Lynchburg Regional	LYH	Request development of RNAV (GPS) RWY 4 Approach with LPV and LNAV landing minimums.	$0
Manassas Regional	HEF	Request development of RNAV (RNP) RWY 16L Approach.	$0
Manassas Regional	HEF	Request localizer procedure be modified to include step-down fix. (Runway 16L)	$0
Manassas Regional	HEF	Request development of RNAV (GPS) RWY 34R Approach with LPV landing minimums.	$0
Manassas Regional	HEF	Request development of RNAV (RNP) RWY 34R Approach.	$0
Manassas Regional	HEF	Change control sequence and/or facility directory note for HIRLs to be preset on low intensity with higher intensity activated on CTAF.	$10,000
Manassas Regional	HEF	Request development of RNAV (GPS) RWY 34L Approach with LNAV landing minimums.	$0
Manassas Regional	HEF	Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	$5,000
Marks Municipal	W63	Request development of RNAV (GPS) RWY 22 Approach with LNAV landing minimums.	$0
Marks Municipal	W63	Field verify critical obstacle to change accuracy code from "D" to "A" or 50 feet to 3 feet.	$10,000
Marks Municipal	W63	Request procedure title be updated to RNAV (GPS) RWY 4 format.	$0
Marks Municipal	W63	Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	$5,000
Marks Municipal	W63	Request development of RNAV (GPS) RWY 4 Approach with LP or LPV landing minimums.	$0
Marks Municipal	W63	Install a Ground Communication Outlet (GCO) directly with Washington Center.	$20,000
Mecklenburg-Brunswick Regional	AVC	Request publication of GCO frequency in the Airport Facility Directory and on instrument approach plates.	$0
Mecklenburg-Brunswick Regional	AVC	Request development of RNAV (GPS) RWY 1 Approach with LPV and LNAV landing minimums.	$0
Mecklenburg-Brunswick Regional	AVC	Request procedure be modified to eliminate ADF requirement. (Runway 1)	$0
Mecklenburg-Brunswick Regional	AVC	Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	$5,000

YEARS 1 & 2 Airport Name	ID	Recommended Improvement	Est. Cost
Mecklenburg-Brunswick Regional	AVC	Request procedure title be updated to RNAV (GPS) RWY 19 format.	$0
Mecklenburg-Brunswick Regional	AVC	Replace problematic localizer. (Runway 1)	$100,000
Middle Peninsula Regional	FYJ	Request addition of Approach Category D minimums to the procedure.	$0
Middle Peninsula Regional	FYJ	Request development of RNAV (GPS) RWY 10 Approach with LPV and LNAV landing minimums.	$0
Middle Peninsula Regional	FYJ	Request FAA re-evaluation of remote altimeter setting source penalty.	$0
Middle Peninsula Regional	FYJ	Request development of RNAV (GPS) RWY 28 Approach with LPV and LNAV landing minimums.	$0
Middle Peninsula Regional	FYJ	Change control sequence and/or facility directory note for MIRLs to be preset on low intensity with higher intensity activated on CTAF.	$10,000
Middle Peninsula Regional	FYJ	Request procedure be updated to separate GPS approach from ground-based approach.	$0
Middle Peninsula Regional	FYJ	Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	$5,000
Mountain Empire	MKJ	Request addition of Approach Category D minimums to the procedure. (Runway 26)	$0
Mountain Empire	MKJ	Request development of RNAV (GPS) RWY 8 Approach with LPV and LNAV landing minimums.	$0
Mountain Empire	MKJ	Request procedure be modified to eliminate ADF requirement. (Runway 26)	$0
Mountain Empire	MKJ	Update touchdown zone elevation. (Runway 26)	$0
Mountain Empire	MKJ	Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	$5,000
Mountain Empire	MKJ	Request development of RNAV (RNP) RWY 26 approach.	$0
Mountain Empire	MKJ	Install a Ground Communication Outlet (GCO) directly with Atlanta Center.	$20,000
New Kent County	W96	Request development of RNAV (GPS) RWY 28 Approach with LPV landing minimums.	$0
New Kent County	W96	Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	$5,000
New Kent County	W96	Request development of RNAV (GPS) RWY 10 Approach with LPV landing minimums.	$0
New River Valley	PSK	Request FAA re-evaluation to obtain visibility credit for existing MALSR system. (Runway 6)	$0
New River Valley	PSK	Request development of RNAV (GPS) RWY 6 Approach with LPV and LNAV landing minimums.	$0
New River Valley	PSK	Change control sequence and/or facility directory note for HIRLs to be preset on low intensity with higher intensity activated on CTAF.	$10,000
Newport News-Williamsburg Int'l	PHF	Request development of RNAV (GPS) RWY 7 Approach with LPV landing minimums.	$0
Newport News-Williamsburg Int'l	PHF	Request development of RNAV (GPS) RWY 2 Approach with LPV landing minimums.	$0

YEARS 1 & 2 Airport Name	ID	Recommended Improvement	Est. Cost
Newport News-Williamsburg Int'l	PHF	Request development of RNAV (GPS) RWY 20 Approach with LPV landing minimums.	$0
Norfolk International	ORF	Request development of RNAV (GPS) RWY 23 Approach with LPV landing minimums.	$0
Norfolk International	ORF	Field verify critical obstacle to change accuracy code from "D" to "A" or 50 feet to 3 feet. (Runway 5)	$10,000
Norfolk International	ORF	Request Runway 23 centerline lighting be added to AFD and appropriate airport diagrams.	$0
Norfolk International	ORF	Request development of RNAV (GPS) RWY 5 Approach with LPV landing minimums.	$0
Norfolk International	ORF	Request development of RNAV (GPS) RWY 14 Approach with LPV landing minimums.	$0
Norfolk International	ORF	Request development of RNAV (GPS) RWY 32 Approach with LPV landing minimums.	$0
Orange County	OMH	Request development of RNAV (GPS) RWY 8 Approach with LPV landing minimums.	$0
Orange County	OMH	Request development of RNAV (GPS) RWY 26 Approach with LPV and LNAV landing minimums.	$0
Orange County	OMH	Request FAA re-evaluate remote altimeter setting source (RASS) adjustment of 72 feet. (Runway 8)	$0
Orange County	OMH	Change control sequence and/or facility directory note for MIRLs to be preset on low intensity with higher intensity activated on CTAF.	$10,000
Orange County	OMH	Request procedure title be updated to RNAV (GPS) RWY 8 format.	$0
Orange County	OMH	Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	$5,000
Orange County	OMH	Install a Ground Communication Outlet (GCO) directly with Potomac Approach.	$20,000
Orange County	OMH	Upgrade Gordonsville VORTAC to improve signal quality.	$0
Richmond International	RIC	Field verify critical obstacle to change accuracy code from "D" to "A" or 50 feet to 3 feet. (Runway 16)	$10,000
Richmond International	RIC	Request development of RNAV (GPS) RWY 20 Approach with LPV landing minimums.	$0
Richmond International	RIC	Request development of RNAV (GPS) RWY 34 Approach with LPV landing minimums.	$0
Richmond International	RIC	Request development of RNAV (GPS) RWY 16 Approach with LPV landing minimums.	$0
Richmond International	RIC	Confirm presence of REILs and MALSR; remove REILs. (Runway 2)	$0
Richmond International	RIC	Field verify critical obstacle to change accuracy code from "D" to "A" or 50 feet to 3 feet. (Runway 2)	$10,000
Richmond International	RIC	Field verify critical obstacle to change accuracy code from "D" to "A" or 50 feet to 3 feet. (Runway 20)	$10,000
Richmond International	RIC	Field verify critical obstacle to change accuracy code from "D" to "A" or 50 feet to 3 feet. (Runway 25)	$10,000
Richmond International	RIC	Request development of RNAV (GPS) RWY 2 Approach with LPV landing minimums.	$0

YEARS 1 & 2 Airport Name	ID	Recommended Improvement	Est. Cost
Richmond International	RIC	Remove or lower close-in obstruction (light pole) below 34:1 slope. (Runway 2)	$20,000
Roanoke Regional	ROA	Request development of RNAV (RNP) RWY 6 Approach.	$0
Roanoke Regional	ROA	Request development of RNAV (RNP) RWY 33 Approach.	$0
Roanoke Regional	ROA	Request development of RNAV (RNP) RWY 24 Approach with LPV landing minimums.	$0
Roanoke Regional	ROA	Request localizer procedure be modified to include step-down fix. (Runway 33)	$0
Roanoke Regional	ROA	Field verify critical obstacle to change accuracy code from "D" to "A" or 50 feet to 3 feet. (Runway 6)	$10,000
Roanoke Regional	ROA	Field verify critical obstacle to change accuracy code from "D" to "A" or 50 feet to 3 feet for localizer approach. (Runway 33)	$10,000
Roanoke Regional	ROA	Request development of RNAV (GPS) RWY 6 Approach with LPV landing minimums.	$0
Roanoke Regional	ROA	Field verify critical obstacle to change accuracy code from "D" to "A" or 50 feet to 3 feet. (Runway 24)	$10,000
Roanoke Regional	ROA	Request development of RNAV (GPS) RWY 33 Approach with LPV landing minimums.	$0
Roanoke Regional	ROA	Request development of RNAV (GPS) RWY 24 Approach with LPV landing minimums.	$0
Roanoke Regional	ROA	Confirm presence of REILs and MALSR; remove REILs. (Runway 6)	$10,000
Shannon	EZF	Request development of RNAV (GPS) RWY 24 approach with LP landing minimums	$0
Shannon	EZF	Request development of VOR RWY 24 Approach based on BRV VORTAC.	$0
Shannon	EZF	Request development of RNAV (GPS) RWY 6 Approach with LNAV landing minimums.	$0
Shannon	EZF	Change control sequence and/or facility directory note for MIRLs to be preset on low intensity with higher intensity activated on CTAF.	$10,000
Shannon	EZF	Request deletion of Approach Category C minimums from the procedure. (Runway 24)	$0
Shannon	EZF	Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	$5,000
Shenandoah Valley Regional	SHD	Request "ADF Required" be added to line 2 of data block. (Runway 5)	$0
Shenandoah Valley Regional	SHD	Request procedure be modified to eliminate ADF requirement. (Runway 5)	$0
Shenandoah Valley Regional	SHD	Request procedure be updated to separate GPS approach from ground-based approach. (Runway 5)	$0
Shenandoah Valley Regional	SHD	Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	$5,000
Shenandoah Valley Regional	SHD	Request development of RNAV (GPS) RWY 5 Approach with LPV and LNAV landing minimums.	$0
Shenandoah Valley Regional	SHD	Request development of RNAV (RNP) RWY 5 approach.	$0

YEARS 1 & 2 Airport Name	ID	Recommended Improvement	Est. Cost
Shenandoah Valley Regional	SHD	Request development of RNAV (GPS) RWY 23 Approach with LPV landing minimums.	$0
Shenandoah Valley Regional	SHD	Request development of RNAV (RNP) RWY 23 Approach.	$0
Smith Mountain Lake	W91	Request development of RNAV (GPS) RWY 23 Approach with LNAV landing minimums.	$0
Smith Mountain Lake	W91	Request procedure be updated to separate GPS approach from ground-based approach. (Runway 23)	$0
Smith Mountain Lake	W91	Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	$5,000
Stafford Regional	RMN	Request development of RNAV (GPS) RWY 15 Approach with LPV and LNAV landing minimums.	$0
Stafford Regional	RMN	Request development of RNAV (RNP) RWY 15 Approach with LPV and LNAV landing minimums.	$0
Stafford Regional	RMN	Change control sequence and/or facility directory note for HIRLs to be preset on low intensity with higher intensity activated on CTAF.	$10,000
Stafford Regional	RMN	Request procedure be modified to eliminate ADF requirement. (Runway 33)	$0
Stafford Regional	RMN	Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	$5,000
Stafford Regional	RMN	Request development of RNAV (GPS) RWY 33 Approach with LPV and LNAV landing minimums.	$0
Stafford Regional	RMN	Request development of RNAV (RNP) RWY 33 Approach with LPV and LNAV landing minimums.	$0
Suffolk Executive	SFQ	Request addition of Approach Category D minimums to the procedure. (Runway 4)	$0
Suffolk Executive	SFQ	Request addition of Approach Category D minimums to the procedure. (Runway 7)	$0
Suffolk Executive	SFQ	Request FAA re-evaluate air traffic adjustment of 51 feet. (Runway 4)	$0
Suffolk Executive	SFQ	Change control sequence and/or facility directory note for HIRLs to be preset on low intensity with higher intensity activated on CTAF.	$10,000
Suffolk Executive	SFQ	Request development of RNAV (GPS) RWY 4 Approach with LPV landing minimums.	$0
Suffolk Executive	SFQ	Request FAA re-evaluate air traffic adjustment of 51 feet. (Runway 7)	$0
Suffolk Executive	SFQ	Request development of RNAV (GPS) RWY 25 Approach with LNAV landing minimums.	$0
Suffolk Executive	SFQ	Request development of RNAV (GPS) RWY 22 Approach with LPV and LNAV landing minimums.	$0
Suffolk Executive	SFQ	Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	$5,000
Tangier Island	TGI	Request development of RNAV (GPS) RWY 2 Approach with LPV and LNAV landing minimums.	$0
Tangier Island	TGI	Request development of RNAV (GPS) RWY 20 Approach with LNAV landing minimums.	$0

YEARS 1 & 2 Airport Name	ID	Recommended Improvement	Est. Cost
Tangier Island	TGI	Field verify critical obstacle to change accuracy code from "D" to "A" or 50 feet to 3 feet. (Runway 2)	$10,000
Tangier Island	TGI	Request procedure be updated to increase line weight of final approach course and diagram. (Runway 2)	$0
Tangier Island	TGI	Request procedure be updated to separate GPS approach from ground-based approach. (Runway 2)	$0
Tangier Island	TGI	Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	$5,000
Tangier Island	TGI	Install a Ground Communication Outlet (GCO) directly with Patuxent Approach.	$20,000
Tangier Island	TGI	Request commissioning of Wallops ASR Radar.	
Tappahannock-Essex County	XSA	Request addition of Approach Category C and D minimums to the procedure. (Runway 28)	$0
Tappahannock-Essex County	XSA	Request addition of Approach Category C and D minimums to the procedure. (Runway 10)	$0
Tappahannock-Essex County	XSA	Request re-evaluation of procedure with recent aeronautical survey information to review AAO. (Runway 28)	$0
Tappahannock-Essex County	XSA	Request re-evaluation of procedure with recent aeronautical survey information to review AAO. (Runway 10)	$0
Tappahannock-Essex County	XSA	Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	$5,000
Tappahannock-Essex County	XSA	Request development of RNAV (GPS) RWY 10 approach with LPV landing minimums.	$0
Tappahannock-Essex County	XSA	Request development of RNAV (GPS) RWY 28 approach with LPV landing minimums.	$0
Tappahannock-Essex County	XSA	Install a Ground Communication Outlet (GCO) directly with Potomac Approach.	$20,000
Tazewell County	6V3	Request development of RNAV (GPS) RWY 25 Approach with LPV landing minimums.	$0
Tazewell County	6V3	Request development of RNAV (GPS) RWY 7 Approach with LNAV and LPV landing minimums.	$0
Tazewell County	6V3	Update airport identifier to three letter format.	$0
Tazewell County	6V3	Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	$5,000
Tazewell County	6V3	Implement standard glidepath angle (3.0 degrees) with removal of obstructions. (Runway 7)	$5,000
Twin County	HLX	Request development of RNAV (GPS) RWY 1 Approach with LPV landing minimums.	$0
Twin County	HLX	Study feasibility of VOR/DME RWY 19 approach based on PSK VORTAC.	$0
Twin County	HLX	Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	$5,000
Twin County	HLX	Change runway designation from "01" to "1". (Runway 19)	$0
Virginia Highlands	VJI	Request development of RNAV (GPS) RWY 6 Approach with LPV and LNAV landing minimums.	$0

YEARS 1 & 2 Airport Name	ID	Recommended Improvement	Est. Cost
Virginia Highlands	VJI	Request development of RNAV (GPS) RWY 24 Approach with LPV and LNAV landing minimums.	$0
Virginia Highlands	VJI	Request development of RNAV (RNP) RWY 24 approach.	$0
Virginia Highlands	VJI	Request procedure be modified to eliminate ADF requirement. (Runway 24)	$0
Virginia Highlands	VJI	Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	$5,000
Virginia Tech	BCB	Request addition of Approach Category D minimums to the procedure. (Runway 12)	$0
Virginia Tech	BCB	Request development of RNAV (GPS) RWY 30 Approach with LNAV and LPV landing minimums.	$0
Virginia Tech	BCB	Confirm and remove close-in critical obstructions. (Runway 12)	$10,000
Virginia Tech	BCB	Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	$5,000
Wakefield Municipal	AKQ	Request FAA re-evaluation of remote altimeter setting source penalty. (Runway 20)	$0
Wakefield Municipal	AKQ	Request development of RNAV (GPS) RWY 2 Approach with LNAV landing minimums.	$0
Wakefield Municipal	AKQ	Request development of VOR/DME RWY 2 approach.	$0
Wakefield Municipal	AKQ	Request development of RNAV (GPS) RWY 20 Approach with LPV landing minimums.	$0
Wakefield Municipal	AKQ	Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	$5,000
Wakefield Municipal	AKQ	Install a Ground Communication Outlet (GCO) directly with Norfolk Approach.	$20,000
Warrenton-Fauquier	HWY	Request development of RNAV (GPS) RWY 14 Approach with LPV landing minimums.	$0
Warrenton-Fauquier	HWY	Request development of VOR/DME RWY 32 approach.	$0
Warrenton-Fauquier	HWY	Request FAA re-evaluation of remote altimeter setting source penalty. (Runway 14)	$0
Warrenton-Fauquier	HWY	Request development of RNAV (GPS) RWY 32 Approach with LPV and LNAV landing minimums.	$0
Warrenton-Fauquier	HWY	Change control sequence and/or facility directory note for HIRLs to be preset on low intensity with higher intensity activated on CTAF.	$10,000
Warrenton-Fauquier	HWY	Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	$5,000
William M. Tuck	W78	Request addition of Approach Category D minimums to the procedure. (Runway 1)	$0
William M. Tuck	W78	Request development of RNAV (GPS) RWY 19 Approach with LPV and LNAV landing minimums.	$0
William M. Tuck	W78	Change control sequence and/or facility directory note for MIRLs to be preset on low intensity with higher intensity activated on CTAF.	$10,000
William M. Tuck	W78	Repair REILs and eliminate AFD note "Runway 1 REILS OTS indef".	$50,000

YEARS 1 & 2 Airport Name	ID	Recommended Improvement	Est. Cost
William M. Tuck	W78	Request development of RNAV (GPS) RWY 1 Approach with LPV and LNAV landing minimums.	$0
William M. Tuck	W78	Request procedure title be updated to RNAV (GPS) RWY 1 format.	$0
William M. Tuck	W78	Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	$5,000
William M. Tuck	W78	Install a Ground Communication Outlet (GCO) directly with Washington Center.	$20,000
Williamsburg-Jamestown	JGG	Request development of RNAV (GPS) RWY 31 Approach with LP and LNAV landing minimums.	$0
Williamsburg-Jamestown	JGG	Request FAA re-evaluation of remote altimeter setting source penalty.	$0
Williamsburg-Jamestown	JGG	Request development of RNAV (GPS) RWY 13 Approach with LNAV landing minimums.	$0
Williamsburg-Jamestown	JGG	Change control sequence and/or facility directory note for MIRLs to be preset on low intensity with higher intensity activated on CTAF.	$10,000
Williamsburg-Jamestown	JGG	Request deletion of Approach Category C minimums from the procedure.	$0
Williamsburg-Jamestown	JGG	Request procedure be updated to separate GPS approach from ground-based approach.	$0
Williamsburg-Jamestown	JGG	Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	$5,000
Winchester Regional	OKV	Request development of RNAV (GPS) RWY 14 Approach with LPV landing minimums.	$0
Winchester Regional	OKV	Change control sequence and/or facility directory note for MIRLs to be preset on low intensity with higher intensity activated on CTAF.	$10,000
Winchester Regional	OKV	Request procedure be updated to separate GPS approach from ground-based approach.	$0
Winchester Regional	OKV	Install sign with Clearance Delivery Frequency and Phone Number at apron and each runway end hold position.	$5,000
Winchester Regional	OKV	Field verify critical obstacle to change accuracy code from "F" to "A" or 80 feet to 3 feet. (Runway 14)	$10,000
Winchester Regional	OKV	Request procedure title be updated to RNAV (GPS) RWY 14 format.	$0
Winchester Regional	OKV	Confirm the removal of close-in critical obstruction. (Runway 32)	$10,000
Winchester Regional	OKV	Request development of RNAV (GPS) RWY 32 Approach with LPV and LNAV landing minimums.	$0
			$1,695,000

source: Consultant Recommendation

The recommendations summarized below represent projects which are believed to be suitable for the DOAV's Facilities and Equipment Program. The Priority System has been used to sort these recommendations, which are presented below in order of priority (highest ranking first). These recommendations comprise the remainder of the proposed Six Year Plan.

Table 9-3 – Facilities and Equipment Program, Year Three

YEAR 3 Airport Name	ID	Recommended Improvement	Priority	Est. Cost
Manassas Regional	HEF	Relocate localizer to centerline to allow for publication of standard ILS minimums. (Runway 16L)	205	$100,000
Manassas Regional	HEF	Request aeronautical survey to enable development of approaches.	195	$60,000
Richmond International	RIC	Request aeronautical survey to enable development of approaches.	195	$50,000
Roanoke Regional	ROA	Request aeronautical survey to enable development of approaches.	195	$70,000
Charlottesville-Albemarle	CHO	Request aeronautical survey to enable development of approaches.	190	$50,000
Lynchburg Regional	LYH	Request aeronautical survey to enable development of approaches.	190	$30,000
Shenandoah Valley Regional	SHD	Request aeronautical survey to enable development of approaches.	190	$40,000
Hampton Roads Executive	PVG	Request aeronautical survey to enable development of approaches.	185	$50,000
Leesburg Executive	JYO	Request aeronautical survey to enable development of approaches.	185	$50,000
Manassas Regional	HEF	Install Runway Visual Range (RVR) equipment. (Runway 16L)	185	$400,000
				$900,000

source: Consultant Recommendation

Table 9-4 – Facilities and Equipment Program, Year Four

YEAR 4 Airport Name	ID	Recommended Improvement	Priority	Est. Cost
Newport News-Williamsburg Int'l	PHF	Request aeronautical survey to enable development of approaches.	185	$70,000
Norfolk International	ORF	Request aeronautical survey to enable development of approaches.	185	$50,000
Roanoke Regional	ROA	Install Runway Visual Range (RVR) equipment. (Runway 6)	185	$400,000
Charlottesville-Albemarle	CHO	Install Distance Measuring Equipment (DME). Co-locate with the localizer. (Runway 3)	180	$200,000
				$720,000

source: Consultant Recommendation

Table 9-5 – Facilities and Equipment Program, Year 5

YEAR 5 Airport Name	ID	Recommended Improvement	Priority	Est. Cost
Charlottesville-Albemarle	CHO	Install Runway Visual Range (RVR) equipment. (Runway 3)	180	$400,000
Middle Peninsula Regional	FYJ	Request aeronautical survey to enable development of approaches.	180	$50,000
Shenandoah Valley Regional	SHD	Install Runway Visual Range (RVR) equipment. (Runway 5)	180	$400,000
				$850,000

source: Consultant Recommendation

Table 9-6 – Facilities and Equipment Program, Year 6

YEAR 6 Airport Name	ID	Recommended Improvement	Priority	Est. Cost
Virginia Highlands	VJI	Request aeronautical survey to enable development of approaches.	180	$40,000
Chesapeake Regional	CPK	Request aeronautical survey to enable development of approaches.	175	$50,000
Manassas Regional	HEF	Install localizer and request development of LOC RWY 34R Approach. An offset localizer may be required to avoid R-6608 airspace.	175	$400,000
				$490,000

source: Consultant Recommendation

MID-TERM IMPROVEMENTS (10 YEAR PLAN)

The recommendations summarized below represent additional projects which are believed to be suitable for the DOAV's Facilities and Equipment Program. The Priority System has been used to sort these recommendations, which are presented below in order of priority (highest ranking first). These recommendations comprise the remainder of the proposed Ten Year Plan.

Table 9-7 – Facilities and Equipment Program, Years 7 - 10

YEARS 7 10 Airport Name	ID	Recommended Improvement	Priority	Est. Cost
Newport News-Williamsburg Int'l	PHF	Install midfield and roll-out Runway Visual Range (RVR) equipment. (Runway 7)	175	$600,000
Norfolk International	ORF	Install midfield and roll-out Runway Visual Range (RVR) equipment. (Runway 5)	175	$600,000
Roanoke Regional	ROA	Install Runway Visual Range (RVR) equipment. (Runway 33)	175	$400,000
Charlottesville-Albemarle	CHO	Install Runway Visual Range (RVR) equipment. (Runway 21)	170	$400,000
Danville Regional	DAN	Request aeronautical survey to enable development of approaches.	170	$50,000
Manassas Regional	HEF	Install MALS for Runway 34R.	170	$450,000
Middle Peninsula Regional	FYJ	Install localizer and request development of LOC RWY 10 Approach.	170	$200,000
Stafford Regional	RMN	Request aeronautical survey to enable development of approaches.	170	$50,000
				$2,750,000

source: Consultant Recommendation

LONG-TERM IMPROVEMENTS (20 YEAR PLAN)

The recommendations summarized below represent the remainder of the proposed Twenty Year Plan for the DOAV's Facility and Equipment Program. The Priority System has been used to sort these recommendations, which are presented below in order of priority (highest ranking first).

Table 9-8 – Facilities and Equipment Program, Years 11 - 20

Years 11 20 Airport Name	ID	Recommended Improvement	Priority	Est. Cost
Charlottesville-Albemarle	CHO	Install MALSR for Runway 21.	165	$1,250,000
Leesburg Executive	JYO	Upgrade nonstandard Runway 17 ODALS to MALSR	165	$850,000
Lynchburg Regional	LYH	Install MALS for Runway 22.	165	$650,000
Manassas Regional	HEF	Install Distance Measuring Equipment (DME). Co-locate with the localizer. (Runway 16L)	165	$200,000
Manassas Regional	HEF	Upgrade existing AWOS-III to include present weather, lightning and freezing rain sensor.	165	$60,000
Middle Peninsula Regional	FYJ	Install MALS for Runway 10.	165	$450,000
Norfolk International	ORF	Upgrade MALSR to ALSF-II for Runway 5.	165	$5,000,000
				$8,460,000

source: Consultant Recommendation

ADDITIONAL IMPROVEMENTS (BEYOND 20 YEAR PLANNING HORIZON)

The recommendations summarized below represent recommendations that were developed as part of the Study, suitable for the DOAV's Facilities and Equipment Program, that will likely fall beyond the 20 year planning horizon due to budget constraints. The Priority System has been used to sort these recommendations, which are presented below in order of priority (highest ranking first).

Table 9-9 – Facilities and Equipment Program, Beyond 20 Years

Beyond 20 Years Airport Name	ID	Recommended Improvement	Priority	Est. Cost
Norfolk International	ORF	Install Runway Visual Range (RVR) equipment. (Runway 23)	165	$400,000
Newport News-Williamsburg Int'l	PHF	Upgrade MALSR to ALSF-II for Runway 7.	165	$5,000,000
Newport News-Williamsburg Int'l	PHF	Install Runway Visual Range (RVR) equipment. (Runway 25)	165	$400,000
Richmond International	RIC	Install Runway Visual Range (RVR) equipment. (Runway 2)	165	$400,000
Shenandoah Valley Regional	SHD	Install MALSR for Runway 23.	165	$1,250,000
Suffolk Executive	SFQ	Request aeronautical survey to enable development of approaches.	165	$50,000
Chesterfield County	FCI	Install MALS for Runway 15.	160	$450,000
Danville Regional	DAN	Install Runway Visual Range (RVR) equipment. (Runway 2)	160	$400,000
Front Royal-Warren County	FRR	Request aeronautical survey to enable development of approaches.	160	$50,000
Hampton Roads Executive	PVG	Install MALS for Runway 28 (new runway only).	160	$400,000
Leesburg Executive	JYO	Install MALS for Runway 35.	160	$400,000
New River Valley	PSK	Request aeronautical survey to enable development of approaches.	160	$50,000
Newport News-Williamsburg Int'l	PHF	Install MALSR for Runway 25.	160	$1,250,000
Richmond International	RIC	Install MALSR for Runway 20.	160	$1,250,000
Roanoke Regional	ROA	Install centerline lights for Runway 6-24.	160	$800,000
Roanoke Regional	ROA	Install touchdown zone lights for Runway 6.	160	$800,000
Shenandoah Valley Regional	SHD	Upgrade existing AWOS-III to include freezing rain sensor.	160	$50,000
Charlottesville-Albemarle	CHO	Install centerline lights for Runway 3-21.	155	$800,000
Charlottesville-Albemarle	CHO	Install touchdown zone lights for Runway 3.	155	$800,000
Chesterfield County	FCI	Upgrade existing AWOS-III to include present weather, lightning and freezing rain sensor.	155	$60,000

Beyond 20 Years Airport Name	ID	Recommended Improvement	Priority	Est. Cost
Dinwiddie County	PTB	Install Distance Measuring Equipment (DME). Co-locate with the localizer. (Runway 5)	155	$100,000
Dinwiddie County	PTB	Upgrade existing AWOS-III to include freezing rain sensor.	155	$50,000
Farmville Regional	FVX	Install localizer and request development of LOC RWY 3 approach.	155	$200,000
Hampton Roads Executive	PVG	Install Distance Measuring Equipment (DME) in conjunction with localizer. (Runway 10)	155	$100,000
Hampton Roads Executive	PVG	Install MALSR for Runway 10 (new runway only).	155	$800,000
Hampton Roads Executive	PVG	Upgrade existing AWOS-III to include present weather, lightning and freezing rain sensor.	155	$60,000
Leesburg Executive	JYO	Upgrade existing AWOS-III to include freezing rain sensor.	155	$50,000
Luray Caverns	W45	Install AWOS-III.	155	$150,000
Newport News-Williamsburg Int'l	PHF	Request development of ILS RWY 7 (CAT II). Requires upgrade of localizer and glide slope equipment.	155	$800,000
Norfolk International	ORF	Request development of ILS RWY 5 (CAT II) and ILS RWY 5 (CAT III) approaches.	155	$800,000
Orange County	OMH	Request aeronautical survey to enable development of approaches.	155	$50,000
Richmond International	RIC	Install 4-box PAPI for Runway 34.	155	$200,000
Virginia Tech	BCB	Request aeronautical survey to enable development of approaches.	155	$40,000
Blackstone Municipal	BKT	Request aeronautical survey to enable development of approaches.	150	$50,000
Charlottesville-Albemarle	CHO	Install 4-box PAPI for Runway 3.	150	$200,000
Charlottesville-Albemarle	CHO	Request development of ILS RWY 21 and LOC RWY 21.	150	$2,000,000
Chesapeake Regional	CPK	Install MALS for Runway 23.	150	$450,000
Lee County	0VG	Request aeronautical survey to enable development of approaches.	150	$40,000
Louisa County	LKU	Request aeronautical survey to enable development of approaches.	150	$50,000
Luray Caverns	W45	Request aeronautical survey to enable development of approaches.	150	$50,000
Middle Peninsula Regional	FYJ	Upgrade existing AWOS-III to include lightning and freezing rain sensor.	150	$60,000
Newport News-Williamsburg Int'l	PHF	Install centerline lights for Runway 7-25.	150	$800,000
Newport News-Williamsburg Int'l	PHF	Install MALS for Runway 20.	150	$650,000
Newport News-Williamsburg Int'l	PHF	Install touchdown zone lights for Runway 7.	150	$800,000
Richmond International	RIC	Install touchdown zone lights for Runway 16.	150	$800,000

Beyond 20 Years Airport Name	ID	Recommended Improvement	Priority	Est. Cost
Roanoke Regional	ROA	Install centerline lights for Runway 15-33.	150	$800,000
Roanoke Regional	ROA	Install touchdown zone lights for Runway 33.	150	$800,000
Shenandoah Valley Regional	SHD	Install a Remote Transmitter / Receiver (RTR) directly with Potomac Approach.	150	$40,000
Shenandoah Valley Regional	SHD	Install Distance Measuring Equipment (DME). Co-locate with the localizer. (Runway 5)	150	$200,000
Stafford Regional	RMN	Install Marker Beacon at WALOX intersection. (Runway 33)	150	$50,000
Suffolk Executive	SFQ	Install MALS for Runway 4.	150	$450,000
Tangier Island	TGI	Install AWOS-III.	150	$150,000
Virginia Highlands	VJI	Upgrade existing AWOS-III to include present weather, lightning and freezing rain sensor.	150	$60,000
Winchester Regional	OKV	Upgrade existing AWOS-III to include freezing rain sensor.	150	$50,000
Accomack County	MFV	Install MALS for Runway 3.	145	$450,000
Chesapeake Regional	CPK	Upgrade existing AWOS-III to include freezing rain sensor.	145	$50,000
Dinwiddie County	PTB	Upgrade existing Ground Communication Outlet (GCO) to a Remote Transmitter / Receiver (RTR) directly with Potomac Approach.	145	$40,000
Emporia-Greensville Regional	EMV	Request aeronautical survey to enable development of approaches.	145	$50,000
Farmville Regional	FVX	Upgrade existing AWOS-III to include lightning and freezing rain sensor.	145	$60,000
Franklin Municipal	FKN	Request aeronautical survey to enable development of approaches.	145	$50,000
Front Royal-Warren County	FRR	Install AWOS-A.	145	$25,000
Hampton Roads Executive	PVG	Install 4-box PAPI for Runway 10.	145	$70,000
Hampton Roads Executive	PVG	Install a Remote Transmitter / Receiver (RTR) directly with Norfolk Approach.	145	$40,000
Hampton Roads Executive	PVG	Install REILs for Runway 10.	145	$50,000
Manassas Regional	HEF	Install an Outer Marker. (Runway 16L)	145	$50,000
Newport News-Williamsburg Int'l	PHF	Install 4-box PAPI for Runway 7.	145	$200,000
Richmond International	RIC	Install Distance Measuring Equipment (DME). Co-locate with I-BNE localizer. (Runway 34)	145	$200,000
Roanoke Regional	ROA	Expand lateral operational coverage of Runway 6 approach lighting system. Upgrade MALSR (10 deg. coverage) to ALSF-II (21 deg. coverage).	145	$5,000,000
Roanoke Regional	ROA	Install Distance Measuring Equipment (DME). Co-locate with Woodrum VOR (ODR).	145	$200,000
Roanoke Regional	ROA	Upgrade Runway 6 VASI to a 4-box PAPI.	145	$200,000
Stafford Regional	RMN	Install MALS for Runway 15.	145	$450,000

Beyond 20 Years Airport Name	ID	Recommended Improvement	Priority	Est. Cost
Suffolk Executive	SFQ	Relocate localizer to allow for approach on centerline. (Runway 4)	145	$100,000
Tangier Island	TGI	Request aeronautical survey to enable development of approaches.	145	$50,000
Charlottesville-Albemarle	CHO	Install an Outer Marker. (Runway 3)	140	$50,000
Culpeper Regional	CJR	Upgrade existing AWOS-III to include freezing rain sensor.	140	$50,000
Danville Regional	DAN	Upgrade existing AWOS-III to include lightning and freezing rain sensor.	140	$60,000
Ingalls Field	HSP	Install Runway Visual Range (RVR) equipment. (Runway 25)	140	$400,000
Lynchburg Regional	LYH	Install Distance Measuring Equipment (DME). Co-locate with the localizer. (Runway 4)	140	$200,000
Middle Peninsula Regional	FYJ	Install 4-box PAPI for Runway 10.	140	$70,000
Middle Peninsula Regional	FYJ	Install a Remote Transmitter / Receiver (RTR) directly with Potomac Approach.	140	$40,000
Middle Peninsula Regional	FYJ	Install Distance Measuring Equipment (DME) in conjunction with localizer. (Runway 10)	140	$100,000
Middle Peninsula Regional	FYJ	Install REILs for Runway 10.	140	$50,000
Newport News-Williamsburg Int'l	PHF	Install touchdown zone lights for Runway 25.	140	$800,000
Norfolk International	ORF	Install touchdown zone lights for Runway 23.	140	$800,000
Stafford Regional	RMN	Upgrade existing AWOS-III to include freezing rain sensor.	140	$50,000
Twin County	HLX	Request aeronautical survey to enable development of approaches.	140	$50,000
Blackstone Municipal	BKT	Install AWOS-A.	135	$25,000
Blue Ridge	MTV	Upgrade existing AWOS-III to include lightning and freezing rain sensor.	135	$60,000
Chesapeake Regional	CPK	Upgrade existing Ground Communication Outlet (GCO) to a Remote Transmitter / Receiver (RTR) directly with Norfolk Approach.	135	$40,000
Dinwiddie County	PTB	Upgrade Runway 5 ODALS to MALS.	135	$400,000
Farmville Regional	FVX	Install REILs for Runway 21.	135	$50,000
Hampton Roads Executive	PVG	Install 4-box PAPI for Runway 28.	135	$70,000
Hampton Roads Executive	PVG	Install REILs for Runway 28.	135	$50,000
Newport News-Williamsburg Int'l	PHF	Install localizer and request development of LOC RWY 20 Approach.	135	$400,000
Richmond International	RIC	Install 4-box PAPI for Runway 25.	135	$200,000
Richmond International	RIC	Install 4-box PAPI for Runway 7.	135	$200,000
Richmond International	RIC	Upgrade Runway 16 VASI to a 4-box PAPI.	135	$200,000

Beyond 20 Years Airport Name	ID	Recommended Improvement	Priority	Est. Cost
Richmond International	RIC	Install Distance Measuring Equipment (DME). Co-locate with I-BNE localizer. (Runway 16)	135	$200,000
Roanoke Regional	ROA	Install 4-box PAPI for Runway 24. Shield, as required, for mountainous terrain in approach.	135	$200,000
Roanoke Regional	ROA	Install Distance Measuring Equipment (DME). Co-locate with I-ROA localizer. (Runway 33)	135	$200,000
Stafford Regional	RMN	Upgrade Runway 33 MALS to MALSR.	135	$900,000
Suffolk Executive	SFQ	Upgrade existing AWOS-III to include freezing rain sensor.	135	$50,000
Virginia Tech	BCB	Upgrade Runway 12 ODALS to MALS.	135	$400,000
Accomack County	MFV	Upgrade existing AWOS-III to include freezing rain sensor.	130	$50,000
Charlottesville-Albemarle	CHO	Upgrade Runway 21 VASI to a 4-box PAPI.	130	$200,000
Culpeper Regional	CJR	Install Distance Measuring Equipment (DME). Co-locate with the localizer. (Runway 4)	130	$100,000
Culpeper Regional	CJR	Upgrade existing Ground Communication Outlet (GCO) to a Remote Transmitter / Receiver (RTR) directly with Potomac Approach.	130	$40,000
Danville Regional	DAN	Install Distance Measuring Equipment (DME). Co-locate with Danville VOR (DAN).	130	$200,000
Lee County	0VG	Install Distance Measuring Equipment (DME) in conjunction with localizer. (Runway 25)	130	$100,000
Lee County	0VG	Install localizer and request development of LOC RWY 25 approach.	130	$200,000
Lynchburg Regional	LYH	Upgrade Runway 22 VASI to a 4-box PAPI.	130	$200,000
Mecklenburg-Brunswick Regional	AVC	Request aeronautical survey to enable development of approaches.	130	$50,000
Middle Peninsula Regional	FYJ	Install 4-box PAPI for Runway 28.	130	$70,000
Middle Peninsula Regional	FYJ	Install REILs for Runway 28.	130	$50,000
New River Valley	PSK	Upgrade existing AWOS-III to include freezing rain sensor.	130	$50,000
Stafford Regional	RMN	Upgrade existing Ground Communication Outlet (GCO) to a Remote Transmitter / Receiver (RTR) directly with Potomac Approach.	130	$40,000
Virginia Highlands	VJI	Install 4-box PAPI for Runway 6.	130	$70,000
Virginia Highlands	VJI	Install REILs for Runway 6.	130	$50,000
Virginia Highlands	VJI	Upgrade Runway 24 ODALS to MALS.	130	$400,000
Virginia Highlands	VJI	Upgrade Runway 24 PAPI from a 2 box to a 4 box unit.	130	$20,000
Winchester Regional	OKV	Upgrade Runway 32 PAPI from a 2 box to a 4 box unit.	130	$20,000
Culpeper Regional	CJR	Install MALSR or MALS for Runway 4.	125	$850,000
Farmville Regional	FVX	Install REILs for Runway 3.	125	$50,000

Beyond 20 Years Airport Name	ID	Recommended Improvement	Priority	Est. Cost
Farmville Regional	FVX	Upgrade Runway 21 PAPI from a 2 box to a 4 box unit.	125	$20,000
Hampton Roads Executive	PVG	Install 4-box PAPI for Runway 2.	125	$70,000
Hampton Roads Executive	PVG	Install 4-box PAPI for Runway 20.	125	$70,000
Hampton Roads Executive	PVG	Install REILs for Runway 2.	125	$50,000
Hampton Roads Executive	PVG	Install REILs for Runway 20.	125	$50,000
Newport News-Williamsburg Int'l	PHF	Install REILs for Runway 2.	125	$100,000
Orange County	OMH	Upgrade existing AWOS-III to include present weather, lightning and freezing rain sensor.	125	$60,000
Richmond International	RIC	Install Distance Measuring Equipment (DME). Co-locate with I-EZD localizer. (Runway 2)	125	$200,000
Richmond International	RIC	Upgrade Runway 2 VASI to a 4-box PAPI.	125	$200,000
Richmond International	RIC	Upgrade Runway 20 VASI to a 4-box PAPI.	125	$200,000
Suffolk Executive	SFQ	Upgrade existing Ground Communication Outlet (GCO) to a Remote Transmitter / Receiver (RTR) directly with Norfolk Approach.	125	$40,000
Virginia Tech	BCB	Upgrade existing AWOS-III to include freezing rain sensor.	125	$50,000
Accomack County	MFV	Install Distance Measuring Equipment (DME). Co-locate with the localizer. (Runway 3)	120	$100,000
Accomack County	MFV	Upgrade existing Ground Communication Outlet (GCO) to a Remote Transmitter / Receiver (RTR) directly with Norfolk Approach.	120	$40,000
Brookneal-Campbell County	0V4	Install AWOS-A.	120	$25,000
Culpeper Regional	CJR	Install an Outer Marker. (Runway 4)	120	$50,000
Dinwiddie County	PTB	Replace Medium Intensity Runway Lights (MIRLs) with High Intensity Runway Lights (HIRLs). (Runway 5)	120	$300,000
Front Royal-Warren County	FRR	Install 4-box PAPI for Runway 9.	120	$70,000
Front Royal-Warren County	FRR	Install REILs for Runway 9.	120	$50,000
Hampton Roads Executive	PVG	Replace Medium Intensity Runway Lights (MIRLs) with High Intensity Runway Lights (HIRLs). (Runway 10)	120	$300,000
Ingalls Field	HSP	Upgrade existing AWOS-III to include present weather, lightning and freezing rain sensor.	120	$60,000
Louisa County	LKU	Upgrade existing AWOS-III to include lightning and freezing rain sensor.	120	$60,000
Marks Municipal	W63	Install AWOS-A.	120	$25,000

Beyond 20 Years Airport Name	ID	Recommended Improvement	Priority	Est. Cost
Mecklenburg-Brunswick Regional	AVC	Upgrade existing AWOS-III to include freezing rain sensor.	120	$50,000
New River Valley	PSK	Install 4-box PAPI for Runway 6.	120	$70,000
Tappahannock-Essex County	XSA	Install Distance Measuring Equipment (DME) in conjunction with localizer. (Runway 28)	120	$100,000
Tappahannock-Essex County	XSA	Install localizer and request development of LOC RWY 28 approach.	120	$200,000
Winchester Regional	OKV	Upgrade Runway 14 PAPI from a 2 box to a 4 box unit.	120	$20,000
Blue Ridge	MTV	Upgrade Runway 30 ODALS to MALS.	115	$400,000
Brookneal-Campbell County	0V4	Request aeronautical survey to enable development of approaches.	115	$50,000
Emporia-Greensville Regional	EMV	Upgrade existing AWOS-III to include freezing rain sensor.	115	$50,000
Farmville Regional	FVX	Upgrade Runway 3 PAPI from a 2 box to a 4 box unit.	115	$20,000
Franklin Municipal	FKN	Upgrade existing AWOS-III to include present weather, lightning and freezing rain sensor.	115	$60,000
Middle Peninsula Regional	FYJ	Replace Medium Intensity Runway Lights (MIRLs) with High Intensity Runway Lights (HIRLs). (Runway 10)	115	$300,000
Suffolk Executive	SFQ	Install Distance Measuring Equipment (DME). Co-locate with the localizer. (Runway 4)	115	$100,000
Accomack County	MFV	Upgrade Runway 3 PAPI from a 2 box to a 4 box unit.	110	$20,000
Blackstone Municipal	BKT	Install 4-box PAPI for Runway 4.	110	$70,000
Blackstone Municipal	BKT	Install REILs for Runway 4.	110	$50,000
Front Royal-Warren County	FRR	Install 4-box PAPI for Runway 27.	110	$70,000
Front Royal-Warren County	FRR	Install REILs for Runway 27.	110	$50,000
Ingalls Field	HSP	Install Distance Measuring Equipment (DME). Co-locate with the localizer. (Runway 25)	110	$200,000
Louisa County	LKU	Install Distance Measuring Equipment (DME). Co-locate with the localizer. (Runway 27)	110	$100,000
Luray Caverns	W45	Install 4-box PAPI for Runway 22.	110	$70,000
Luray Caverns	W45	Install REILs for Runway 22.	110	$50,000
New River Valley	PSK	Install Distance Measuring Equipment (DME). Co-locate with the localizer. (Runway 6)	110	$200,000
Roanoke Regional	ROA	Install touchdown zone lights for Runway 24.	110	$800,000
Tangier Island	TGI	Install Medium Intensity Runway Lights (MIRLs).	110	$125,000
Tangier Island	TGI	Install REILs for Runway 2.	105	$50,000
Twin County	HLX	Upgrade existing AWOS-III to include present weather, lightning and freezing rain sensor.	110	$60,000
Franklin Municipal	FKN	Install REILs for Runway 27.	105	$50,000

Beyond 20 Years Airport Name	ID	Recommended Improvement	Priority	Est. Cost
Orange County	OMH	Upgrade Runway 8 PAPI from a 2 box to a 4 box unit.	105	$20,000
Tangier Island	TGI	Install 4-box PAPI for Runway 2.	105	$70,000
Winchester Regional	OKV	Replace Medium Intensity Runway Lights (MIRLs) with High Intensity Runway Lights (HIRLs). (Runway 14)	105	$300,000
Accomack County	MFV	Upgrade Runway 21 PAPI from a 2 box to a 4 box unit.	100	$20,000
Blackstone Municipal	BKT	Install 4-box PAPI for Runway 22.	100	$70,000
Blackstone Municipal	BKT	Install REILs for Runway 22.	100	$50,000
Ingalls Field	HSP	Install REILs for Runway 7.	100	$50,000
Louisa County	LKU	Upgrade Runway 27 PAPI from a 2 box to a 4 box unit.	100	$20,000
Luray Caverns	W45	Install 4-box PAPI for Runway 4.	100	$70,000
Luray Caverns	W45	Install REILs for Runway 4.	100	$50,000
Mecklenburg-Brunswick Regional	AVC	Install Distance Measuring Equipment (DME). Co-locate with the localizer. (Runway 1)	100	$100,000
Mecklenburg-Brunswick Regional	AVC	Upgrade Runway 1 PAPI from a 2 box to a 4 box unit.	100	$20,000
Accomack County	MFV	Replace Medium Intensity Runway Lights (MIRLs) with High Intensity Runway Lights (HIRLs). (Runway 3)	95	$300,000
Brookneal-Campbell County	0V4	Install 4-box PAPI for Runway 24.	95	$70,000
Brookneal-Campbell County	0V4	Install REILs for Runway 24.	95	$50,000
Emporia-Greensville Regional	EMV	Install Distance Measuring Equipment (DME). Co-locate with the localizer. (Runway 33)	95	$100,000
Franklin Municipal	FKN	Install REILs for Runway 9.	95	$50,000
Marks Municipal	W63	Install 4-box PAPI for Runway 4.	95	$70,000
Marks Municipal	W63	Install REILs for Runway 4.	95	$50,000
Orange County	OMH	Upgrade Runway 26 PAPI from a 2 box to a 4 box unit.	95	$20,000
Tangier Island	TGI	Install 4-box PAPI for Runway 20.	95	$70,000
Tangier Island	TGI	Install REILs for Runway 20.	95	$50,000
Virginia Tech	BCB	Upgrade Runway 30 PAPI from a 2 box to a 4 box unit.	95	$20,000
Louisa County	LKU	Upgrade Runway 9 PAPI from a 2 box to a 4 box unit.	90	$20,000
Mecklenburg-Brunswick Regional	AVC	Upgrade Runway 19 PAPI from a 2 box to a 4 box unit.	90	$20,000
Brookneal-Campbell County	0V4	Install 4-box PAPI for Runway 6.	85	$70,000
Brookneal-Campbell County	0V4	Install REILs for Runway 6.	85	$50,000

Beyond 20 Years Airport Name	ID	Recommended Improvement	Priority	Est. Cost
Marks Municipal	W63	Install 4-box PAPI for Runway 22.	85	$70,000
Marks Municipal	W63	Install REILs for Runway 22.	85	$50,000
Warrenton-Fauquier	HWY	Request aeronautical survey to enable development of approaches.	-15	$50,000
Hanover County Municipal	OFP	Install MALSR for Runway 16.	-30	$1,050,000
Warrenton-Fauquier	HWY	Install MALSR for Runway 14.	-30	$1,100,000
William M. Tuck	W78	Request aeronautical survey to enable development of approaches.	-35	$50,000
Hanover County Municipal	OFP	Install MALS for Runway 34.	-40	$400,000
Warrenton-Fauquier	HWY	Install MALS for Runway 32.	-40	$450,000
Williamsburg-Jamestown	JGG	Request aeronautical survey to enable development of approaches.	-40	$50,000
Hanover County Municipal	OFP	Install glide slope to complete ILS RWY 16.	-45	$800,000
Hanover County Municipal	OFP	Upgrade existing AWOS-III to include lightning and freezing rain sensor.	-45	$60,000
Tazewell County	6V3	Request aeronautical survey to enable development of approaches.	-45	$50,000
William M. Tuck	W78	Install AWOS-III.	-50	$150,000
Lonesome Pine	LNP	Install MALSR for Runway 24.	-55	$1,300,000
Mountain Empire	MKJ	Request aeronautical survey to enable development of approaches.	-55	$50,000
Mountain Empire	MKJ	Upgrade existing AWOS-III to include present weather, lightning and freezing rain sensor.	-55	$60,000
Tazewell County	6V3	Install Distance Measuring Equipment (DME) in conjunction with localizer. (Runway 25)	-55	$100,000
Warrenton-Fauquier	HWY	Upgrade existing Ground Communication Outlet (GCO) to a Remote Transmitter / Receiver (RTR) directly with Potomac Approach.	-55	$40,000
Bridgewater Air Park	VBW	Request aeronautical survey to enable development of approaches.	-65	$50,000
Hanover County Municipal	OFP	Install 4-box PAPI for Runway 34.	-65	$70,000
Mountain Empire	MKJ	Install Distance Measuring Equipment (DME). Co-locate with the localizer. (Runway 26)	-65	$100,000
William M. Tuck	W78	Install localizer and request development of LOC RWY 1 approach.	-65	$200,000
Lonesome Pine	LNP	Upgrade existing AWOS-III to include present weather, lightning and freezing rain sensor.	-70	$60,000
New Kent County	W96	Install AWOS-A.	-70	$25,000
Williamsburg-Jamestown	JGG	Upgrade existing AWOS-III to include present weather, lightning and freezing rain sensor.	-70	$60,000
Grundy Municipal	GDY	Install AWOS-A.	-75	$25,000

Beyond 20 Years Airport Name	ID	Recommended Improvement	Priority	Est. Cost
Hummel Field	W75	Install AWOS-A.	-75	$25,000
Mountain Empire	MKJ	Install an Outer Marker. (Runway 26)	-75	$50,000
Mountain Empire	MKJ	Upgrade Runway 26 PAPI from a 2 box to a 4 box unit.	-75	$20,000
New Kent County	W96	Request aeronautical survey to enable development of approaches.	-75	$50,000
Tazewell County	6V3	Upgrade existing AWOS-III to include present weather, lightning and freezing rain sensor.	-75	$60,000
Wakefield Municipal	AKQ	Request aeronautical survey to enable development of approaches.	-75	$50,000
Bridgewater Air Park	VBW	Install AWOS-A.	-80	$25,000
Hanover County Municipal	OFP	Replace Medium Intensity Runway Lights (MIRLs) with High Intensity Runway Lights (HIRLs). (Runway 16)	-80	$300,000
Williamsburg-Jamestown	JGG	Install 4-box PAPI for Runway 31.	-80	$70,000
Mountain Empire	MKJ	Upgrade Runway 8 PAPI from a 2 box to a 4 box unit.	-85	$20,000
Shannon	EZF	Request aeronautical survey to enable development of approaches.	-85	$50,000
William M. Tuck	W78	Upgrade Runway 1 PAPI from a 2 box to a 4 box unit.	-85	$20,000
Lawrenceville-Brunswick	LVL	Install AWOS-A.	-90	$25,000
Lonesome Pine	LNP	Upgrade Runway 24 PAPI from a 2 box to a 4 box unit.	-90	$20,000
Williamsburg-Jamestown	JGG	Install 4-box PAPI for Runway 13.	-90	$70,000
Wakefield Municipal	AKQ	Install 4-box PAPI for Runway 20.	-95	$70,000
Wakefield Municipal	AKQ	Install REILs for Runway 20.	-95	$50,000
William M. Tuck	W78	Upgrade Runway 19 PAPI from a 2 box to a 4 box unit.	-95	$20,000
Hummel Field	W75	Install 4-box PAPI for Runway 1.	-100	$70,000
Lonesome Pine	LNP	Upgrade Runway 6 PAPI from a 2 box to a 4 box unit.	-100	$20,000
Bridgewater Air Park	VBW	Install 4-box PAPI for Runway 15.	-105	$70,000
Bridgewater Air Park	VBW	Install REILs for Runway 15.	-105	$50,000
Smith Mountain Lake	W91	Request aeronautical survey to enable development of approaches.	-105	$40,000
Wakefield Municipal	AKQ	Install 4-box PAPI for Runway 2.	-105	$70,000
Wakefield Municipal	AKQ	Install REILs for Runway 2.	-105	$50,000
Hummel Field	W75	Install 4-box PAPI for Runway 19.	-110	$70,000
Smith Mountain Lake	W91	Install AWOS-A.	-110	$25,000
Bridgewater Air Park	VBW	Install 4-box PAPI for Runway 33.	-115	$70,000

Beyond 20 Years Airport Name	ID	Recommended Improvement	Priority	Est. Cost
Bridgewater Air Park	VBW	Install REILs for Runway 33.	-115	$50,000
Lonesome Pine	LNP	Replace Medium Intensity Runway Lights (MIRLs) with High Intensity Runway Lights (HIRLs). (Runway 6)	-115	$300,000
Shannon	EZF	Upgrade existing AWOS-III to include present weather, lightning and freezing rain sensor.	-115	$60,000
Williamsburg-Jamestown	JGG	Upgrade non-standard MIRLs to standard system. (Runway 13)	-115	$150,000
Chase City Municipal	CXE	Install AWOS-A.	-120	$25,000
Shannon	EZF	Install 4-box PAPI for Runway 24.	-125	$70,000
Shannon	EZF	Install REILs for Runway 24.	-125	$50,000
Shannon	EZF	Install 4-box PAPI for Runway 6.	-135	$70,000
Shannon	EZF	Install REILs for Runway 6.	-135	$50,000
Chase City Municipal	CXE	Install 4-box PAPI for Runway 36.	-145	$70,000
Chase City Municipal	CXE	Install REILs for Runway 36.	-145	$50,000
Smith Mountain Lake	W91	Install 4-box PAPI for Runway 23.	-145	$70,000
Smith Mountain Lake	W91	Install REILs for Runway 23.	-145	$50,000
Chase City Municipal	CXE	Install 4-box PAPI for Runway 18.	-155	$70,000
Chase City Municipal	CXE	Install REILs for Runway 18.	-155	$50,000
Smith Mountain Lake	W91	Install 4-box PAPI for Runway 5.	-155	$70,000
Smith Mountain Lake	W91	Install REILs for Runway 5.	-155	$50,000
Smith Mountain Lake	W91	Install Medium Intensity Runway Lights (MIRLs).	-170	$125,000
				$60,375,000

source: Consultant Recommendation

CONTINGENT RECOMMENDATIONS

The recommendations summarized in the following table are those which can best be accomplished once another improvement has been completed. These recommendations are presented in order by airport name.

Table 9-10 – Contingent Improvements

Airport Name	ID	Recommended Improvement	Est. Cost
Accomack County	MFV	Upon installation of approach lighting system and subsequent acceptance of visibility credit, different design standards apply (less than 1 mile). (Runway 3)	$1,000,000
Charlottesville-Albemarle	CHO	Upon installation of runway visual range equipment, request procedure be updated to 2400 RVR. Upon installation of centerline and touchdown zone lighting, request procedure be updated to 1800 RVR. (Runway 3)	$0
Charlottesville-Albemarle	CHO	Upon installation of approach lighting system, request procedure be updated to 1/2 statute mile visibility or 2400 RVR with installation of RVR. (Runway 21)	$600,000
Chesapeake Regional	CPK	Upon installation of approach lighting system, request procedure(s) be updated to ¾ statute mile visibility. (Runway 23)	$100,000
Chesterfield County	FCI	Upon installation of approach lighting system and subsequent acceptance of visibility credit, different design standards apply (less than 1 mile). (Runway 15)	$0
Culpeper Regional	CJR	Upon installation of approach lighting system and subsequent acceptance of visibility credit, different design standards apply (less than 1 mile). (Runway 4)	$2,100,000
Farmville Regional	FVX	Cancel NDB procedure when RNAV (GPS) RWY 3 and LOC RWY 3 procedures are published.	$0
Hampton Roads Executive	PVG	Cancel procedure when ILS (or LOC) RWY 10 procedure is published.	$0
Hampton Roads Executive	PVG	Upon installation of approach lighting system and subsequent acceptance of visibility credit, different design standards apply (less than 1 mile). (Runway 28)	$600,000
Hanover County Municipal	OFP	Upon installation of approach lighting system and subsequent acceptance of visibility credit, different design standards apply (1sm to ¾ sm). (Runway 16)	$11,000,000
Hanover County Municipal	OFP	Upon installation of approach lighting system and subsequent acceptance of visibility credit, different design standards apply (¾ sm to ½ sm). (Runway 16)	$9,000,000
Hanover County Municipal	OFP	Upon installation of approach lighting system and subsequent acceptance of visibility credit, different design standards apply (less than 1 mile). (Runway 34)	$1,400,000
Ingalls Field	HSP	Upon installation of runway visual range equipment, request procedure be updated to 4000 RVR. (Runway 25)	$360,000
Leesburg Executive	JYO	Upon installation of approach lighting system and subsequent acceptance of visibility credit, different design standards apply (1 sm to ¾ sm). (Runway 17)	$5,500,000

Airport Name	ID	Recommended Improvement	Est. Cost
Leesburg Executive	JYO	Upon installation of approach lighting system and subsequent acceptance of visibility credit, different design standards apply (¾ sm to ½ sm). (Runway 17)	$25,500,000
Leesburg Executive	JYO	Upon installation of approach lighting system and subsequent acceptance of visibility credit, different design standards apply (less than 1 mile). (Runway 35)	$6,500,000
Lonesome Pine	LNP	Upon installation of the glide slope, the visibility minimum is reduced from 1 statute mile to 1/2 statute mile and different airport design standards apply. (Runway 24)	$1,842,000
Lynchburg Regional	LYH	Upon installation of approach lighting system and subsequent acceptance of visibility credit, different design standards apply (less than 1 mile). (Runway 22)	$900,000
Manassas Regional	HEF	Upon installation of approach lighting system and subsequent acceptance of visibility credit, different design standards apply (less than 1 mile). (Runway 34R)	$400,000
Middle Peninsula Regional	FYJ	Upon installation of approach lighting system and subsequent acceptance of visibility credit, different design standards apply (less than 1 mile). (Runway 10)	$700,000
New Kent County	W96	Request FAA evaluation of canceling VOR-A approach and replacing with VOR RWY 28 approach based on RIC VORTAC.	$0
New River Valley	PSK	Cancel GPS overlay procedure when RNAV (GPS) RWY 6 procedure is commissioned.	$0
New River Valley	PSK	Upon acceptance of visibility credit, different design standards apply (less than 1 mile). (Runway 6)	$2,800,000
Newport News-Williamsburg Int'l	PHF	Cancel NDB procedure. (Runway 2)	$0
Newport News-Williamsburg Int'l	PHF	Cancel NDB procedure. (Runway 20)	$0
Newport News-Williamsburg Int'l	PHF	Upon installation of approach lighting system and subsequent acceptance of visibility credit, different design standards apply (less than 1 mile). (Runway 20)	$4,000,000
Newport News-Williamsburg Int'l	PHF	Upon installation of the ALSF-2 approach lighting system, different design standards apply. (Runway 7)	$1,000,000
Newport News-Williamsburg Int'l	PHF	Upon installation of approach lighting system and subsequent acceptance of visibility credit, different design standards apply. (Runway 25)	$500,000
Norfolk International	ORF	Upon installation of approach lighting system and subsequent acceptance of visibility credit, different design standards apply (less than 1 mile). (Runway 5)	$1,000,000
Orange County	OMH	Cancel GPS overlay procedure when RNAV (GPS) RWY 26 procedure is published.	$0
Orange County	OMH	Implement standard glidepath angle (3.0 degrees) with removal of obstructions. (Runway 8)	$0
Orange County	OMH	Implement standard glidepath angle (3.0 degrees) with removal of obstructions. (Runway 26)	$0
Richmond International	RIC	Upon installation of approach lighting system and subsequent acceptance of visibility credit, different design standards apply (less than 1 mile). (Runway 20)	$500,000

Airport Name	ID	Recommended Improvement	Est. Cost
Richmond International	RIC	Upon installation of touchdown zone lights, request visibility minimum be lowered from 2400 RVR to 1800 RVR. (Runway 16)	$0
Richmond International	RIC	Upon installation of runway visual range equipment, request procedure be updated to 2400 RVR. (Runway 2)	$0
Roanoke Regional	ROA	Upon installation of approach lighting system, touchdown zone lighting and runway visual range, visibility minimums as low as 2400 RVR can be requested. (Runway 6)	$2,250,000
Roanoke Regional	ROA	Upon installation of runway visual range equipment and touchdown zone lighting, visibility minimums as low as 2400 RVR can be requested. (Runway 33)	$0
Shannon	EZF	Cancel NDB procedure when VOR RWY 24 procedure is published.	$0
Shenandoah Valley Regional	SHD	Upon installation of runway visual range equipment, request procedure be updated to 2400 RVR. (Runway 5)	$0
Shenandoah Valley Regional	SHD	Upon installation of approach lighting system, request procedure be updated to 1/2 statute mile visibility. (Runway 23)	$500,000
Stafford County	RMN	Upon installation of approach lighting system and subsequent acceptance of visibility credit, different design standards apply (less than 1 mile). (Runway 15)	$3,000,000
Stafford County	RMN	Upon installation of approach lighting system, lower visibility minimums apply. (Runway 33)	$1,650,000
Suffolk Executive	SFQ	Upon installation of approach lighting system and subsequent acceptance of visibility credit, different design standards apply (less than 1 mile). (Runway 4)	$2,120,000
Virginia Tech	BCB	When site conditions permit, obtain visibility credit for the approach lighting system. (Runway 12)	$0
Wakefield Municipal	AKQ	Cancel procedure when VOR/DME RWY 2 procedure is published. (Runway 20)	$0
Warrenton-Fauquier	HWY	Upon installation of approach lighting system and subsequent acceptance of visibility credit, different design standards apply (less than 1 mile). (Runway 14)	$1,900,000
Warrenton-Fauquier	HWY	Upon installation of approach lighting system and subsequent acceptance of visibility credit, different design standards apply (less than 1 mile). (Runway 32)	$200,000
William M. Tuck	W78	Cancel VOR or GPS-A procedure when LOC RWY 1 is published.	$0
			$88,922,000

source: Consultant Recommendation

TECHNOLOGY-DEPENDENT RECOMMENDATIONS

The recommendations summarized in the following table are those which cannot be completed until the technology has advanced sufficiently. These recommendations are presented in order by airport name.

Table 9-11 – Technology-Dependent Recommendations

Airport Name	ID	Recommended Improvement	Est. Cost
Accomack County	MFV	Provide LAAS coverage to augment existing global positioning system.	
Accomack County	MFV	Provide ADS-B coverage while on the ground.	$100,000
Blackstone Municipal	BKT	Provide ADS-B coverage at 1000 AGL or lower.	
Blue Ridge	MTV	Provide LAAS coverage to augment existing global positioning system.	
Blue Ridge	MTV	Provide ADS-B coverage while on the ground.	$100,000
Brookneal-Campbell County	0V4	Provide ADS-B coverage at 1000 AGL or lower.	
Charlottesville-Albemarle	CHO	Provide LAAS coverage to augment existing global positioning system.	
Charlottesville-Albemarle	CHO	Provide ADS-B coverage while on the ground.	$100,000
Chase City Municipal	CXE	Provide ADS-B coverage at 1000 AGL or lower.	
Chesapeake Regional	CPK	Provide LAAS coverage to augment existing global positioning system.	
Chesapeake Regional	CPK	Provide ADS-B coverage while on the ground.	$100,000
Chesterfield County	FCI	Provide LAAS coverage to augment existing global positioning system.	
Chesterfield County	FCI	Provide ADS-B coverage while on the ground.	$100,000
Culpeper Regional	CJR	Provide LAAS coverage to augment existing global positioning system.	
Culpeper Regional	CJR	Provide ADS-B coverage while on the ground.	$100,000
Danville Regional	DAN	Provide LAAS coverage to augment existing global positioning system.	
Danville Regional	DAN	Provide ADS-B coverage while on the ground.	$100,000
Dinwiddie County	PTB	Provide LAAS coverage to augment existing global positioning system.	
Dinwiddie County	PTB	Provide ADS-B coverage while on the ground.	$100,000
Emporia-Greensville Regional	EMV	Provide ADS-B coverage while on the ground.	$100,000
Farmville Regional	FVX	Provide ADS-B coverage while on the ground.	$100,000
Franklin Municipal	FKN	Provide ADS-B coverage at 1000 AGL or lower.	
Front Royal-Warren County	FRR	Provide ADS-B coverage at 1000 AGL or lower.	
Hampton Roads Executive	PVG	Provide LAAS coverage to augment existing global positioning system.	
Hampton Roads Executive	PVG	Provide ADS-B coverage while on the ground.	$100,000

Airport Name	ID	Recommended Improvement	Est. Cost
Hanover County Municipal	OFP	Provide LAAS coverage to augment existing global positioning system.	
Hanover County Municipal	OFP	Provide ADS-B coverage while on the ground.	$100,000
Ingalls Field	HSP	Provide LAAS coverage to augment existing global positioning system.	
Ingalls Field	HSP	Provide ADS-B coverage while on the ground.	$100,000
Lee County	0VG	Provide ADS-B coverage at 1000 AGL or lower.	
Leesburg Executive	JYO	Provide LAAS coverage to augment existing global positioning system.	
Leesburg Executive	JYO	Provide ADS-B coverage while on the ground.	$100,000
Lonesome Pine	LNP	Provide LAAS coverage to augment existing global positioning system.	
Lonesome Pine	LNP	Provide ADS-B coverage while on the ground.	$100,000
Louisa County	LKU	Provide ADS-B coverage at 1000 AGL or lower.	
Luray Caverns	W45	Provide ADS-B coverage at 1000 AGL or lower.	
Lynchburg Regional	LYH	Provide LAAS coverage to augment existing global positioning system.	
Lynchburg Regional	LYH	Provide ADS-B coverage while on the ground.	$100,000
Manassas Regional	HEF	Provide LAAS coverage to augment existing global positioning system.	
Manassas Regional	HEF	Provide ADS-B coverage while on the ground.	$100,000
Marks Municipal	W63	Provide ADS-B coverage at 1000 AGL or lower.	
Mecklenburg-Brunswick Regional	AVC	Provide ADS-B coverage while on the ground.	$100,000
Middle Peninsula Regional	FYJ	Provide LAAS coverage to augment existing global positioning system.	
Middle Peninsula Regional	FYJ	Provide ADS-B coverage while on the ground.	$100,000
Mountain Empire	MKJ	Provide ADS-B coverage while on the ground.	$100,000
New Kent County	W96	Provide ADS-B coverage at 1000 AGL or lower.	
New River Valley	PSK	Provide LAAS coverage to augment existing global positioning system.	
New River Valley	PSK	Provide ADS-B coverage while on the ground.	$100,000
Newport News-Williamsburg Int'l	PHF	Provide LAAS coverage to augment existing global positioning system.	
Newport News-Williamsburg Int'l	PHF	Provide ADS-B coverage while on the ground.	$100,000
Norfolk International	ORF	Provide LAAS coverage to augment existing global positioning system.	
Norfolk International	ORF	Provide ADS-B coverage while on the ground.	$100,000
Orange County	OMH	Provide ADS-B coverage at 1000 AGL or lower.	
Richmond International	RIC	Provide LAAS coverage to augment existing global positioning system.	
Richmond International	RIC	Provide ADS-B coverage while on the ground.	$100,000

Airport Name	ID	Recommended Improvement	Est. Cost
Roanoke Regional	ROA	Provide LAAS coverage to augment existing global positioning system.	
Roanoke Regional	ROA	Provide ADS-B coverage while on the ground.	$100,000
Shannon	EZF	Provide ADS-B coverage at 1000 AGL or lower.	
Shenandoah Valley Regional	SHD	Provide LAAS coverage to augment existing global positioning system.	
Shenandoah Valley Regional	SHD	Provide ADS-B coverage while on the ground.	$100,000
Stafford Regional	RMN	Provide LAAS coverage to augment existing global positioning system.	
Stafford Regional	RMN	Provide ADS-B coverage while on the ground.	$100,000
Suffolk Executive	SFQ	Provide LAAS coverage to augment existing global positioning system.	
Suffolk Executive	SFQ	Provide ADS-B coverage while on the ground.	$100,000
Tangier Island	TGI	Provide ADS-B coverage at 1000 AGL or lower.	
Tappahannock-Essex County	XSA	Provide ADS-B coverage while on the ground.	$100,000
Tazewell County	6V3	Provide ADS-B coverage while on the ground.	$100,000
Twin County	HLX	Provide ADS-B coverage at 1000 AGL or lower.	
Virginia Highlands	VJI	Provide ADS-B coverage while on the ground.	$100,000
Virginia Tech	BCB	Provide ADS-B coverage while on the ground.	$100,000
Wakefield Municipal	AKQ	Provide ADS-B coverage at 1000 AGL or lower.	
Warrenton-Fauquier	HWY	Provide LAAS coverage to augment existing global positioning system.	
Warrenton-Fauquier	HWY	Provide ADS-B coverage while on the ground.	$100,000
William M. Tuck	W78	Provide ADS-B coverage while on the ground.	$100,000
Williamsburg-Jamestown	JGG	Provide ADS-B coverage at 1000 AGL or lower.	
Winchester Regional	OKV	Provide LAAS coverage to augment existing global positioning system.	
Winchester Regional	OKV	Provide ADS-B coverage while on the ground.	$100,000
			$3,500,000

source: Consultant Recommendation

RECOMMENDATIONS APPROPRIATE FOR OTHER FUNDING PROGRAMS

The recommendations summarized in the following table are those which are well suited for funding outside of the Facilities and Equipment Program. In some cases, these projects are well-suited for Federal programs; in other cases, the improvements could be undertaken using funding from the Airport Capital Program. These recommendations are presented in order by airport name.

Table 9-12 – Recommendations Appropriate for Other Funding Programs

Airport Name	ID	Recommended Improvement	Est. Cost
Accomack County	MFV	Remove close-in obstructions (tree). (Runway 3)	
Accomack County	MFV	Remove close-in obstructions (trees). (Runway 21)	
Blackstone Municipal	BKT	Eliminate / reduce threshold displacement. Existing 700' displacement may be able to be reduced while maintaining 600' underrun safety area (road). (Runway 22)	$2,000,000
Blackstone Municipal	BKT	Remove close-in obstructions (tree). (Runway 4)	
Blackstone Municipal	BKT	Remove close-in obstructions (tree). (Runway 22)	
Blue Ridge	MTV	Remove close-in obstructions (tree). (Runway 30)	
Blue Ridge	MTV	Remove close-in obstructions (tree). (Runway 12)	
Bridgewater Air Park	VBW	Remove close-in obstructions (trees). (Runway 15)	
Bridgewater Air Park	VBW	Remove close-in obstructions. (Runway 33)	
Brookneal-Campbell County	0V4	Remove close-in obstructions (trees). (Runway 24)	
Brookneal-Campbell County	0V4	Remove close-in obstructions (trees). (Runway 6)	
Chase City Municipal	CXE	Remove close-in obstructions (trees). (Runway 18)	
Chase City Municipal	CXE	Remove close-in obstructions (trees). (Runway 36)	
Chesapeake Regional	CPK	Remove close-in obstructions. (Runway 5)	
Chesapeake Regional	CPK	Remove close-in obstructions. (Runway 23)	
Chesterfield County	FCI	Remove close-in obstructions (pole). (Runway 15)	
Culpeper Regional	CJR	Remove close-in obstructions (pole). (Runway 4)	
Culpeper Regional	CJR	Remove close-in obstructions (fence). (Runway 22)	
Danville Regional	DAN	Remove close-in obstructions (trees). (Runway 2)	
Danville Regional	DAN	Remove close-in obstructions (trees). (Runway 31)	
Dinwiddie County	PTB	Remove close-in obstructions (tree). (Runway 5)	
Dinwiddie County	PTB	Remove close-in obstructions (tree). (Runway 23)	
Farmville Regional	FVX	Remove close-in obstructions (tree). (Runway 21)	
Farmville Regional	FVX	Remove close-in obstructions (tree). (Runway 3)	
Franklin Municipal	FKN	Remove close-in obstructions (brush). (Runway 27)	
Franklin Municipal	FKN	Remove close-in obstructions (brush). (Runway 9)	
Front Royal-Warren County	FRR	Confirm and remove close-in obstructions.	

Airport Name	ID	Recommended Improvement	Est. Cost
Hampton Roads Executive	PVG	Remove close-in obstructions. (Runway 10)	
Hampton Roads Executive	PVG	Remove close-in obstructions (tree). (Runway 28)	
Hampton Roads Executive	PVG	Remove close-in obstructions. (Runway 2)	
Hanover County Municipal	OFP	Remove close-in obstructions. (Runway 34)	
Hummel Field	W75	Remove close-in obstructions. (Runway 1)	
Hummel Field	W75	Remove close-in obstructions. (Runway 19)	
Leesburg Executive	JYO	Remove close-in obstructions. (Runway 35)	
Lonesome Pine	LNP	Remove close-in obstructions. (Runway 24)	
Lonesome Pine	LNP	Remove close-in obstructions. (Runway 6)	
Louisa County	LKU	Remove close-in obstructions (tree). (Runway 27)	
Luray Caverns	W45	Remove close-in obstruction (tree). (Runway 22)	
Luray Caverns	W45	Remove close-in obstruction (tree). (Runway 4)	
Manassas Regional	HEF	Remove close-in obstruction (tree). (Runway 16L)	
Manassas Regional	HEF	Remove close-in obstruction (tree). (Runway 34R)	
Manassas Regional	HEF	Remove close-in obstruction (tree). (Runway 34L)	
Marks Municipal	W63	Remove close-in obstructions (trees). (Runway 4)	
Marks Municipal	W63	Remove close-in obstructions (trees). (Runway 22)	
Mecklenburg-Brunswick Regional	AVC	Remove close-in obstructions (trees). (Runway 1)	
Mecklenburg-Brunswick Regional	AVC	Remove close-in obstructions (trees). (Runway 19)	
Middle Peninsula Regional	FYJ	Remove close-in obstructions. (Runway 10)	
Mountain Empire	MKJ	Remove close-in obstructions. (Runway 26)	
Mountain Empire	MKJ	Remove close-in obstructions. (Runway 8)	
New Kent County	W96	Remove close-in obstructions. (Runway 28)	
New Kent County	W96	Remove obstructions surrounding rotating beacon.	
New Kent County	W96	Remove close-in obstructions. (Runway 10)	
New River Valley	PSK	Improve radar coverage for west and north sectors of Roanoke's radar system.	
New River Valley	PSK	Remove close-in obstructions. (Runway 6)	
New River Valley	PSK	Remove close-in obstructions. (Runway 24)	
Newport News-Williamsburg Int'l	PHF	Remove close-in obstructions (tree). (Runway 7)	
Newport News-Williamsburg Int'l	PHF	Remove close-in obstructions. (Runway 25)	
Newport News-Williamsburg Int'l	PHF	Remove close-in obstructions (tree). (Runway 20)	
Norfolk International	ORF	Displace landing threshold approximately 600'. Requires relocation of PAPI, glideslope and approach lighting system. (Runway 23)	$500,000

Airport Name	ID	Recommended Improvement	Est. Cost
Norfolk International	ORF	Remove close-in obstructions (trees). (Runway 5)	
Norfolk International	ORF	Remove close-in obstructions (trees). (Runway 23)	
Norfolk International	ORF	Remove close-in obstructions (trees). (Runway 32)	
Orange County	OMH	Remove close-in obstructions (tree). (Runway 8)	
Orange County	OMH	Remove close-in obstructions (tree). (Runway 26)	
Roanoke Regional	ROA	Improve radar coverage for west and north sectors.	
Shannon	EZF	Remove close-in obstructions (trees). (Runway 24)	
Shannon	EZF	Remove close-in obstructions. (Runway 6)	
Shenandoah Valley Regional	SHD	Provide improved radar coverage.	
Shenandoah Valley Regional	SHD	Remove close-in obstructions. (Runway 5)	
Shenandoah Valley Regional	SHD	Remove close-in obstructions. (Runway 23)	
Smith Mountain Lake	W91	Remove close-in obstructions. (Runway 23)	
Smith Mountain Lake	W91	Remove close-in obstructions. (Runway 5)	
Stafford Regional	RMN	Remove close-in obstructions. (Runway 33)	
Stafford Regional	RMN	Remove close-in obstructions (ground). (Runway 15)	
Suffolk Executive	SFQ	Remove close-in obstructions. (Runway 4)	
Suffolk Executive	SFQ	Remove close-in obstructions. (Runway 22)	
Tangier Island	TGI	Remove close-in obstructions (pole). (Runway 2)	
Tazewell County	6V3	Remove close-in obstructions (trees). (Runway 7)	
Twin County	HLX	Remove close-in obstructions (pole). (Runway 19)	
Twin County	HLX	Remove close-in obstructions (tree). (Runway 1)	
Virginia Highlands	VJI	Remove close-in obstructions (trees). (Runway 24)	
Virginia Highlands	VJI	Remove close-in obstructions (trees). (Runway 6)	
Virginia Tech	BCB	Improve radar coverage for west and north sectors of Roanoke's radar system.	
Virginia Tech	BCB	Remove close-in obstructions (brush). (Runway 30)	
Wakefield Municipal	AKQ	Remove close-in obstructions (trees). (Runway 20)	
Wakefield Municipal	AKQ	Remove close-in obstructions (trees). (Runway 2)	
Warrenton-Fauquier	HWY	Remove close-in obstructions. (Runway 14)	
William M. Tuck	W78	Remove close-in obstructions (tree). (Runway 1)	
William M. Tuck	W78	Remove close-in obstructions. (Runway 19)	
Williamsburg-Jamestown	JGG	Remove close-in obstructions (trees). (Runway 31)	
Williamsburg-Jamestown	JGG	Remove close-in obstructions (trees). (Runway 13)	
Winchester Regional	OKV	Remove close-in obstructions (tree). (Runway 14)	
			$2,500,000

source: Consultant Recommendation

Appendix A - TECHNICAL COMMITTEE

The Technical Committee for the Study was responsible for project scoping, steering and review. The Technical Committee consisted of:

Table A-1 – Technical Committee Members

Organization	Contacts
Delta Airport Consultants, Inc. 9711 Farrar Court, Suite 100 Richmond, Virginia 23236 www.deltaairport.com	Charles D. Lamb, P.E. Courtney A. Beamon, P.E. Marshall R. Eichfeld, P.E.
Virginia Tech Air Transportation Systems Laboratory Virginia Tech 200 Patton Hall Blacksburg, Virginia 24061 www.atsl.cee.vt.edu	Antonio A. Trani, Ph.D., P.E. Nicolas Hinze Howard Swingle
Virginia Department of Aviation 5702 Gulfstream Road Richmond, Virginia 23250-2422 www.doav.virginia.gov	P. Clifford Burnette, Jr. Vernon W. Carter, Jr. J. Michael Swain R. N. Harrington
Federal Aviation Administration Washington Airports District Office 23723 Air Freight Lane, Suite 210 Dulles, Virginia 20166 www.faa.gov	various
Federal Aviation Administration Eastern Flight Procedures Office 1701 Columbia Avenue College Park, Georgia 30337 www.faa.gov	Bobby McCullar

source: Consultant's Records

Appendix B - ADVISORY COMMITTEE

As part of the Study, an Advisory Committee was formed as a forum for user input and participation. The Advisory Committee included the following representatives:

Table B-1 – Advisory Committee Members

Organization	Contacts
National Business Aircraft Association	Harry Houckes Bob Lamond
Federal Aviation Administration Potomac Consolidated TRACON	Stephen L. Smith
Virginia Aviation Business Association	Mike Mickel Dominion Aviation Services
Virginia Airport Operators Council	Mark F. Courtney, AAE Lynchburg Regional Airport L. William Kelly, III, CM New Kent County Airport
Virginia Department of Aviation Flight Operations	David Hope

source: Consultant's Records

Appendix C - INVENTORY

While most of the collected inventory information is summarized in other portions of the Study, a compilation of the inventory information is included, in full, in this Appendix.

Table C-1 - Inventory

	NAVAID name	NAVAID id	NAVAID Equipment	NAVAID Frequency	Associated Airport	Associated Runway	Date of Commissioning	Condition Assessment	Ownership	Model	NADIN
	Armel	AML	VORTAC	113.50			6/14/1974	not available	FAA		
VOR or VORTAC	Brooke	BRV	VORTAC	114.50			2/29/1960	not available	FAA		
	Cape Charles	CCV	VORTAC	112.20			7/2/1993	not available	FAA		
VOR or VORTAC	Casanova	CSN	VORTAC	116.30			not available	not available	FAA		
	Danville	DAN	VOR	113.10			4/29/1959	not available	FAA		
VOR or VORTAC	Flat Rock	FAK	VORTAC	113.30			9/13/1967	not available	FAA		
	Franklin	FKN	VORTAC	110.30			5/2/1965	not available	FAA		
VOR or VORTAC	Glade Spring	GZG	VOR/DME	110.20			11/22/1991	not available	FAA		
	Gordonsville	GVE	VORTAC	115.60			5/9/1996	not available	FAA		
VOR or VORTAC	Harcum	HCM	VORTAC	108.80			not available	not available	FAA		
	Hopewell	HPW	VORTAC	112.00			11/6/1959	not available	FAA		
VOR or VORTAC	Lawrenceville	LVL	VORTAC	112.90			4/12/1954	not available	FAA		
	Linden	LDN	VORTAC	114.30			not available	not available	FAA		
VOR or VORTAC	Lynchburg	LYH	VORTAC	109.20			not available	not available	FAA		
	Montebello	MOL	VOR/DME	115.30			not available	not available	FAA		
VOR or VORTAC	Norfolk	ORF	VORTAC	116.90			10/15/1958	not available	FAA		
	Pulaski	PSK	VORTAC	116.80			10/16/1959 & 11/01/2002	not available	FAA		
VOR or VORTAC	Richmond	RIC	VORTAC	114.10			10/6/1958	not available	FAA		
	Roanoke	ROA	VORTAC	109.40			not available	not available	FAA		
VOR or VORTAC	South Boston	SBV	VORTAC	110.40			6/29/1965 (TACAN)	not available	FAA		
	Woodrum	ODR	VOR	114.90			11/24/1987	not available	FAA		
	A.P. Hill	APH	NDB/M	396			1/27/1982	not available	US Army		
NDB	Accomack	BDB	NDB/M	336			1/22/2001	Fair	DOAV	SAC SS-250C-NDB	
	Azalea Park	AZS	NDB/M	336			10/1/1991	not available	FAA		
NDB	Bales	UVM	NDB/M	396			9/12/1984	Good	DOAV	SAC SS-250C-NDB	
	Blackstone	BKT	NDB/M	326			1/24/1963	not available	FAA		
NDB	Bojar	LYH	NDB/M	385			10/21/1993	not available	FAA		
	Bridgewater	VBW	NDB/M	241			2/20/1969 & 2/3/2003	Good	DOAV	SAC SS-250C-NDB	

NAVAID Type	NAVAID name	NAVAID id	NAVAID Equipment	NAVAID Frequency	Associated Airport	Associated Runway	Date of Commissioning	Condition Assessment	Ownership	Model	NADIN
NDB	Caverns	LUA	NDB/M	245			12/11/1975	Fair	DOAV	SAC SS-250C-NDB	
NDB	Emporia	ELQ	NDB/M	261			11/15/2000	Good	DOAV	SAC SS-250C-NDB	
NDB	Farmville	FVX	NDB/M	367			8/13/1970	Fair	DOAV	SAC SS-250C-NDB	
NDB	Felker	FAF	NDB/M	226			7/5/1984	not available	US Army		
NDB	Henry	PJS	NDB/M	375			2/14/1980	not available	FAA		
NDB	Hillsville	HLX	NDB/M	269			3/18/1969	Good	DOAV	SAC SS-250C-NDB	
NDB	Ingle	ORFOR	NDB/C	329			2/4/1983	not available	FAA		
NDB	Jones	AEA	NDB/M	373			8/10/1999	Good	DOAV	SAC SS-250C-NDB	
NDB	Nailr	MSQ	NDB/M	351			5/10/2006	Excellent	DOAV	SAC SS-250C-NDB	
NDB	Petersburg	PTB	NDB/M	284			1/28/1969	Excellent	DOAV	SAC SS-250C-NDB	
NDB	Portsmouth	PVG	NDB/M	241			3/20/1969	survey not completed	DOAV	SAC SS-250C - NDB	
NDB	Shannon	EZF	NDB/M	237			8/2/1989	survey not completed	DOAV	SAC SS-250C-NDB	
NDB	Staut	SHDSH	NDB/C	375			2/11/1988	not available	FAA		
NDB	Suzze	MKJ	NDB/M	335			5/2/1991	Poor	DOAV	SAC SS-250C-NDB	
NDB	Tech	TEC	NDB/M	368			9/22/1969 & 1/25/00	Excellent	DOAV	SAC SS-250C-NDB	
NDB	Vinton	VIT	NDB/M	277			8/31/1967 & 10/7/1999	not available	FAA		
NDB	Wakefield	AKQ	NDB/M	274			7/9/1970	Fair	DOAV	SAC SS-250C-NDB	
NDB	Waley	RKH	NDB/M	249			11/18/1996	Fair	DOAV	SAC SS-250C-NDB	
NDB	Whine	VJI	NDB/M	236			11/21/1989	Fair	DOAV	SAC SS-250C-NDB	
GS / LOC / DME / Beacon		I-AJU	DME	82X	IAD	Runway 12	not available	not available (FAA)	FAA	not available	
GS / LOC / DME / Beacon		I-AJU	GS	332	IAD	Runway 12	11/23/1976	not available (FAA)	FAA	WL MK1F	
GS / LOC / DME / Beacon		I-AJU	LOC	109.3	IAD	Runway 12	11/23/1992	not available (FAA)	FAA	WL MK1F	
GS / LOC / DME / Beacon		I-AJU	MM	n/a	IAD	Runway 12	11/30/1976	not available (FAA)	FAA	not available	
GS / LOC / DME / Beacon		I-ASO	DME	36X	DCA	Runway 19	5/20/1984	not available (FAA)	FAA	not available	
GS / LOC / DME / Beacon		I-ASO	GS	333.8	DCA	Runway 19	6/27/1984	not available (FAA)	FAA	WILCOX	
GS / LOC / DME / Beacon		I-ASO	LOC	109.9	DCA	Runway 19	4/21/1984	not available (FAA)	FAA	MARK 1F	
GS / LOC / DME / Beacon		I-AVC	LOC	110.5	AVC	Runway 1	8/9/1999	Fair	DOAV	ASII - 1100	
GS / LOC / DME / Beacon		I-BCB	DME	28X	BCB	Runway 12	9/15/1992	Good	DOAV	Wilcox 596C	
GS / LOC / DME / Beacon		I-BCB	LOC	109.1	BCB	Runway 12	4/3/1989	Good	DOAV	Wilcox MK 1F	
GS / LOC / DME / Beacon		I-BNE	DME	88X	RIC	Runway 34	not available	not available (FAA)	FAA	not available	
GS / LOC / DME / Beacon		I-BNE	GS	330.2	RIC	Runway 34	12/21/1995	not available (FAA)	FAA	WL MK20	
GS / LOC / DME / Beacon		I-BNE	IM	n/a	RIC	Runway 34	12/21/1995	not available (FAA)	FAA	not available	
GS / LOC / DME / Beacon		I-BNE	LOC	110.7	RIC	Runway 34	9/11/1975	not available (FAA)	FAA	WL MK20	
GS / LOC / DME / Beacon		I-BNE	MM	n/a	RIC	Runway 34	12/21/1995	not available (FAA)	FAA	not available	

NAVAID Type	NAVAID name	NAVAID id	NAVAID Equipment	NAVAID Frequency	Associated Airport	Associated Runway	Date of Commissioning	Condition Assessment	Ownership	Model	NADIN
GS / LOC / DME / Beacon	Kafka	I-BNE	OM	n/a	RIC	Runway 34	12/21/1995	not available (FAA)	FAA	not available	
GS / LOC / DME / Beacon		I-CFU	DME	20X	FCI	Runway 33	2/21/1991	survey not completed	DOAV	Wilcox 596C	
GS / LOC / DME / Beacon		I-CFU	GS	334.1	FCI	Runway 33	6/4/1998	Good	DOAV	Wilcox MK 10	
GS / LOC / DME / Beacon		I-CFU	LOC	108.3	FCI	Runway 33	5/31/1988	Excellent	DOAV	Wilcox MK 1F	
GS / LOC / DME / Beacon		I-CHO	GS	333.5	CHO	Runway 3	7/19/1995 & 08/14/03	not available (FAA)	FAA	WL MK1F	
GS / LOC / DME / Beacon		I-CHO	LOC	111.7	CHO	Runway 3	7/28/1984	not available (FAA)	FAA	WL MK1F	
GS / LOC / DME / Beacon		I-DAN	GS	330.2	DAN	Runway 2	4/6/1989 & 08/10/06	not available (FAA)	FAA	Wilcox	
GS / LOC / DME / Beacon		I-DAN	LOC	110.7	DAN	Runway 2	10/12/1979	not available (FAA)	FAA	MARK 1F	
GS / LOC / DME / Beacon	Fabic	I-DAN	OM	n/a	DAN	Runway 2	03/27/96	not available (FAA)	FAA	not available	
GS / LOC / DME / Beacon		I-DCA	DME	36X	DCA	Runway 1	5/20/1984	not available (FAA)	FAA	not available	
GS / LOC / DME / Beacon		I-DCA	GS	333.8	DCA	Runway 1	5/15/1996	not available (FAA)	FAA	WL MK20	
GS / LOC / DME / Beacon		I-DCA	LOC	109.9	DCA	Runway 1	5/7/1996	not available (FAA)	FAA	WL MK20	
GS / LOC / DME / Beacon		I-DCA	MM		DCA	Runway 1	5/9/1996	not available (FAA)	FAA	not available	
GS / LOC / DME / Beacon	Oxonn	I-DCA	OM	n/a	DCA	Runway 1	8/14/1996	not available (FAA)	FAA	not available	
GS / LOC / DME / Beacon		I-DHY	DME	38X	PHF	Runway 25	3/9/2005	not available (FAA)	FAA	not available	
GS / LOC / DME / Beacon		I-DHY	GS	334.4	PHF	Runway 25	3/9/2005	not available (FAA)	FAA	MK20A	
GS / LOC / DME / Beacon		I-DHY	LOC	110.1	PHF	Runway 25	3/9/2005	not available (FAA)	FAA	MK20A	
GS / LOC / DME / Beacon		I-DLX	DME	82X	IAD	Runway 19C	not available	not available (FAA)	FAA	not available	
GS / LOC / DME / Beacon		I-DLX	GS	332.3	IAD	Runway 19C	4/5/1990 & 12/11/2003	not available (FAA)	FAA	MK20	
GS / LOC / DME / Beacon		I-DLX	IM	n/a	IAD	Runway 19C	12/6/2004	not available (FAA)	FAA	not available	
GS / LOC / DME / Beacon		I-DLX	LOC	111.3	IAD	Runway 19C	10/1/1976 & 12/15/2004	not available (FAA)	FAA	MK20	
GS / LOC / DME / Beacon		I-DZH	LOC	109.95	CJR	Runway 4	3/14/2006	Excellent	DOAV	ASII	
GS / LOC / DME / Beacon		I-EMV	LOC	108.75	EMV	Runway 33	11/15/2000	Poor	DOAV	ASII - 1100	
GS / LOC / DME / Beacon		I-EYK	DME	20X	CPK	Runway 5	1/9/2003	Excellent	DOAV	ASII - 1118	
GS / LOC / DME / Beacon		I-EYK	GS	333.5	CPK	Runway 5	10/8/2002	Good	DOAV	ASII - 2100	
GS / LOC / DME / Beacon		I-EYK	LOC	111.7	CPK	Runway 5	9/22/1994	Good	DOAV	Wilcox MK 1F	
GS / LOC / DME / Beacon		I-EZD	DME	88X	RIC	Runway 2	not available	not available (FAA)	FAA	not available	
GS / LOC / DME / Beacon		I-EZD	GS	330.8	RIC	Runway 2	4/20/1990	not available (FAA)	FAA	WILCOX	
GS / LOC / DME / Beacon		I-EZD	LOC	110.9	RIC	Runway 2	4/20/1990	not available (FAA)	FAA	WILCOX	
GS / LOC / DME / Beacon		I-HEF	GS	331.4	HEF	Runway 16L	5/9/1983	not available (FAA)	FAA	Wilcox	
GS / LOC / DME / Beacon		I-HEF	LOC	109.1	HEF	Runway 16L	4/28/1983	not available (FAA)	FAA	Wilcox	
GS / LOC / DME / Beacon		I-HSP	GS	330.5	HSP	Runway 25	5/9/1984	not available (FAA)	FAA	ST	
GS / LOC / DME / Beacon		I-HSP	LOC	108.7	HSP	Runway 25	5/9/1984	not available (FAA)	FAA	Wilcox	
GS / LOC / DME / Beacon	Duran	I-HSP	OM	n/a	HSP	Runway 25	11/27/1974	not available (FAA)	FAA	not available	
GS / LOC / DME / Beacon		I-HWY	DME	not available	HWY	Runway 15	not available	new	DOAV	not available	

NAVAID Type	NAVAID name	NAVAID id	NAVAID Equipment	NAVAID Frequency	Associated Airport	Associated Runway	Date of Commissioning	Condition Assessment	Ownership	Model	NADIN
GS / LOC / DME / Beacon		I-HWY	GS	338.5	HWY	Runway 15	pending	new	DOAV	not available	
GS / LOC / DME / Beacon		I-HWY	LOC	109.75	HWY	Runway 15	pending	new	DOAV	AMS 2100	
GS / LOC / DME / Beacon		I-IAD	DME	38X	IAD	Runway 1R	5/12/2005	not available (FAA)	FAA	not available	
GS / LOC / DME / Beacon		I-IAD	GS	334.4	IAD	Runway 1R	4/3/1996	not available (FAA)	FAA	WLMK20	
GS / LOC / DME / Beacon		I-IAD	IM	n/a	IAD	Runway 1R	3/25/1996	not available (FAA)	FAA	not available	
GS / LOC / DME / Beacon		I-IAD	LOC	110.1	IAD	Runway 1R	3/25/1996	not available (FAA)	FAA	WLMK20	
GS / LOC / DME / Beacon		I-IAD	MM	n/a	IAD	Runway 1R	3/26/1996	not available (FAA)	FAA	not available	
GS / LOC / DME / Beacon	Tille	I-IAD	OM	n/a	IAD	Runway 1R	3/26/1996	not available (FAA)	FAA	not available	
GS / LOC / DME / Beacon		I-ISU	DME	44Y	IAD	Runway 19R	8/25/2008	not available (FAA)	FAA	not available	
GS / LOC / DME / Beacon		I-ISU	GS	330.05	IAD	Runway 19R	8/26/2008	not available (FAA)	FAA	MK20A	
GS / LOC / DME / Beacon		I-ISU	IM	n/a	IAD	Runway 19R	not available	not available (FAA)	FAA	not available	
GS / LOC / DME / Beacon		I-ISU	LOC	110.75	IAD	Runway 19R	8/25/2008	not available (FAA)	FAA	MK20A	
GS / LOC / DME / Beacon		I-JLS	LOC	110.3	PTB	Runway 5	5/19/1995	Excellent	DOAV	Wilcox MK 1F	
GS / LOC / DME / Beacon		I-JYO	DME	54Y	JYO	Runway 17	3/13/1991 & 4/3/2008	survey not completed	DOAV	Wilcox 596C	
GS / LOC / DME / Beacon		I-JYO	LOC	111.75	JYO	Runway 17	3/13/1991 & 4/2/2008	survey not completed	DOAV	Wilcox MK 1F	
GS / LOC / DME / Beacon		I-JZQ	DME	28X	ORF	Runway 23	10/26/1982 & 8/16/2001	not available (FAA)	FAA	not available	
GS / LOC / DME / Beacon		I-JZQ	GS	331.4	ORF	Runway 23	9/28/1982	not available (FAA)	FAA	WILCOX	
GS / LOC / DME / Beacon		I-JZQ	LOC	109.1	ORF	Runway 23	9/27/1982	not available (FAA)	FAA	WILCOX	
GS / LOC / DME / Beacon		I-JZQ	MM	n/a	ORF	Runway 23	9/28/1982	not available (FAA)	FAA	not available	
GS / LOC / DME / Beacon		I-LKU	DME	103X	LKU	Runway 27	not available	survey not completed	DOAV	not available	
GS / LOC / DME / Beacon		I-LKU	LOC	108.55	LKU	Runway 27	10/31/1995	Excellent	DOAV	Wilcox MK 10	
GS / LOC / DME / Beacon		I-LYH	DME	29X	LYH	Runway 4	not available	not available (FAA)	FAA	not available	
GS / LOC / DME / Beacon		I-LYH	GS	334.4	LYH	Runway 4	4/15/1984 & 11/28/2007	not available (FAA)	FAA	WL MK1F	
GS / LOC / DME / Beacon		I-LYH	LOC	110.1	LYH	Runway 4	4/13/1984 & 8/15/2007	not available (FAA)	FAA	MARK 1F	
GS / LOC / DME / Beacon	Bojar	I-LYH	OM	n/a	LYH	Runway 4	4/14/1984	not available (FAA)	FAA	not available	
GS / LOC / DME / Beacon		I-MFV	LOC	110.15	MFV	Runway 3	7/13/2001	Excellent	DOAV	ASII - 1100	
GS / LOC / DME / Beacon		I-MKJ	LOC	110.5	MKJ	Runway 26	3/27/1991	Good	DOAV	Wilcox MK 1F	
GS / LOC / DME / Beacon		I-OFP	DME	34X	OFP	Runway 16	11/6/1996	Fair	DOAV	Wilcox 5960	
GS / LOC / DME / Beacon		I-OFP	LOC	109.7	OFP	Runway 16	6/6/1989	survey not completed	DOAV	Wilcox MK 1F	
GS / LOC / DME / Beacon		I-OIU	DME	44Y	IAD	Runway 1L	8/25/2008	not available (FAA)	FAA	not available	
GS / LOC / DME / Beacon		I-OIU	GS	330.05	IAD	Runway 1L	9/3/2008	not available (FAA)	FAA	MK20A	
GS / LOC / DME / Beacon		I-OIU	IM	n/a	IAD	Runway 1L	not available	not available (FAA)	FAA	not available	
GS / LOC / DME / Beacon		I-OIU	LOC	110.75	IAD	Runway 1L	8/26/2008	not available (FAA)	FAA	MK20A	
GS / LOC / DME / Beacon		I-ORF	DME	28X	ORF	Runway 5	10/26/1982 & 8/16/2001	not available (FAA)	FAA	not available	
GS / LOC / DME / Beacon		I-ORF	GS	331.4	ORF	Runway 5	3/7/1985	not available (FAA)	FAA	WILCOX	

NAVAID Type	NAVAID name	NAVAID id	NAVAID Equipment	NAVAID Frequency	Associated Airport	Associated Runway	Date of Commissioning	Condition Assessment	Ownership	Model	NADIN
GS / LOC / DME / Beacon		I-ORF	LOC	109.1	ORF	Runway 5	4/25/1986	not available (FAA)	FAA	WILCOX	
GS / LOC / DME / Beacon		I-ORF	MM	n/a	ORF	Runway 5	11/4/1982	not available (FAA)	FAA	not available	
GS / LOC / DME / Beacon	Ingle	I-ORF	OM	n/a	ORF	Runway 5	2/4/1983	not available (FAA)	FAA	not available	
GS / LOC / DME / Beacon		I-OSZ	DME	82X	IAD	Runway 1C	not available	not available (FAA)	FAA	not available	
GS / LOC / DME / Beacon		I-OSZ	GS	332.3	IAD	Runway 1C	4/8/1977	not available (FAA)	FAA	WL MK20	
GS / LOC / DME / Beacon		I-OSZ	LOC	111.3	IAD	Runway 1C	4/7/1977	not available (FAA)	FAA	WL MK20	
GS / LOC / DME / Beacon		I-OSZ	MM	n/a	IAD	Runway 1C	4/8/1977	not available (FAA)	FAA	not available	
GS / LOC / DME / Beacon		I-OWN	DME	44X	LNP	Runway 24	3/28/91 & 11/1/2006	not available (FAA)	FAA	Wilcox 596C	
GS / LOC / DME / Beacon		I-OWN	GS	330.2	LNP	Runway 24	not available	not available (FAA)	FAA	not available	
GS / LOC / DME / Beacon		I-OWN	LOC	110.7	LNP	Runway 24	12/18/1980 & 11/1/2006	not available (FAA)	FAA	ASII - 1100	
GS / LOC / DME / Beacon		I-PHF	DME	38X	PHF	Runway 7	3/9/2005	not available (FAA)	FAA	not available	
GS / LOC / DME / Beacon		I-PHF	GS	334.4	PHF	Runway 7	5/21/1981	not available (FAA)	FAA	MARK 1F	
GS / LOC / DME / Beacon		I-PHF	LOC	110.1	PHF	Runway 7	5/9/1989 & 3/30/2006	not available (FAA)	FAA	MK 20	
GS / LOC / DME / Beacon		I-PHF	MM	n/a	PHF	Runway 7		not available (FAA)	FAA		
GS / LOC / DME / Beacon		I-PSK	DME	115X	PSK	Runway 6	not available	not available (FAA)	FAA	not available	
GS / LOC / DME / Beacon		I-PSK	GS	330.8	PSK	Runway 6	4/11/1974	not available (FAA)	FAA	WL MK1F	
GS / LOC / DME / Beacon		I-PSK	LOC	110.9	PSK	Runway 6	4/6/1972	not available (FAA)	FAA	WL MK1F	
GS / LOC / DME / Beacon	Jesta	I-PSK	OM	n/a	PSK	Runway 6	not available	not available (FAA)	FAA	not available	
GS / LOC / DME / Beacon		I-RGJ	DME	88X	RIC	Runway 16	not available	not available (FAA)	FAA	not available	
GS / LOC / DME / Beacon		I-RGJ	GS	330.2	RIC	Runway 16	2/14/1976	not available (FAA)	FAA	WL MK1F	
GS / LOC / DME / Beacon		I-RGJ	LOC	110.7	RIC	Runway 16	9/28/1994 & 05/07/03	not available (FAA)	FAA	WL MK1F	
GS / LOC / DME / Beacon		I-RGJ	MM	n/a	RIC	Runway 16	not available	not available (FAA)	FAA	not available	
GS / LOC / DME / Beacon		I-RKH	LOC	111.5	SFQ	Runway 4	11/27/1996	Good	DOAV	Wilcox MK 10	
GS / LOC / DME / Beacon		I-RMN	DME	24Y	RMN	Runway 33	not available	Excellent	DOAV	ASII - 1118	
GS / LOC / DME / Beacon		I-RMN	GS	330.35	RMN	Runway 33	3/5/2994	Excellent	DOAV	ASII - 2100	
GS / LOC / DME / Beacon		I-RMN	LOC	108.75	RMN	Runway 33	12/4/2003	Excellent	DOAV	ASII - 2100	
GS / LOC / DME / Beacon		I-ROA	GS	333.2	ROA	Runway 33	6/9/1988 & 3/3/2006	not available (FAA)	FAA	Wilcox	
GS / LOC / DME / Beacon		I-ROA	LOC	109.7	ROA	Runway 33	4/16/1984	not available (FAA)	FAA	Wilcox	
GS / LOC / DME / Beacon	Knoll	I-ROA	OM	n/a	ROA	Runway 33	4/16/1984	not available (FAA)	FAA	not available	
GS / LOC / DME / Beacon		I-SGC	DME	38X	IAD	Runway 19L	5/12/2005	not available (FAA)	FAA	not available	
GS / LOC / DME / Beacon		I-SGC	GS	334.4	IAD	Runway 19L	5/23/1972	not available (FAA)	FAA	WLMK20	
GS / LOC / DME / Beacon		I-SGC	LOC	110.1	IAD	Runway 19L	5/23/1972	not available (FAA)	FAA	WLMK20	
GS / LOC / DME / Beacon		I-SHD	GS	332.6	SHD	Runway 5	1/27/1992 & 4/17/2002	not available (FAA)	FAA	T1	
GS / LOC / DME / Beacon		I-SHD	LOC	109.5	SHD	Runway 5	9/8/1984	not available (FAA)	FAA	Wilcox	
GS / LOC / DME / Beacon	Staut	I-SHD	OM	n/a	SHD	Runway 5	9/8/1984	not available (FAA)	FAA	not available	

NAVAID Type	NAVAID name	NAVAID id	NAVAID Equipment	NAVAID Frequency	Associated Airport	Associated Runway	Date of Commissioning	Condition Assessment	Ownership	Model	NADIN
GS / LOC / DME / Beacon		I-SZK	DME	48X	ROA	Runway 6	6/21/2006	not available (FAA)	FAA	not available	
GS / LOC / DME / Beacon		I-SZK	GS	331.7	ROA	Runway 6	8/23/1977 & 6/21/2006	not available (FAA)	FAA	WLMK1F	
GS / LOC / DME / Beacon		I-SZK	LOC	111.1	ROA	Runway 6	8/23/1977 & 7/27/2006	not available (FAA)	FAA	WLMK1F	
GS / LOC / DME / Beacon	Skirt	I-SZK	OM	n/a	ROA	Runway 6	8/23/1977 & 6/21/2006	not available (FAA)	FAA	not available	
GS / LOC / DME / Beacon		I-TZX	DME	32Y	OKV	Runway 32	12/4/1991	Good	DOAV	Wilcox 596C	
GS / LOC / DME / Beacon		I-TZX	GS	332.45	OKV	Runway 32	10/30/1997 & 8/21/2006	Good	DOAV	ASII - 1100	
GS / LOC / DME / Beacon		I-TZX	LOC	109.55	OKV	Runway 32	12/4/1991	Excellent	DOAV	Wilcox MK 1F	
GS / LOC / DME / Beacon		I-UVM	DME	50X	MTV	Runway 30	5/8/89 & 11/30/99	Good	DOAV	Wilcox 596C	
GS / LOC / DME / Beacon		I-UVM	LOC	111.3	MTV	Runway 30	12/18/85 & 11/30/99	Good	DOAV	ASII - 1100	
GS / LOC / DME / Beacon	Bales	I-UVM	OM	n/a	MTV	Runway 30	12/18/1985	Fair	DOAV	Wilcox MK 1E	
GS / LOC / DME / Beacon		I-VJI	DME	20X	VJI	Runway 24	9/27/1995	Excellent	DOAV	Wilcox 5960	
GS / LOC / DME / Beacon		I-VJI	LOC	108.3	VJI	Runway 24	11/21/1989	Good	DOAV	Wilcox MK 1F	
Radar			ASR-9		CHO		2/8/1996	not available	FAA		
Radar			ASR-9		DCA		7/27/1998	not available	FAA		
Radar			ASR-9		IAD		11/18/1993	not available	FAA		
Radar			ASR-9		LYH		6/3/1999	not available	FAA		
Radar			ASR-9		ORF		11/3/1993	not available	FAA		
Radar			ASR-9		RIC		9/30/1993	not available	FAA		
Radar			ASR-8		ROA		2/22/1995	not available	FAA		
Approach Lighting System			ODALS		BCB	Runway 12	9/8/2005	not available	Local		
Approach Lighting System			MALSR		CHO	Runway 3	12/1/2005	not available	FAA		
Approach Lighting System			MALSR		CPK	Runway 5	not available	not available	DOAV		
Approach Lighting System			MALSR		DAN	Runway 2	not available	not available	FAA		
Approach Lighting System			ALSF 2		DCA	Runway 1	8/7/1990	not available	FAA		
Approach Lighting System			MALSF		DCA	Runway 19	not available	not available	FAA		
Approach Lighting System			MALSR		FCI	Runway 33	not available	not available	DOAV		
Approach Lighting System			MALSR		HEF	Runway 16L	not available	not available	FAA		
Approach Lighting System			MALSR		IAD	Runway 12	not available	not available	FAA		
Approach Lighting System			ALSF 2		IAD	Runway 19C	12/6/2004	not available	FAA		
Approach Lighting System			MALSR		IAD	Runway 19L	not available	not available	FAA		
Approach Lighting System			ALSF 2		IAD	Runway 19R	11/3/2008	not available	FAA		
Approach Lighting System			ALSF 2		IAD	Runway 1C	not available	not available	FAA		
Approach Lighting System			ALSF 2		IAD	Runway 1L	11/3/2008	not available	FAA		

NAVAID Type	NAVAID name	NAVAID id	NAVAID Equipment	NAVAID Frequency	Associated Airport	Associated Runway	Date of Commissioning	Condition Assessment	Ownership	Model	NADIN
Approach Lighting System			ALSF 2		IAD	Runway 1R	not available	not available	FAA		
Approach Lighting System			ODALS (nstd)		JYO	Runway 17	9/8/2005	not available	Local		
Approach Lighting System			ODALS		LNP	Runway 24	not available	not available	Local		
Approach Lighting System			MALSR		LYH	Runway 4	8/4/2008	not available	FAA		
Approach Lighting System			ODALS		MTV	Runway 30	not available	not available	Local		
Approach Lighting System			MALSR		OKV	Runway 32	not available	not available	DOAV		
Approach Lighting System			MALSR		ORF	Runway 23	8/3/2000	not available	FAA		
Approach Lighting System			MALSR		ORF	Runway 5	not available	not available	FAA		
Approach Lighting System			MALSR		PHF	Runway 7	6/22/1987	not available	FAA		
Approach Lighting System			MALSR		PSK	Runway 6	not available	not available	FAA		
Approach Lighting System			ODALS		PTB	Runway 5	not available	not available	Local		
Approach Lighting System			MALSR		RIC	Runway 16	not available	not available	FAA		
Approach Lighting System			MALSR		RIC	Runway 2	11/14/1996	not available	FAA		
Approach Lighting System			ALSF 2		RIC	Runway 34	5/30/1985	not available	FAA		
Approach Lighting System			MALS		RMN	Runway 33	1/29/2007	not available	DOAV		
Approach Lighting System			MALSR		ROA	Runway 33	12/6/1988	not available	FAA		
Approach Lighting System			MALSR		ROA	Runway 6	not available	not available	FAA		
Approach Lighting System			MALSR		SHD	Runway 5	10/2/2002	not available	FAA		
Approach Lighting System			ODALS		VJI	Runway 24	not available	not available	Local		
Approach Path Indicators			PAPI		0VG	RUNWAY 25	not available	not available			
Approach Path Indicators			PAPI		0VG	RUNWAY 7	not available	not available			
Approach Path Indicators			PAPI		6V3	RUNWAY 25	not available	not available			
Approach Path Indicators			PAPI		6V3	RUNWAY 7	not available	not available			
Approach Path Indicators			APAP		AKQ	RUNWAY 2	not available	not available			
Approach Path Indicators			APAP		AKQ	RUNWAY 20	not available	not available			
Approach Path Indicators			PAPI		AVC	RUNWAY 1	not available	not available			
Approach Path Indicators			PAPI		AVC	RUNWAY 19	not available	not available			
Approach Path Indicators			PAPI		BCB	RUNWAY 12	not available	not available			
Approach Path Indicators			PAPI		BCB	RUNWAY 30	not available	not available			
Approach Path Indicators			VASI		CHO	RUNWAY 21	not available	not available			
Approach Path Indicators			PAPI		CJR	RUNWAY 22	not available	not available			
Approach Path Indicators			PAPI		CJR	RUNWAY 4	not available	not available			
Approach Path Indicators			PAPI		CPK	RUNWAY 23	not available	not available			
Approach Path Indicators			PAPI		CPK	RUNWAY 5	not available	not available			

NAVAID Type	NAVAID name	NAVAID id	NAVAID Equipment	NAVAID Frequency	Associated Airport	Associated Runway	Date of Commissioning	Condition Assessment	Ownership	Model	NADIN
Approach Path Indicators			VASI		CXE	RUNWAY 18	not available	not available			
Approach Path Indicators			VASI		CXE	RUNWAY 36	not available	not available			
Approach Path Indicators			VASI		DAN	RUNWAY 13	not available	not available			
Approach Path Indicators			PAPI		DAN	RUNWAY 2	not available	not available			
Approach Path Indicators			PAPI		DAN	RUNWAY 20	not available	not available			
Approach Path Indicators			VASI		DAN	RUNWAY 31	not available	not available			
Approach Path Indicators			PAPI		EMV	RUNWAY 15	not available	not available			
Approach Path Indicators			PAPI		EMV	RUNWAY 33	not available	not available			
Approach Path Indicators			PVASI		EZF	RUNWAY 24	not available	not available			
Approach Path Indicators			PVASI		EZF	RUNWAY 6	not available	not available			
Approach Path Indicators			PAPI		FCI	RUNWAY 15	not available	not available			
Approach Path Indicators			PAPI		FCI	RUNWAY 33	not available	not available			
Approach Path Indicators			PAPI		FKN	RUNWAY 27	not available	not available			
Approach Path Indicators			PAPI		FKN	RUNWAY 9	not available	not available			
Approach Path Indicators			APAP		FRR	RUNWAY 27	not available	not available			
Approach Path Indicators			APAP		FRR	RUNWAY 9	not available	not available			
Approach Path Indicators			PAPI		FVX	RUNWAY 21	not available	not available			
Approach Path Indicators			PAPI		FVX	RUNWAY 3	not available	not available			
Approach Path Indicators			APAP		GDY	RUNWAY 22	not available	not available			
Approach Path Indicators			APAP		GDY	RUNWAY 4	not available	not available			
Approach Path Indicators			panels		GVE	RUNWAY 23	not available	not available			
Approach Path Indicators			panels		GVE	RUNWAY 5	not available	not available			
Approach Path Indicators			PAPI		HEF	RUNWAY 16L	not available	not available			
Approach Path Indicators			PAPI		HEF	RUNWAY 16R	not available	not available			
Approach Path Indicators			PAPI		HEF	RUNWAY 34L	not available	not available			
Approach Path Indicators			PAPI		HEF	RUNWAY 34R	not available	not available			
Approach Path Indicators			PAPI		HLX	RUNWAY 1	not available	not available			
Approach Path Indicators			PAPI		HLX	RUNWAY 19	not available	not available			
Approach Path Indicators			PAPI		HSP	RUNWAY 25	not available	not available			
Approach Path Indicators			PAPI		HSP	RUNWAY 7	not available	not available			
Approach Path Indicators			PAPI		HWY	RUNWAY 14	not available	not available			
Approach Path Indicators			PAPI		HWY	RUNWAY 32	not available	not available			
Approach Path Indicators			APAP		JGG	RUNWAY 13	not available	not available			
Approach Path Indicators			APAP		JGG	RUNWAY 31	not available	not available			
Approach Path Indicators			PAPI		JYO	RUNWAY 17	not available	not available			

NAVAID Type	NAVAID name	NAVAID id	NAVAID Equipment	NAVAID Frequency	Associated Airport	Associated Runway	Date of Commissioning	Condition Assessment	Ownership	Model	NADIN
Approach Path Indicators			PAPI		JYO	RUNWAY 35	not available	not available			
Approach Path Indicators			PAPI		LKU	RUNWAY 27	not available	not available			
Approach Path Indicators			PAPI		LKU	RUNWAY 9	not available	not available			
Approach Path Indicators			PAPI		LNP	RUNWAY 24	not available	not available			
Approach Path Indicators			PAPI		LNP	RUNWAY 6	not available	not available			
Approach Path Indicators			APAP		LVL	RUNWAY 18	not available	not available			
Approach Path Indicators			APAP		LVL	RUNWAY 36	not available	not available			
Approach Path Indicators			PAPI		LYH	RUNWAY 17	not available	not available			
Approach Path Indicators			VASI		LYH	RUNWAY 22	not available	not available			
Approach Path Indicators			PAPI		LYH	RUNWAY 35	not available	not available			
Approach Path Indicators			PAPI		LYH	RUNWAY 4	not available	not available			
Approach Path Indicators			PAPI		MFV	RUNWAY 21	not available	not available			
Approach Path Indicators			PAPI		MFV	RUNWAY 3	not available	not available			
Approach Path Indicators			PAPI		MKJ	RUNWAY 26	not available	not available			
Approach Path Indicators			PAPI		MKJ	RUNWAY 8	not available	not available			
Approach Path Indicators			PAPI		MTV	RUNWAY 12	not available	not available			
Approach Path Indicators			PAPI		MTV	RUNWAY 30	not available	not available			
Approach Path Indicators			PAPI		OFP	RUNWAY 16	not available	not available			
Approach Path Indicators			PAPI		OFP	RUNWAY 34	not available	not available			
Approach Path Indicators			PAPI		OKV	RUNWAY 14	not available	not available			
Approach Path Indicators			PAPI		OKV	RUNWAY 32	not available	not available			
Approach Path Indicators			PAPI		OMH	RUNWAY 26	not available	not available			
Approach Path Indicators			PAPI		OMH	RUNWAY 8	not available	not available			
Approach Path Indicators			PAPI		ORF	RUNWAY 14	not available	not available			
Approach Path Indicators			PAPI		ORF	RUNWAY 23R	not available	not available			
Approach Path Indicators			PAPI		ORF	RUNWAY 32	not available	not available			
Approach Path Indicators			PAPI		ORF	RUNWAY 5L	not available	not available			
Approach Path Indicators			VASI		PHF	RUNWAY 2	not available	not available			
Approach Path Indicators			VASI		PHF	RUNWAY 20	not available	not available			
Approach Path Indicators			VASI		PHF	RUNWAY 25L	not available	not available			
Approach Path Indicators			PAPI		PSK	RUNWAY 24	not available	not available			
Approach Path Indicators			PAPI		PTB	RUNWAY 23	not available	not available			
Approach Path Indicators			PAPI		PTB	RUNWAY 5	not available	not available			
Approach Path Indicators			APAP		PVG	RUNWAY 10	not available	not available			
Approach Path Indicators			APAP		PVG	RUNWAY 28	not available	not available			

NAVAID Type	NAVAID name	NAVAID id	NAVAID Equipment	NAVAID Frequency	Associated Airport	Associated Runway	Date of Commissioning	Condition Assessment	Ownership	Model	NADIN
Approach Path Indicators			VASI		RIC	RUNWAY 16L	not available	not available			
Approach Path Indicators			VASI		RIC	RUNWAY 2	not available	not available			
Approach Path Indicators			VASI		RIC	RUNWAY 20	not available	not available			
Approach Path Indicators			VASI		RIC	RUNWAY 25	not available	not available			
Approach Path Indicators			PAPI		RMN	RUNWAY 15	not available	not available			
Approach Path Indicators			PAPI		RMN	RUNWAY 33	not available	not available			
Approach Path Indicators			PAPI		ROA	RUNWAY 33	not available	not available			
Approach Path Indicators			VASI		ROA	RUNWAY 6	not available	not available			
Approach Path Indicators			PAPI		SFQ	RUNWAY 22	not available	not available			
Approach Path Indicators			PINL		SFQ	RUNWAY 25	not available	not available			
Approach Path Indicators			PAPI		SFQ	RUNWAY 4	not available	not available			
Approach Path Indicators			APAP		SFQ	RUNWAY 7	not available	not available			
Approach Path Indicators			PAPI		SHD	RUNWAY 23	not available	not available			
Approach Path Indicators			PAPI		SHD	RUNWAY 5	not available	not available			
Approach Path Indicators			APAP		VBW	RUNWAY 15	not available	not available			
Approach Path Indicators			APAP		VBW	RUNWAY 33	not available	not available			
Approach Path Indicators			PAPI		VJI	RUNWAY 24	not available	not available			
Approach Path Indicators			PAPI		VJI	RUNWAY 6	not available	not available			
Approach Path Indicators			TRIL		W24	RUNWAY 28	not available	not available			
Approach Path Indicators			APAP		W31	RUNWAY 2	not available	not available			
Approach Path Indicators			APAP		W31	RUNWAY 20	not available	not available			
Approach Path Indicators			APAP		W45	RUNWAY 22	not available	not available			
Approach Path Indicators			APAP		W45	RUNWAY 4	not available	not available			
Approach Path Indicators			APAP		W63	RUNWAY 4	not available	not available			
Approach Path Indicators			APAP		W75	RUNWAY 1	not available	not available			
Approach Path Indicators			APAP		W75	RUNWAY 19	not available	not available			
Approach Path Indicators			PAPI		W78	RUNWAY 1	not available	not available			
Approach Path Indicators			PAPI		W78	RUNWAY 19	not available	not available			
Approach Path Indicators			APAP		W81	RUNWAY 15	not available	not available			
Approach Path Indicators			APAP		W81	RUNWAY 33	not available	not available			
Approach Path Indicators			PAPI		W96	RUNWAY 10	not available	not available			
Approach Path Indicators			PAPI		W96	RUNWAY 28	not available	not available			
Approach Path Indicators			PAPI		XSA	RUNWAY 10	not available	not available			
Approach Path Indicators			PAPI		XSA	RUNWAY 28	not available	not available			

NAVAID Type	NAVAID name	NAVAID id	NAVAID Equipment	NAVAID Frequency	Associated Airport	Associated Runway	Date of Commissioning	Condition Assessment	Ownership	Model	NADIN
CTAF / Unicom				122.7	0V4						
CTAF / Unicom				122.9	0VG						
CTAF / Unicom				123.05	6V3						
CTAF / Unicom				122.9	7W4						
CTAF / Unicom				122.8	8W2						
CTAF / Unicom				122.8	AKQ						
CTAF / Unicom				122.8	AVC						
CTAF / Unicom				123.05	BCB						
CTAF / Unicom				122.95	BKT						
CTAF / Unicom				124.5	CHO						
CTAF / Unicom				123.075	CJR						
CTAF / Unicom				123.05	CPK						
CTAF / Unicom				122.9	CXE						
CTAF / Unicom				123.05	DAN						
CTAF / Unicom					DCA						
CTAF / Unicom				123.0	EMV						
CTAF / Unicom				122.8	EZF						
CTAF / Unicom				123.05	FCI						
CTAF / Unicom				122.8	FKN						
CTAF / Unicom				123.0	FRR						
CTAF / Unicom				123.0	FVX						
CTAF / Unicom				123.0	FYJ						
CTAF / Unicom				123.0	GDY						
CTAF / Unicom				123.0	GVE						
CTAF / Unicom				133.1	HEF						
CTAF / Unicom				122.8	HLX						
CTAF / Unicom				123.0	HSP						
CTAF / Unicom				122.7	HWY						
CTAF / Unicom					IAD						
CTAF / Unicom				122.8	JGG						
CTAF / Unicom				122.975	JYO						
CTAF / Unicom				122.725	LKU						
CTAF / Unicom				123.0	LNP						
CTAF / Unicom				122.8	LVL						
CTAF / Unicom				127.65	LYH						

NAVAID Type	NAVAID name	NAVAID id	NAVAID Equipment	NAVAID Frequency	Associated Airport	Associated Runway	Date of Commissioning	Condition Assessment	Ownership	Model	NADIN
CTAF / Unicom				122.8	MFV						
CTAF / Unicom				122.7	MKJ						
CTAF / Unicom				122.7	MTV						
CTAF / Unicom				122.7	OFP						
CTAF / Unicom				122.7	OKV						
CTAF / Unicom				122.8	OMH						
CTAF / Unicom				120.8	ORF						
CTAF / Unicom				118.7	PHF						
CTAF / Unicom				122.7	PSK						
CTAF / Unicom				122.7	PTB						
CTAF / Unicom				123.0	PVG						
CTAF / Unicom				121.1	RIC						
CTAF / Unicom				122.725	RMN						
CTAF / Unicom				118.3	ROA						
CTAF / Unicom				122.7	SFQ						
CTAF / Unicom				123.0	SHD						
CTAF / Unicom				122.8	TGI						
CTAF / Unicom				122.7	VBW						
CTAF / Unicom				122.8	VJI						
CTAF / Unicom				123.05	W13						
CTAF / Unicom				123.0	W24						
CTAF / Unicom				122.7	W31						
CTAF / Unicom				122.8	W45						
CTAF / Unicom				122.9	W63						
CTAF / Unicom				123.0	W75						
CTAF / Unicom				122.8	W78						
CTAF / Unicom				122.8	W81						
CTAF / Unicom				122.8	W90						
CTAF / Unicom				122.8	W91						
CTAF / Unicom				122.8	W96						
CTAF / Unicom				122.8	XSA						
Clearance Delivery			GCO		6V3						
Clearance Delivery			GCO		AVC						
Clearance Delivery			Direct / RTR		BCB						

NAVAID Type	NAVAID name	NAVAID id	NAVAID Equipment	NAVAID Frequency	Associated Airport	Associated Runway	Date of Commissioning	Condition Assessment	Ownership	Model	NADIN
Clearance Delivery			Direct / RTR		CHO						
Clearance Delivery			GCO		CJR						
Clearance Delivery			GCO		CPK						
Clearance Delivery			RTR		DAN						
Clearance Delivery			Direct		DCA						
Clearance Delivery			GCO (OTS indef)		EZF						
Clearance Delivery			RTR		FCI						
Clearance Delivery			GCO (unreliable)		FKN						
Clearance Delivery			GCO		FVX						
Clearance Delivery			Direct / RTR		HEF						
Clearance Delivery			GCO		HLX						
Clearance Delivery			Direct / RTR		HSP						
Clearance Delivery			GCO		HWY						
Clearance Delivery			Direct		IAD						
Clearance Delivery			GCO		JGG						
Clearance Delivery			Direct / RTR		JYO						
Clearance Delivery			Direct / RTR		LNP						
Clearance Delivery			Direct / RTR		LYH						
Clearance Delivery			GCO		MFV						
Clearance Delivery			RTR		MTV						
Clearance Delivery			Direct / RTR		OFP						
Clearance Delivery			Direct / RTR		OKV						
Clearance Delivery			Direct		ORF						
Clearance Delivery			Direct		PHF						
Clearance Delivery			RTR		PSK						
Clearance Delivery			GCO		PTB						
Clearance Delivery			Direct		RIC						
Clearance Delivery			GCO		RMN						
Clearance Delivery			Direct		ROA						
Clearance Delivery			GCO		SFQ						
Clearance Delivery			RTR		SHD						
Clearance Delivery			Direct / RTR		VJI						
Clearance Delivery			GCO		W96						
Weather Reporting			AWOS-III (under construction)	pending	0VG			New			Yes

NAVAID Type	NAVAID name	NAVAID id	NAVAID Equipment	NAVAID Frequency	Associated Airport	Associated Runway	Date of Commissioning	Condition Assessment	Ownership	Model	NADIN
Weather Reporting			AWOS-III	118.075	6V3			survey not completed			Yes
Weather Reporting			ASOS	128.325	AKQ			not available (FAA)			Yes
Weather Reporting			AWOS-III (PT)	127.525	AVC			Excellent			Yes
Weather Reporting			AWOS-III (PT)	133.325	BCB			Excellent			Yes
Weather Reporting			ASOS	118.425	CHO			not available (FAA)			Yes
Weather Reporting			AWOS-III (PT)	120.025	CJR			Excellent			Yes
Weather Reporting			AWOS-III (PT)	123.675	CPK			Excellent			Yes
Weather Reporting			ASOS	128.125	DAN			not available (FAA)			Yes
Weather Reporting			ASOS	132.65	DCA			not available (FAA)			Yes
Weather Reporting			AWOS-III (PT)	124.175	EMV			Excellent			Yes
Weather Reporting			AWOS-III	128.125	EZF			Good			Yes
Weather Reporting			AWOS-III	128.625	FCI			not available			No
Weather Reporting			AWOS-III	124.675	FKN			Fair			Yes
Weather Reporting			AWOS-III (P)	132.725	FVX			Excellent			Yes
Weather Reporting			AWOS-III (P)	132.825	FYJ			Excellent			Yes
Weather Reporting			AWOS-III	125.125	HEF			not available			Yes
Weather Reporting			AWOS-III	118.375	HLX			Excellent			Yes
Weather Reporting			AWOS-III	118.8	HSP			not available			Yes
Weather Reporting			AWOS-III	119.325	HWY			New			Yes
Weather Reporting			ASOS	134.85	IAD			not available (FAA)			Yes
Weather Reporting			AWOS-III	120.625	JGG			Good			Yes
Weather Reporting			AWOS-III (PT), unreliable	125.225	JYO			Excellent			Yes
Weather Reporting			AWOS-III (P)	119.475	LKU			Excellent			Yes
Weather Reporting			AWOS-III	118.6	LNP			not available			Yes
Weather Reporting			ASOS	119.8	LYH			not available (FAA)			Yes
Weather Reporting			AWOS-III (PT)	118.175	MFV			Excellent			Yes
Weather Reporting			AWOS-III	123.875	MKJ			survey not completed			Yes
Weather Reporting			AWOS-III (P)	118.45	MTV			Excellent			Yes
Weather Reporting			ASOS	119.025	OFP			not available (FAA)			Yes
Weather Reporting			AWOS-III (PT)	124.85	OKV			Excellent			Yes
Weather Reporting			AWOS-III	118.075	OMH			Excellent			Yes
Weather Reporting			ASOS	127.15	ORF			not available (FAA)			Yes
Weather Reporting			ASOS	128.65	PHF			not available (FAA)			Yes

NAVAID Type	NAVAID name	NAVAID id	NAVAID Equipment	NAVAID Frequency	Associated Airport	Associated Runway	Date of Commissioning	Condition Assessment	Ownership	Model	NADIN
Weather Reporting			AWOS-III (PT)	127.375	PSK			Excellent			Yes
Weather Reporting			AWOS-III (PT)	133.325	PTB			Excellent			Yes
Weather Reporting			AWOS-III	118.375	PVG			not available			No
Weather Reporting			ASOS	119.15	RIC			not available (FAA)			Yes
Weather Reporting			AWOS-III (PT)	126.325	RMN			not available			Yes
Weather Reporting			ASOS	134.95	ROA			Excellent			Yes
Weather Reporting			AWOS-III (PT)	119.375	SFQ			Excellent			Yes
Weather Reporting			AWOS-III (PT)	124.925	SHD			Excellent			Yes
Weather Reporting			AWOS-III	128.125	VJI			not available			Yes
Weather Reporting			AWOS-III (P)	125.775	XSA			New			Yes

source: Consultant's Records

Table C-2 – Survey Monuments

ID	Name	Latitude	Longitude	Height (ft)	Type
0V4	AA9293	37°08'30.96339"N	79°00'55.17157"W	592.9	PACS
0V4	GW2396	37°08'24.17825"N	79°01'07.67004"W	594.8	SACS
0V4	GW2397	37°08'40.99451"N	79°00'39.60290"W	586.3	SACS
6V3	2000	37°03'47.09970"N	81°47'54.75137"W	2549.249	TACS
6V3	2001	37°03'39.64530"N	81°48'18.79879"W	2546.557	TACS
6V3	2002	37°03'56.27283"N	81°47'30.35974"W	2549.310	TACS
6V3	2003	37°03'58.83406"N	81°47'26.01575"W	2554.613	TACS
AVC	AA9300	36°41'21.62990"N	78°03'11.45769"W	413.4	PACS
AVC	AA9301	36°41'42.30935"N	78°03'15.64474"W	438.8	SACS
AVC	AA9302	36°40'53.12383"N	78°03'13.15948"W	375.4	SACS
BCB	AI2793	37°12'42.48910"N	80°24'57.54979"W	2122.2	PACS
BCB	AI2794	37°12'22.42708"N	80°24'10.14337"W	2118.7	SACS
BCB	GX3472	37°12'34.42316"N	80°24'38.90839"W	2098.8	SACS
CHO	HW3671	38°07'43.10101"N	78°27'32.95916"W	642.4	PACS
CHO	AA9190	38°08'46.94046"N	78°26'57.36483"W	616.7	SACS
CHO	AA9191	38°07'51.98764"N	78°27'25.66890"W	637.2	SACS
CHO	AH4620	38°07'53.89377"N	78°27'17.17091"W	631.4	SACS
CHO	AH4621	38°08'41.26151"N	78°26'54.57975"W	611.9	SACS
DAN	AH8544	36°34'12.62953"N	79°20'14.27198"W	577.3	PACS
DAN	FY0776	36°34'29.58339"N	79°20'08.44753"W	561.94	SACS
DAN	AH8551	36°34'47.59485"N	79°20'04.11326"W	554.8	SACS
FCI	AA9197	37°23'50.83970"N	77°31'00.74987"W	199.6	PACS
FCI	AA9198	37°24'13.88183"N	77°31'10.68349"W	207.2	SACS
FCI	AA9199	37°24'45.19438"N	77°31'43.48339"W	245.1	SACS
FVX	2002	37°21'02.74695"N	78°26'24.93366"W	315.976	TACS
FVX	2001	37°21'48.48244"N	78°26'03.42303"W	311.577	TACS
HEF	HV9241	38°43'40.13007"N	77°31'12.19854"W	188.5	PACS
HEF	HV9242	38°43'25.24565"N	77°30'50.59754"W	174.8	SACS
HEF	HV9243	38°43'01.79752"N	77°30'37.92250"W	172.9	SACS
HSP	AA9291	37°57'08.48352"N	79°50'15.49692"W	3784.9	PACS
HSP	AA9289	37°56'50.88515"N	79°50'28.35015"W	3788.6	SACS
HSP	AA9290	37°57'15.25636"N	79°49'36.35098"W	3763.6	SACS
JYO	DE9220	39°05'05.58527"N	77°33'35.73980"W	374.7	PACS
JYO	JV6141	39°04'51.93701"N	77°33'30.18572"W	374.8	SACS
JYO	JV6140	39°04'31.61251"N	77°33'21.38302"W	385.5	SACS
LKU	UA0023	38°00'35.25527"N	77°58'24.21345"W	475.0	PACS
LKU	AA9201	38°00'38.85961"N	77°57'53.49016"W	488.0	SACS
LKU	AA9200	38°00'34.10000"N	77°58'38.35121"W	467.2	SACS
LNP	AI3890	36°59'08.60337"N	82°31'50.78750"W	2678.3	PACS
LNP	GA3638	36°58'59.30630"N	82°32'14.86337"W	2667.3	SACS
LNP	GA3635	36°59'23.22011"N	82°31'31.08931"W	2673.7	SACS
LYH	GW1152	37°19'49.59328"N	79°12'08.23394"W	956.66	PACS
LYH	GW1153	37°19'42.84399"N	79°12'08.70765"W	963.45	SACS
MFV	FW1693	37°38'29.68427"N	75°45'52.09479"W	44.6	SACS

ID	Name	Latitude	Longitude	Height (ft)	Type
MFV	AA9315	37°39'12.28773"N	75°45'29.91412"W	45.1	SACS
MKJ	AI2426	36°53'35.22430"N	81°21'08.39235"W	2564.3	PACS
MKJ	AI2427	36°53'32.50711"N	81°21'25.24988"W	2569.8	SACS
MKJ	FZ2206	36°53'44.66658"N	81°20'36.17308"W	2493.7	SACS
MTV	AI4250	36°38'09.91833"N	80°01'40.54010"W	960.7	PACS
MTV	FZ2201	36°37'41.58657"N	80°00'39.17153"W	910.0	SACS
MTV	FZ2198	36°37'53.55737"N	80°01'08.66056"W	921.6	SACS
OKV	2001	39°08'40.35435"N	78°08'52.70582"W	613.101	TACS
OKV	2002	39°08'15.65142"N	78°08'16.88233"W	585.236	TACS
OKV	2003	39°08'54.34692"N	78°09'07.82761"W	610.872	TACS
ORF	AA9303	36°53'42.33601"N	76°12'03.04531"W	21.6	PACS
ORF	AA9304	36°53'24.43529"N	76°12'18.98769"W	20.2	SACS
ORF	FX5366	36°53'59.95929"N	76°11'38.43972"W	21.0	SACS
PHF	GV4185	37°07'47.50724"N	76°29'44.66153"W	35.9	PACS
PHF	AA9305	37°08'25.60119"N	76°29'38.70166"W	37.3	SACS
PHF	AA9306	37°08'06.48243"N	76°28'47.05298"W	34.5	SACS
RIC	AE2426	37°30'37.11154"N	77°19'23.82173"W	162.3	PACS
RIC	AA9298	37°30'16.21910"N	77°19'09.51139"W	156.4	PACS
RIC	GV6176	37°31'01.63115"N	77°19'23.69830"W	164.4	SACS
RIC	GV6175	37°29'44.88233"N	77°18'22.22873"W	157.2	SACS
RMN	DG4048	38°23'51.18514"N	77°27'22.76653"W	183.9	PACS
RMN	DG4049	38°23'28.89548"N	77°27'00.16994"W	169.6	SACS
RMN	DG4050	38°24'19.92359"N	77°27'38.72672"W	214.6	SACS
ROA	AA9207	37°19'33.76818"N	79°58'46.60799"W	1169.6	PACS
ROA	AA9208	37°19'43.24085"N	79°58'53.82189"W	1162.2	SACS
ROA	AA9209	37°18'54.39445"N	79°58'16.21177"W	1138.9	SACS
SHD	AA9193	38°15'49.29691"N	78°53'45.30717"W	1180.0	PACS
SHD	AA9192	38°16'12.22285"N	78°53'22.41001"W	1196.6	SACS
SHD	HW1114	38°15'25.61117"N	78°54'08.94902"W	1170.66	SACS
TGI	AE3592	37°49'09.49337"N	75°59'54.65044"W	4.2	PACS
TGI	FW1702	37°49'45.99159"N	75°59'50.03574"W	4.3	SACS
TGI	FW1705	37°49'28.36069"N	75°59'51.58482"W	3.7	SACS
VJI	AI3889	36°41'26.02183"N	82°01'50.26393"W	2097.8	PACS
VJI	GA3629	36°40'58.51535"N	82°02'23.61927"W	2056.5	SACS
VJI	GA3626	36°41'16.62737"N	82°01'49.95649"W	2063.0	SACS
W91	AA9194	37°06'37.76098"N	79°35'23.48359"W	893.2	PACS
W91	AA9195	37°06'29.44681"N	79°35'29.83807"W	880.0	SACS
W91	AA9196	37°06'17.68924"N	79°35'46.42826"W	853.4	SACS
WAL	FW2004	37°56'14.25583"N	75°27'55.99104"W	33.4	PACS
WAL	FW1701	37°56'35.83500"N	75°28'44.16153"W	34.6	SACS
WAL	FW1694	37°56'35.62716"N	75°28'01.71779"W	36.9	SACS
XSA	DK6226	37°51'37.23167"N	76°53'39.64024"W	121.8	PACS
XSA	DK6227	37°51'38.41420"N	76°53'13.33481"W	123.6	SACS
XSA	DK6228	37°51'35.49312"N	76°54'04.48974"W	130.6	SACS

source: http://www.ngs.noaa.gov/cgi-bin/airports.prl?TYPE=PACSAC

Appendix D - WEATHER DATA

Ceiling vs. visibility curves for each of the 39 reporting stations in Virginia were generated. These charts can be used to estimate how much additional time an airport would be available for use based on reduction in instrument approach minima.

This weather data report is split in three parts: review of available data, ceiling vs. visibility charts, and observation timestamps charts. As no data mining operation ever produces error free records, information is also provided about the data. Specifically, a set of graphics is provided that summarizes the available data. A third set of charts displays all the timestamps of all the observations over 10 years for all the 39 reporting stations.

Data Collection

Data was collected from the National Climatic Data Center (NCDC) for 10 years for each of the 39 reporting stations from 1/1/1998 to 12/31/2007. The database used is from the Integrated Surface Hourly Global Database (DS 3505). (http://www.ncdc.noaa.gov/oa/mpp/).

Chesterfield (FCI), Warrenton (HWY), and Hampton Roads (PVG) airports have AWOS weather observations stations but their results are not captured in the NCDC.

Data Issues

AWOS data before 2002: The data before 2002 appears to be less reliable from a reporting standpoint. AWOS systems are supposed to report data every 20 minutes. However, the reporting frequency before 2002 is less in many cases (see observation timestamp charts at the end of this document).

Wakefield (AKQ): Data from 2004, 2005 and 2006 is missing for this station. We contacted NCDC and they confirmed that the data is missing and that it cannot be recovered.

The NCDC has no data for stations Richlands (6V3), Emporia (EMV), West Point (FYJ), Williamsburg (JGG), Orange (OMH) and Stafford (RMN) before May 2004 and reports May 2004 as the starting date for observations from these locations.

The NCDC has no data for stations Culpeper (CJR), Louisa (LKU), Hanover (OFP) and Suffolk (SFQ) before January 1999 and reports January 1999 as the starting date for observations from these locations.

The NCDC has no data for stations Chesapeake (CPK) before August 2001 and reports August 2001 as the starting date for observations from these locations.

An overview of the missing data is shown in Figures D-1, D-2, D-3 and D-4.

The timestamps for the weather observations available are shown in the last section of this document.

AWOS vs. ASOS reporting

AWOS stations are designed to report observations every 20 minutes. ASOS stations are designed to report observations every hour and report special observations (SPECIs) when defined weather changes are detected during that hour.

The AWOS station at Manassas (HEF) is reporting like an ASOS.

Observation Time Weight

The time weight for each observation is the time difference between the current observation and the next one. Since some observations do not occur exactly on the hour (or 20 or 40 minutes past the hour), we assigned a maximum allowable observation time between observations of 70 minutes. When the time difference between records exceeds 70 minutes, the time in excess of 70 minutes is treated as having no observation. As can be seen from most reporting stations, this results in only a small percentage of time for which no observation was recorded.

Figure D-1 – Data Availability by Station (green = available; white = not available)

Sation_ID	Station_Name	Y1998	Y1999	Y2000	Y2001	Y2002	Y2003	Y2004	Y2005	Y2006	Y2007
K6V3	Richland										
KAKQ	Wakefield										
KAVC	South Hill										
KBCB	Blacksburg										
KCHO	Charlottesville										
KCJR	Culpeper										
KCPK	Norfolk										
KDAN	Danville										
KDCA	Washington										
KEMV	Emporia										
KEZF	Fredericksburg										
KFKN	Franklin										
KFVX	Farmville										
KFYJ	West Point										
KHEF	Manassas										
KHLX	Galax Hillsville										
KHSP	Hot Springs										
KIAD	Washington										
KJGG	Williamsburg										
KJYO	Leesburg										
KLKU	Louisa										
KLNP	Wise										
KLYH	Lynchburg										
KMFV	Melfa										
KMKJ	Marion/Wytheville										
KMTV	Martinsville										
KOFP	Richmond/Ashland										
KOKV	Winchester										
KOMH	Orange										
KORF	Norfolk										
KPHF	Newport News										
KPSK	Dublin										
KPTB	Petersburg										
KRIC	Richmond										
KRMN	Stafford										
KROA	Roanoke										
KSFQ	Suffolk										
KSHD	Shenandoah										
KVJI	Abingdon										

source: Virginia Tech analysis

Figure D-2 – Overview of Available and Missing Data

Sation_ID	Station_Name	USAF_Code	AWOS_ASOS	Elevation_ft	Start Date	End Date	Number of Records	Total Years	Years of Observations	Observation Time Missing (%)
K6V3	Richland	720264	AWOS-3 - AUTO	2652	May-04	Dec-07	82,591	3.6	3.3	8.2
KAKQ	Wakefield	724019	ASOS - AUTO	113	Jan-98	Dec-07	65,510	10.0	6.9	30.9
KAVC	South Hill	724118	AWOS-3 - AUTO	442	Jan-98	Dec-07	175,248	10.0	9.4	5.7
KBCB	Blacksburg	724113	AWOS-3 - AUTO	2132	Jan-98	Dec-07	184,569	10.0	9.8	2.3
KCHO	Charlottesville	724016	ASOS - MANUAL/AUTO	639	Jan-98	Dec-07	101,879	10.0	9.5	4.5
KCJR	Culpeper	723098	AWOS-3 - AUTO	313	Jan-98	Dec-07	173,925	9.0	8.7	3.3
KCPK	Norfolk	724006	AWOS-3 - AUTO	20	Aug-01	Dec-07	150,646	6.4	6.2	2.3
KDAN	Danville	724106	ASOS - AUTO	571	Jan-98	Dec-07	96,616	10.0	9.6	3.6
KDCA	Washington	724050	ASOS - MANUAL/AUTO	15	Jan-98	Dec-07	120,227	10.0	10.0	0.2
KEMV	Emporia	720278	AWOS-3 -AUTO	127	May-04	Dec-07	92,005	3.6	3.5	1.5
KEZF	Fredericksburg	724033	AWOS-3 - AUTO	85	Jan-98	Dec-07	184,221	10.0	9.7	2.8
KFKN	Franklin	723083	AWOS-3 - AUTO	41	Jan-98	Dec-07	183,593	10.0	9.7	3
KFVX	Farmville	724017	AWOS-3 - AUTO	417	Jan-98	Dec-07	184,240	10.0	9.7	2.8
KFYJ	West Point	720285	AWOS-3 - ATUTO	24	Jan-98	Dec-07	78,106	3.6	3.5	2.2
KHEF	Manassas	724036	AWOS-3 - MANUAL/AUTO	192	Jan-98	Dec-07	118,897	10.0	9.5	4.9
KHLX	Galax Hillsville	724107	AWOS-3 - AUTO	2693	Jan-98	Dec-07	184,100	10.0	9.7	2.8
KHSP	Hot Springs	724115	AWOS-3 - AUTO	3792	Jan-98	Dec-07	184,927	10.0	9.8	2.3
KIAD	Washington	724030	ASOS - MANUAL/AUTO	313	Jan-98	Dec-07	115,540	10.0	10.0	0.3
KJGG	Williamsburg	720297	AWOS-3 - AUTO	49	May-04	Dec-07	92,018	3.6	3.6	1.2
KJYO	Leesburg	724055	AWOS-3 - AUTO	389	Jan-98	Dec-07	183,498	10.0	9.7	3.2
KLKU	Louisa	723114	AWOS-3 - AUTO	493	Jan-99	Dec-07	171,230	9.0	8.4	6.1
KLNP	Wise	724117	AWOS-3 - AUTO	2684	Jan-98	Dec-07	177,639	10.0	9.3	6.6
KLYH	Lynchburg	724100	ASOS - MANUAL/AUTO	938	Jan-98	Dec-07	113,635	10.0	9.9	0.5
KMFV	Melfa	724026	AWOS-3 - AUTO	47	Jan-98	Dec-07	183,450	10.0	9.7	3.2
KMKJ	Marion/Wytheville	724056	AWOS-3 AUTO	2559	Jan-98	Dec-07	183,066	10.0	9.6	3.6
KMTV	Martinsville	745985	AWOS-3 - AUTO	941	Jan-98	Dec-07	183,406	10.0	9.7	3.2
KOFP	Richmond/Ashland	723084	ASOS - AUTO	205	Jan-98	Dec-07	90,307	9.0	8.6	3.9
KOKV	Winchester	724053	AWOS-3 - AUTO	727	Jan-98	Dec-07	183,255	10.0	9.6	4.1
KOMH	Orange	722167	AWOS-3 - AUTO	465	Jan-98	Dec-07	93,056	3.6	3.6	1
KORF	Norfolk	723080	ASOS - MANUAL	26	Jan-98	Dec-07	119,761	10.0	10.0	0.2
KPHF	Newport News	723086	ASOS - MANUAL/AUTO	43	Jan-98	Dec-07	102,799	10.0	9.7	3.2
KPSK	Dublin	724116	AWOS-3 AUTO	2105	Jan-98	Dec-07	183,757	10.0	9.7	3
KPTB	Petersburg	724014	AWOS-3 AUTO	193	Jan-98	Dec-07	181,794	10.0	9.5	4.6
KRIC	Richmond	724010	ASOS - MANUAL	167	Jan-98	Dec-07	115,118	10.0	10.0	0.3
KRMN	Stafford	720317	AWOS-3 AUTO	211	May-04	Dec-07	92,053	3.6	3.5	1.4
KROA	Roanoke	724110	ASOS - MANUAL	1176	Jan-98	Dec-07	111,510	10.0	10.0	0.3
KSFQ	Suffolk	724007	AWOS-3 - AUTO	72	Jan-99	Dec-07	167,777	9.0	8.4	5.9
KSHD	Shenandoah	724105	AWOS-3 AUTO	1201	Jan-98	Dec-07	184,354	10.0	9.7	2.5
KVJI	Abingdon	724058	AWOS-3 - AUTO	2087	Jan-98	Dec-07	183,038	10.0	9.7	3.1

source: Virginia Tech analysis

Figure D-3 – Number of Records for Each Station Per Year

Sation_ID	Station_Name	Y1998	Y1999	Y2000	Y2001	Y2002	Y2003	Y2004	Y2005	Y2006	Y2007
K6V3	Richland	0	0	0	0	0	0	13,777	25,500	21,229	22,085
KAKQ	Wakefield	8,303	8,077	8,598	8,482	8,917	9,835	595	0	1,758	10,945
KAVC	South Hill	8,524	8,731	8,679	8,504	19,036	21,229	25,210	24,411	25,664	25,260
KBCB	Blacksburg	8,530	8,608	8,712	8,740	20,996	25,800	25,847	25,871	25,928	25,537
KCHO	Charlottesville	6,327	10,002	10,370	10,181	10,192	11,317	11,334	11,134	10,535	10,487
KCJR	Culpeper	0	7,340	8,663	8,721	21,130	25,725	25,635	25,790	25,804	25,117
KCPK	Norfolk	0	0	0	3,258	21,068	25,131	25,352	25,417	25,440	24,980
KDAN	Danville	8,520	8,669	8,721	8,535	8,850	10,056	11,811	11,111	10,789	9,554
KDCA	Washington	10,597	11,235	11,998	11,747	10,756	10,754	13,280	13,662	13,151	13,047
KEMV	Emporia	0	0	0	0	0	0	15,564	25,214	25,891	25,336
KEZF	Fredericksburg	8,600	8,836	8,553	8,611	21,176	25,490	25,722	25,897	25,872	25,464
KFKN	Franklin	8,595	8,659	8,619	8,667	21,214	25,593	25,613	25,781	25,909	24,943
KFVX	Farmville	8,470	8,976	8,621	8,694	20,976	25,332	25,780	25,868	25,943	25,580
KFYJ	West Point	0	0	0	0	0	0	15,392	22,750	20,613	19,351
KHEF	Manassas	8,461	12,422	11,945	10,936	9,998	11,468	13,576	14,369	13,307	12,415
KHLX	Galax Hillsville	8,419	9,006	8,491	8,726	20,731	25,668	25,858	25,888	25,810	25,503
KHSP	Hot Springs	8,542	8,827	8,713	8,677	21,184	25,788	25,871	25,904	25,911	25,510
KIAD	Washington	10,167	10,884	11,862	11,795	11,044	11,719	12,654	12,225	11,720	11,470
KJGG	Williamsburg	0	0	0	0	0	0	15,570	25,908	25,494	25,046
KJYO	Leesburg	8,561	8,803	8,529	8,744	20,958	25,866	24,880	25,818	25,865	25,474
KLKU	Louisa	0	6,780	8,125	7,843	20,636	25,688	25,829	25,524	25,964	24,841
KLNP	Wise	8,331	8,707	7,085	8,476	20,857	25,717	21,298	25,765	25,897	25,506
KLYH	Lynchburg	10,352	10,228	10,233	10,407	10,365	12,134	13,102	13,173	12,143	11,498
KMFV	Melfa	8,555	8,233	8,710	8,727	21,121	25,628	25,842	25,695	25,874	25,065
KMKJ	Marion/Wytheville	8,562	7,961	8,719	8,721	20,964	25,781	25,507	25,407	25,947	25,497
KMTV	Martinsville	8,546	8,658	8,619	8,661	20,786	25,043	25,828	25,876	25,903	25,486
KOFP	Richmond/Ashland	0	7,186	8,621	8,617	8,965	10,525	12,720	11,674	11,390	10,609
KOKV	Winchester	8,561	8,916	7,359	8,644	20,988	25,726	25,828	25,889	25,837	25,507
KOMH	Orange	0	0	0	0	0	0	15,753	25,903	25,897	25,503
KORF	Norfolk	10,141	10,812	11,775	11,524	11,477	12,045	12,775	13,043	13,276	12,893
KPHF	Newport News	8,637	8,749	8,957	10,813	10,683	10,881	11,513	10,873	11,073	10,620
KPSK	Dublin	8,500	8,864	8,673	8,675	20,785	25,762	25,270	25,820	25,903	25,505
KPTB	Petersburg	8,426	8,753	7,341	8,612	21,065	24,921	25,716	25,739	25,948	25,273
KRIC	Richmond	10,658	10,851	11,699	11,431	11,411	12,422	12,310	11,871	11,328	11,137
KRMN	Stafford	0	0	0	0	0	0	15,477	25,901	25,895	24,780
KROA	Roanoke	10,362	10,568	11,368	11,087	11,499	12,200	11,500	11,392	10,794	10,740
KSFQ	Suffolk	0	7,292	8,631	8,667	20,758	25,127	23,555	25,820	24,344	23,583
KSHD	Shenandoah	8,562	8,858	8,695	8,725	21,166	25,704	25,808	25,813	25,784	25,239
KVJI	Abingdon	8,572	8,771	8,714	8,720	20,759	25,713	25,776	24,584	25,918	25,511

source: Virginia Tech analysis

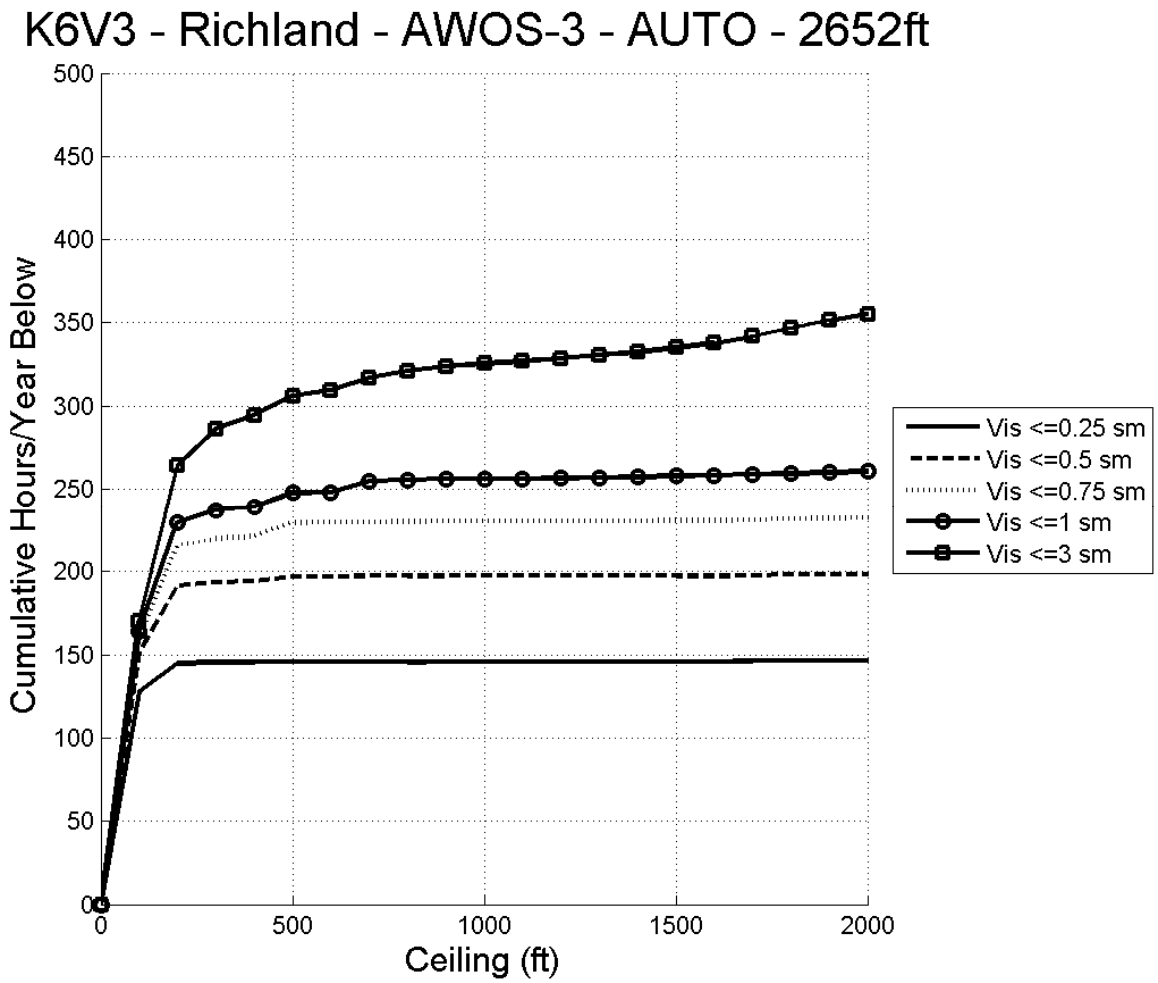
Figure D-4 – Amount of Time in % that Data is Missing for Each Station Per Year

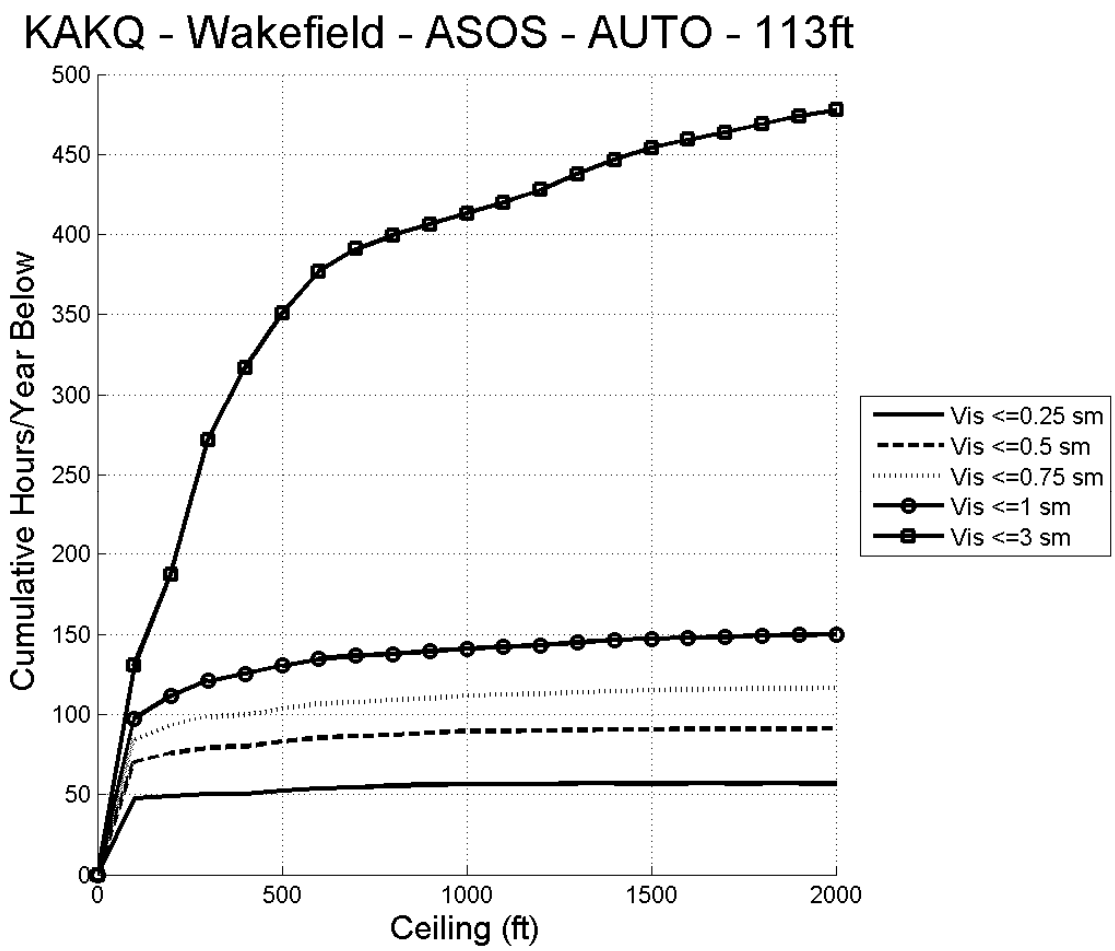
Sation_ID	Station_Name	Y1998	Y1999	Y2000	Y2001	Y2002	Y2003	Y2004	Y2005	Y2006	Y2007
K6V3	Richland	100.0	100.0	100.0	100.0	100.0	100.0	44.7	0.5	13.7	10.4
KAKQ	Wakefield	5.0	7.7	1.8	3.7	3.2	5.1	94.4	100.0	85.6	2.7
KAVC	South Hill	9.8	7.8	1.6	3.7	9.4	14.9	1.6	5.7	1.6	1.4
KBCB	Blacksburg	9.3	7.4	1.1	0.9	1.0	0.6	0.3	0.4	0.7	1.4
KCHO	Charlottesville	29.3	2.0	1.9	1.2	1.8	2.1	1.5	1.0	1.8	3.1
KCJR	Culpeper	100.0	21.5	2.5	1.3	1.1	0.9	1.2	0.6	1.1	3.0
KCPK	Norfolk	100.0	100.0	100.0	63.1	1.6	2.6	1.2	1.5	2.4	3.3
KDAN	Danville	6.6	5.0	3.1	3.3	2.3	5.1	0.8	0.1	2.0	8.0
KDCA	Washington	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.1	0.8	1.6
KEMV	Emporia	100.0	100.0	100.0	100.0	100.0	100.0	40.0	2.8	0.7	2.0
KEZF	Fredericksburg	9.1	7.3	3.3	2.5	1.4	1.6	0.8	0.3	0.9	1.8
KFKN	Franklin	8.4	9.9	2.1	1.8	1.0	1.3	1.3	0.6	0.7	3.8
KFVX	Farmville	10.2	6.1	2.4	1.5	3.1	2.4	0.6	0.4	0.7	1.3
KFYJ	West Point	100.0	100.0	100.0	100.0	100.0	100.0	40.0	2.8	1.6	3.4
KHEF	Manassas	11.0	5.1	1.6	2.7	2.9	6.6	9.3	3.0	3.4	3.9
KHLX	Galax Hillsville	11.8	6.7	3.7	1.3	1.2	1.0	0.3	0.3	0.9	1.4
KHSP	Hot Springs	9.7	6.5	1.0	1.8	1.1	0.7	0.3	0.3	0.7	1.3
KIAD	Washington	0.1	0.1	0.0	0.2	0.1	0.1	0.0	0.1	0.8	1.9
KJGG	Williamsburg	100.0	100.0	100.0	100.0	100.0	100.0	39.9	0.3	1.9	2.1
KJYO	Leesburg	9.8	7.2	4.3	1.7	1.7	0.7	3.9	0.4	0.8	1.4
KLKU	Louisa	100.0	28.6	7.8	11.5	2.8	0.9	0.4	1.8	0.7	4.1
KLNP	Wise	11.4	7.6	19.4	4.1	3.9	1.0	16.1	0.7	0.7	1.4
KLYH	Lynchburg	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.1	2.8	2.5
KMFV	Melfa	9.9	12.6	1.3	1.1	1.0	1.1	0.3	1.1	1.0	3.2
KMKJ	Marion/Wytheville	9.1	15.5	2.5	1.5	1.3	0.7	1.6	2.1	0.7	1.4
KMTV	Martinsville	9.0	8.2	3.9	2.7	2.1	3.4	0.4	0.5	0.8	1.4
KOFP	Richmond/Ashland	100.0	18.1	1.6	2.0	2.0	3.2	1.3	1.3	2.7	6.3
KOKV	Winchester	9.8	6.7	17.5	2.1	1.6	0.9	0.3	0.3	1.0	1.4
KOMH	Orange	100.0	100.0	100.0	100.0	100.0	100.0	39.2	0.3	0.7	1.1
KORF	Norfolk	0.1	0.1	0.0	0.1	0.1	0.2	0.0	0.1	0.8	1.8
KPHF	Newport News	6.1	5.5	3.6	0.4	2.3	5.0	1.4	3.0	2.2	2.4
KPSK	Dublin	10.3	6.8	3.1	2.7	1.2	0.7	2.3	0.8	0.8	1.4
KPTB	Petersburg	10.2	6.9	18.3	2.5	1.1	2.7	0.7	0.8	0.7	2.0
KRIC	Richmond	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.1	1.1	2.4
KRMN	Stafford	100.0	100.0	100.0	100.0	100.0	100.0	40.1	0.3	0.7	4.1
KROA	Roanoke	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.1	1.0	2.3
KSFQ	Suffolk	100.0	22.0	2.9	1.9	2.3	3.1	8.8	0.5	6.7	8.7
KSHD	Shenandoah	9.3	6.4	2.4	1.5	1.3	1.0	0.4	0.6	0.8	1.6
KVJI	Abingdon	9.2	6.9	2.7	1.6	2.1	0.8	0.6	5.3	0.7	1.4

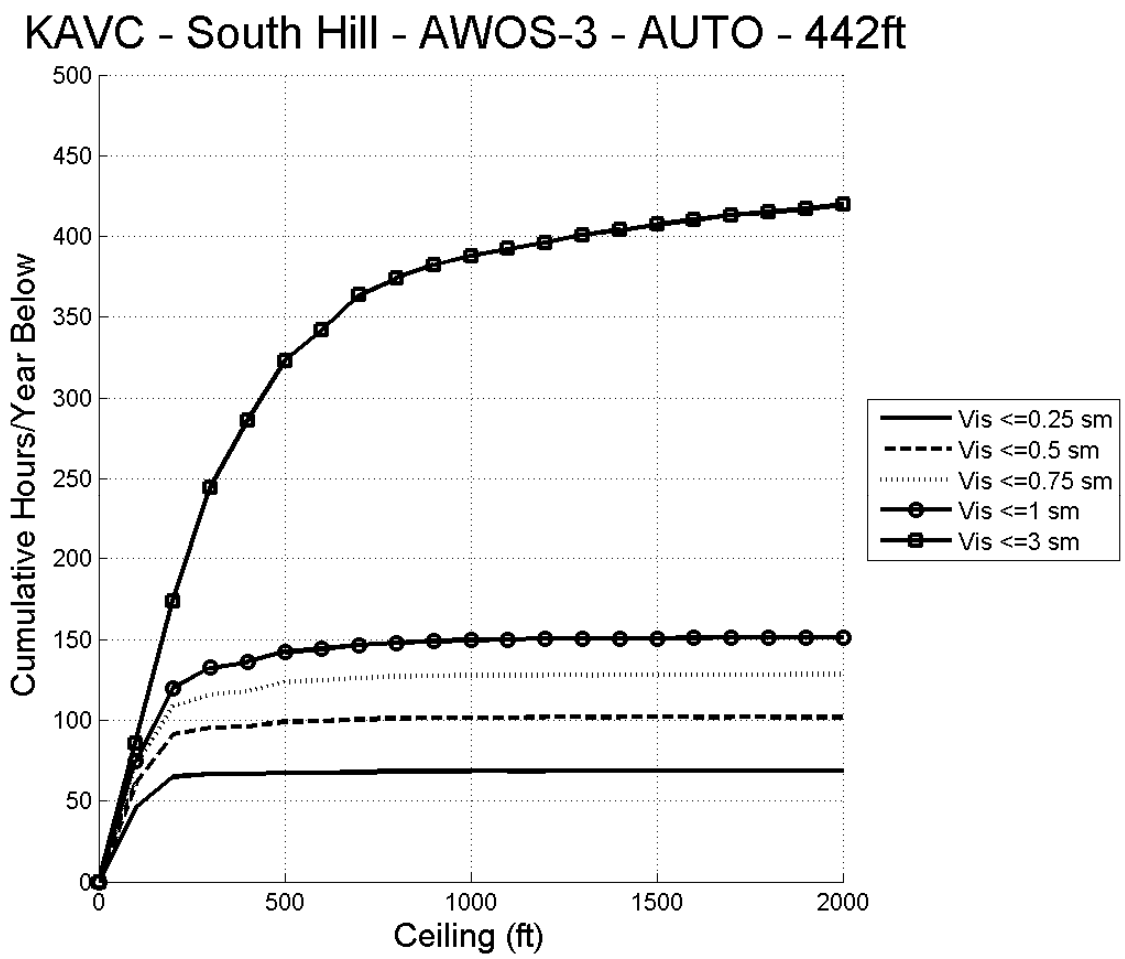
source: Virginia Tech analysis

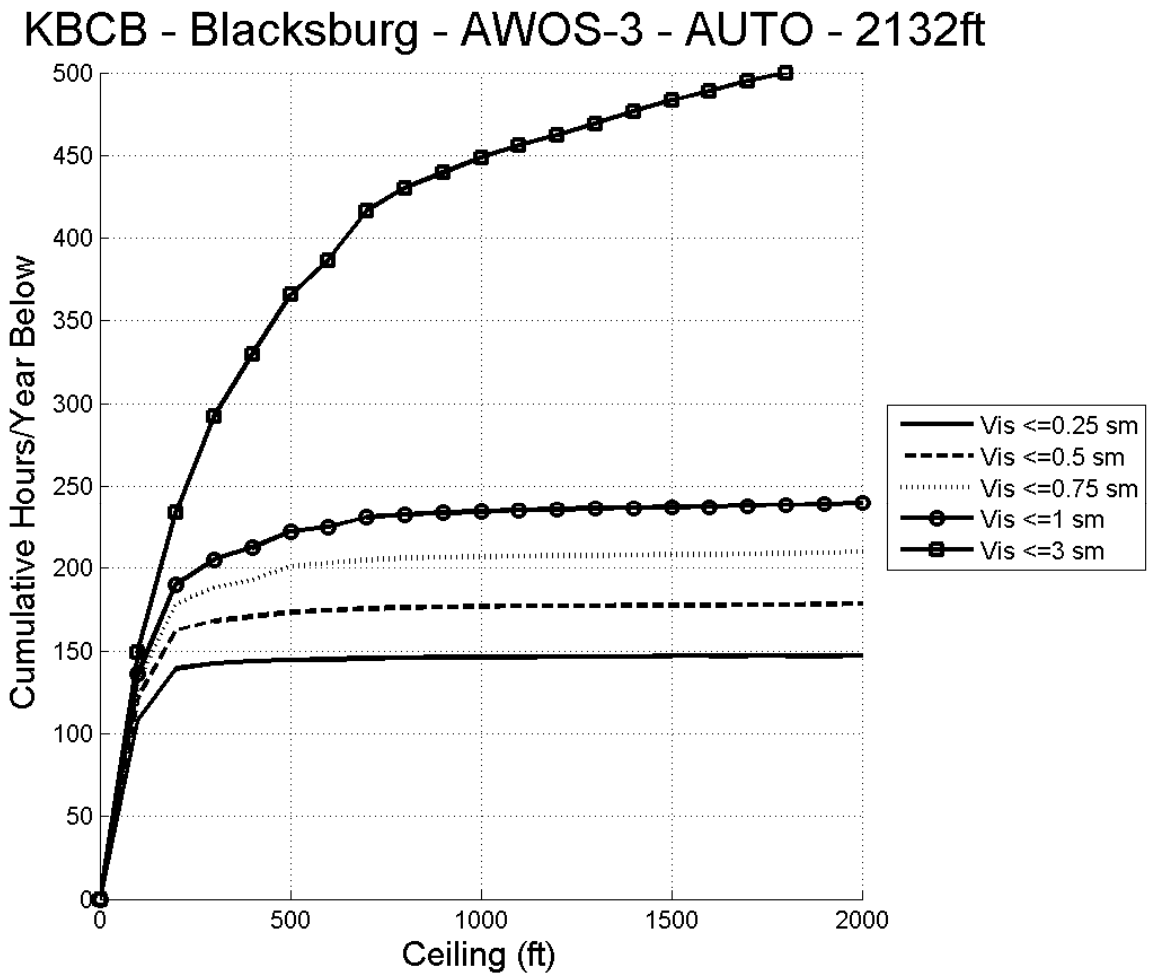
Ceiling vs. Visibility Charts

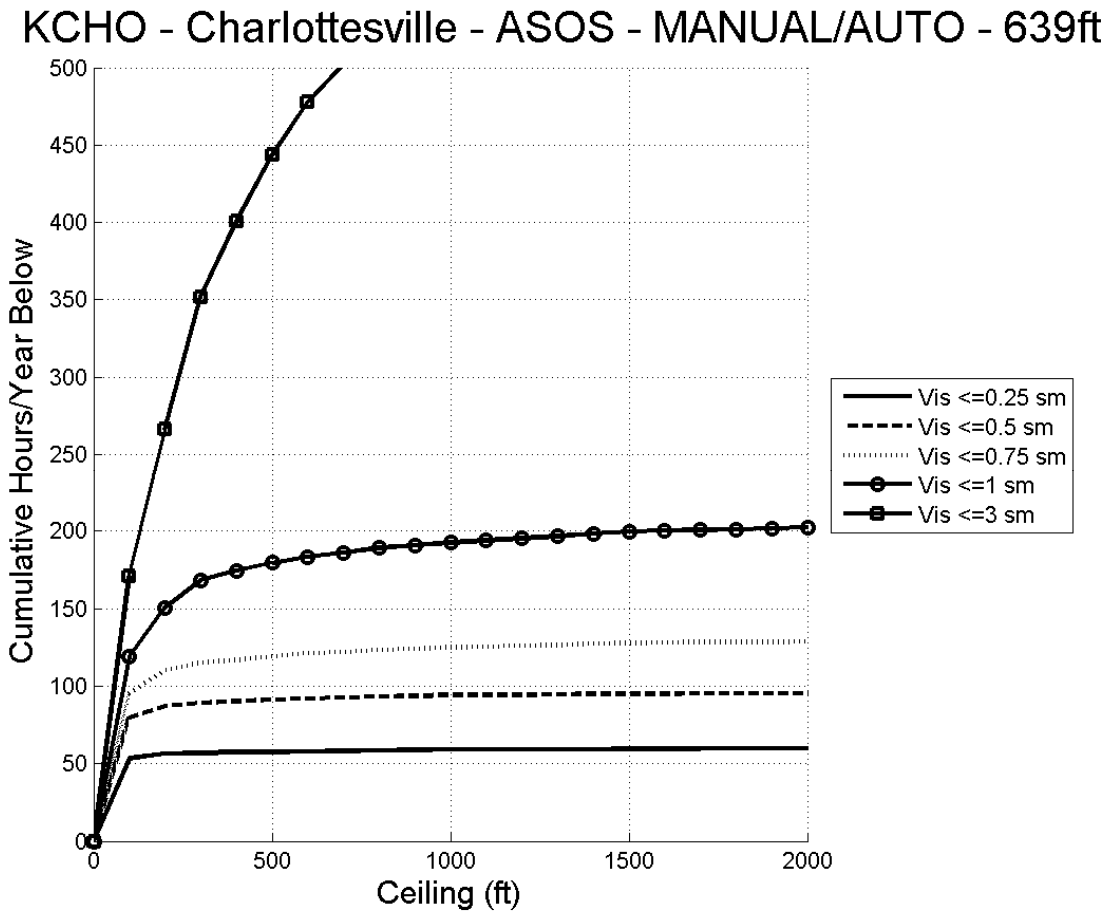
Ceiling vs. Visibility Charts for each weather station have been included on the following pages. These charts allow for a graphical analysis of the weather patterns.

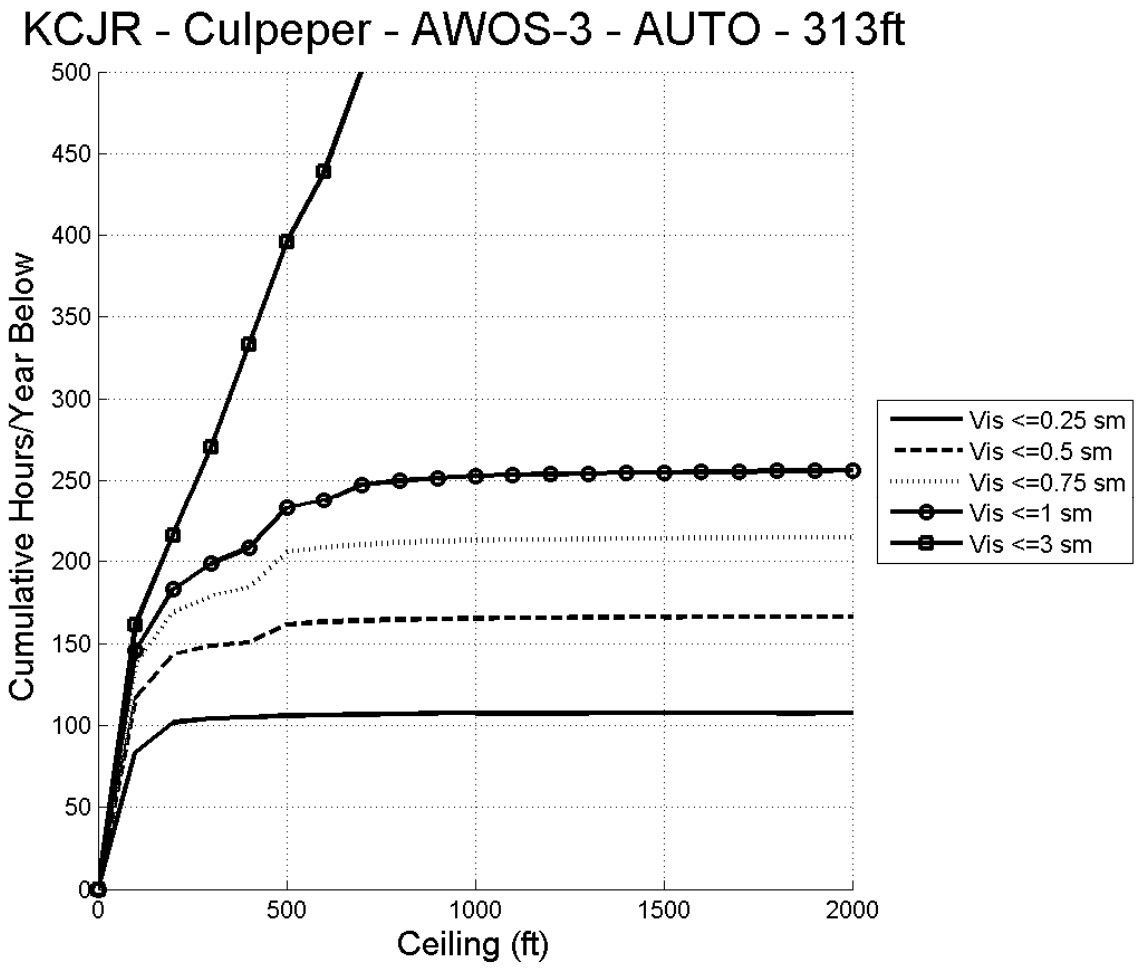

K6V3 - Richland - AWOS-3 - AUTO - 2652ft
Cumulative Hours/Year Below
Ceiling (ft)
0
50
100
150
200
250
300
350
400
450
500
0
500
1000
1500
2000
Vis <=0.25 sm
Vis <=0.5 sm
Vis <=0.75 sm
Vis <=1 sm
Vis <=3 sm

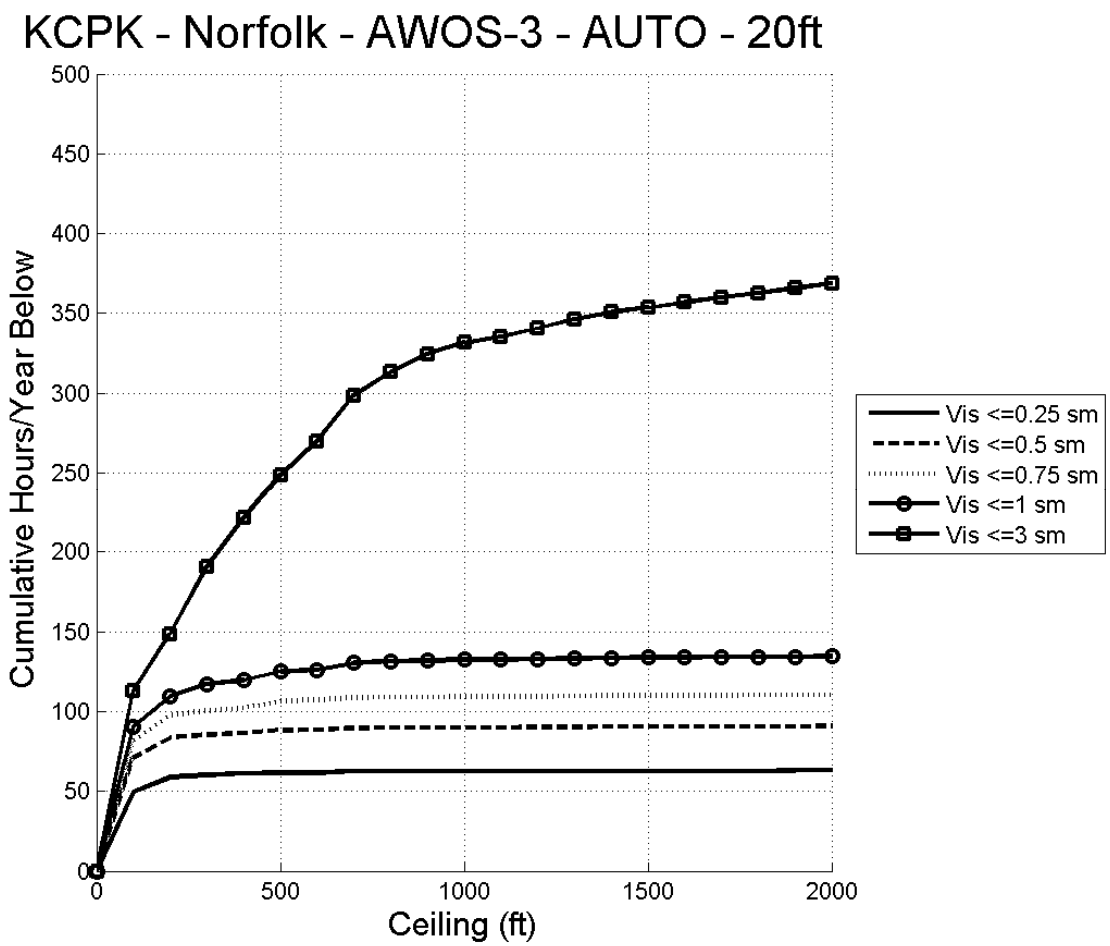

KAKQ - Wakefield - ASOS - AUTO - 113ft
Cumulative Hours/Year Below
Ceiling (ft)
0
50
100
150
200
250
300
350
400
450
500
0
500
1000
1500
2000
Vis <=0.25 sm
Vis <=0.5 sm
Vis <=0.75 sm
Vis <=1 sm
Vis <=3 sm

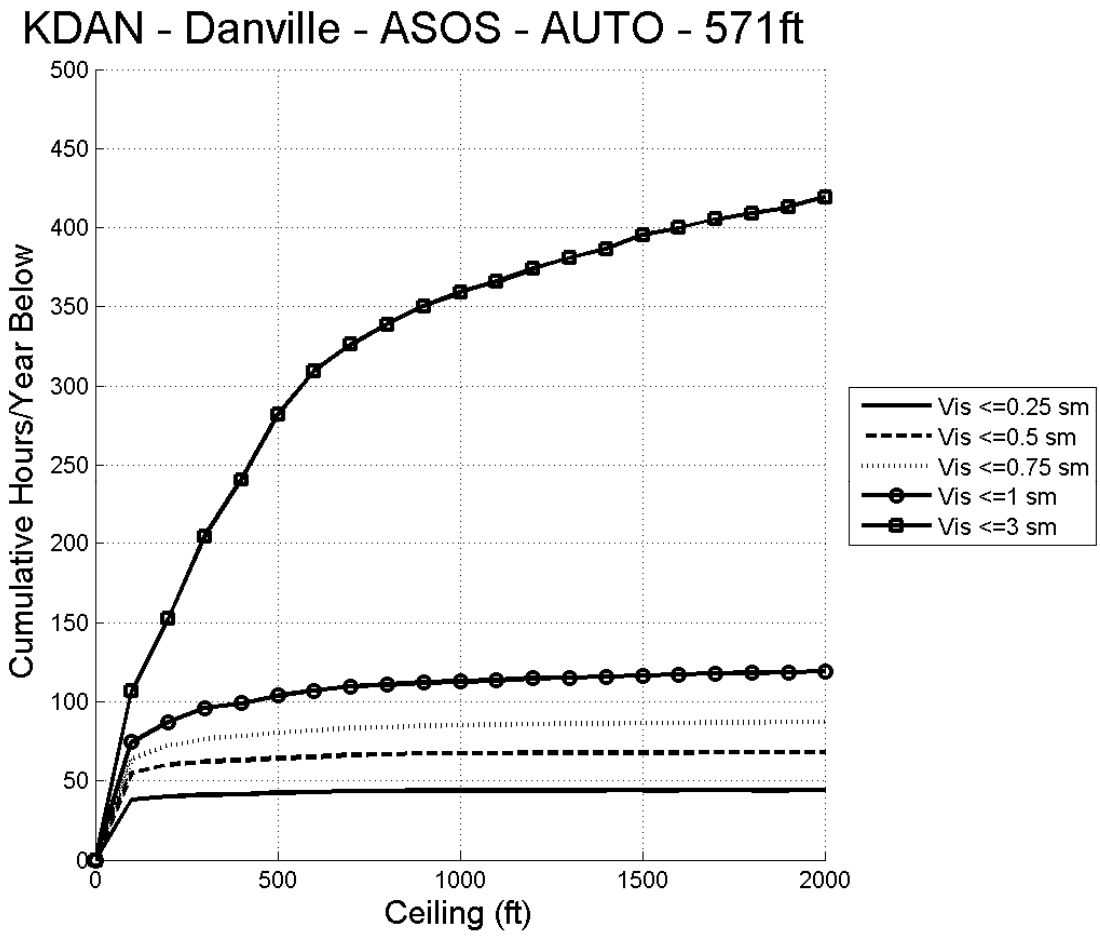

KAVC - South Hill - AWOS-3 - AUTO - 442ft
Cumulative Hours/Year Below
Ceiling (ft)
0
50
100
150
200
250
300
350
400
450
500
0
500
1000
1500
2000
Vis <=0.25 sm
Vis <=0.5 sm
Vis <=0.75 sm
Vis <=1 sm
Vis <=3 sm

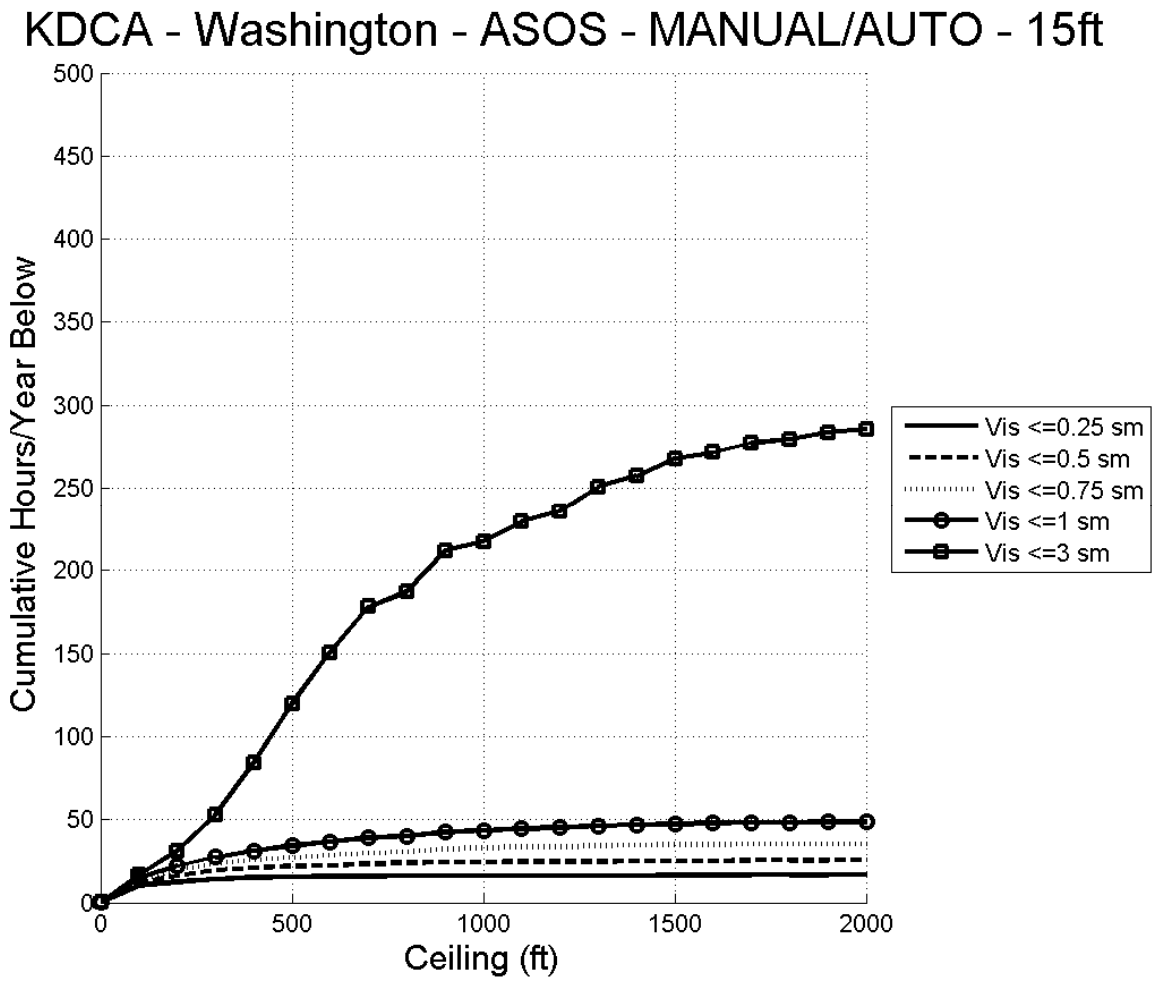

KBCB - Blacksburg - AWOS-3 - AUTO - 2132ft
Cumulative Hours/Year Below
Ceiling (ft)
0
50
100
150
200
250
300
350
400
450
500
0
500
1000
1500
2000
Vis <=0.25 sm
Vis <=0.5 sm
Vis <=0.75 sm
Vis <=1 sm
Vis <=3 sm


KCHO - Charlottesville - ASOS - MANUAL/AUTO - 639ft
Cumulative Hours/Year Below
Ceiling (ft)
0
50
100
150
200
250
300
350
400
450
500
0
500
1000
1500
2000
Vis <=0.25 sm
Vis <=0.5 sm
Vis <=0.75 sm
Vis <=1 sm
Vis <=3 sm


KCJR - Culpeper - AWOS-3 - AUTO - 313ft
Cumulative Hours/Year Below
Ceiling (ft)
0
50
100
150
200
250
300
350
400
450
500
0
500
1000
1500
2000
Vis <=0.25 sm
Vis <=0.5 sm
Vis <=0.75 sm
Vis <=1 sm
Vis <=3 sm


KCPK - Norfolk - AWOS-3 - AUTO - 20ft
Cumulative Hours/Year Below
Ceiling (ft)
0
50
100
150
200
250
300
350
400
450
500
0
500
1000
1500
2000
Vis <=0.25 sm
Vis <=0.5 sm
Vis <=0.75 sm
Vis <=1 sm
Vis <=3 sm


KDAN - Danville - ASOS - AUTO - 571ft
Cumulative Hours/Year Below
Ceiling (ft)
0
50
100
150
200
250
300
350
400
450
500
0
500
1000
1500
2000
Vis <=0.25 sm
Vis <=0.5 sm
Vis <=0.75 sm
Vis <=1 sm
Vis <=3 sm


KDCA - Washington - ASOS - MANUAL/AUTO - 15ft
Cumulative Hours/Year Below
Ceiling (ft)
0
50
100
150
200
250
300
350
400
450
500
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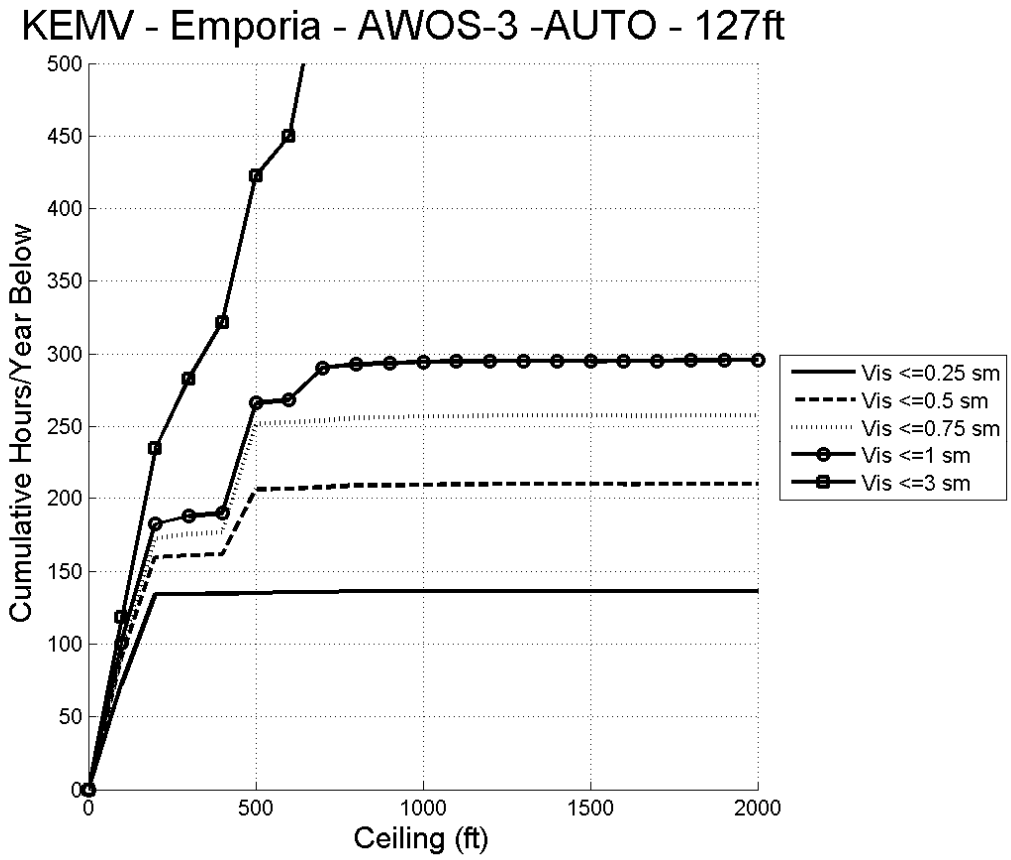
2000
Vis <=0.25 sm
Vis <=0.5 sm
Vis <=0.75 sm
Vis <=1 sm
Vis <=3 sm


KEMV - Emporia - AWOS-3 -AUTO - 127ft
Cumulative Hours/Year Below
Ceiling (ft)
0
50
100
150
200
250
300
350
400
450
500
0
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1000
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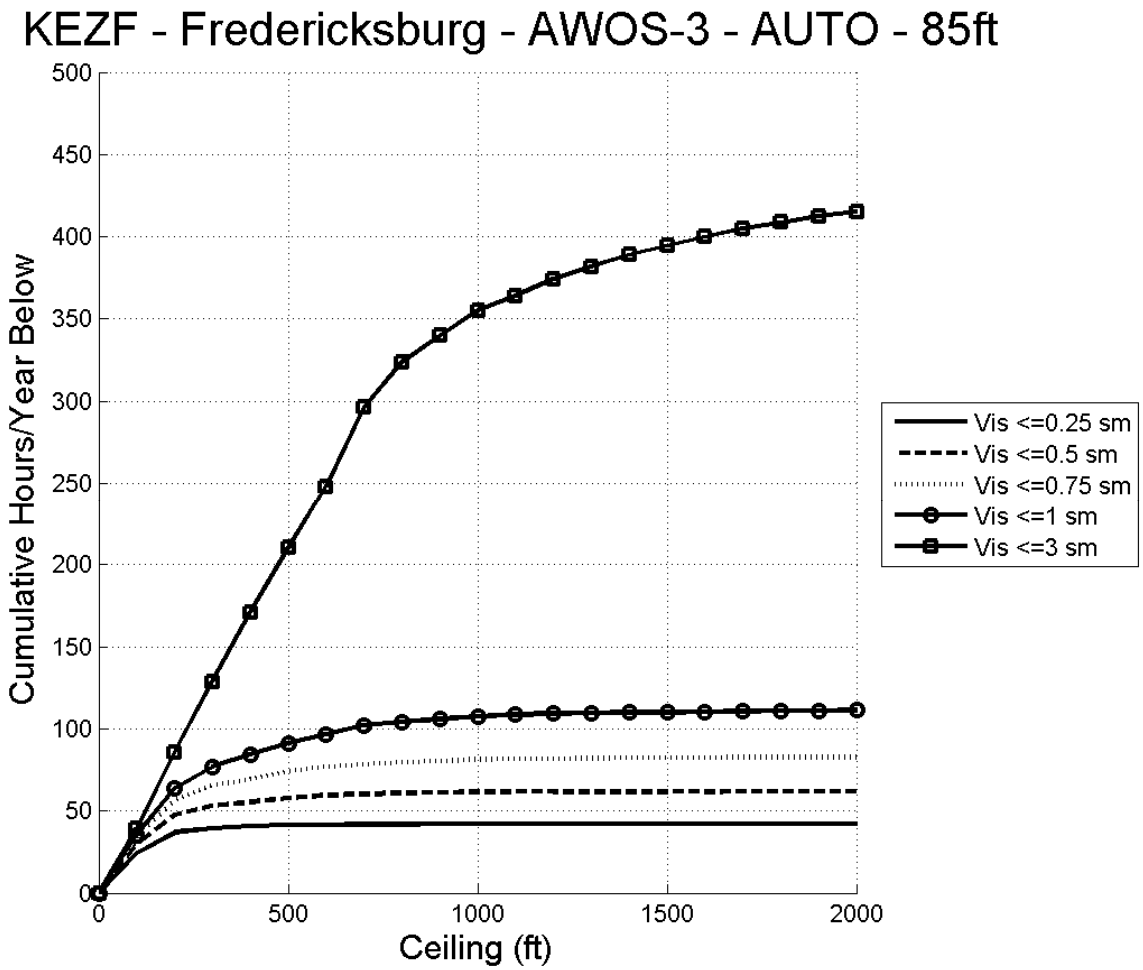
2000
Vis <=0.25 sm
Vis <=0.5 sm
Vis <=0.75 sm
Vis <=1 sm
Vis <=3 sm


KEZF - Fredericksburg - AWOS-3 - AUTO - 85ft
Cumulative Hours/Year Below
Ceiling (ft)
0
50
100
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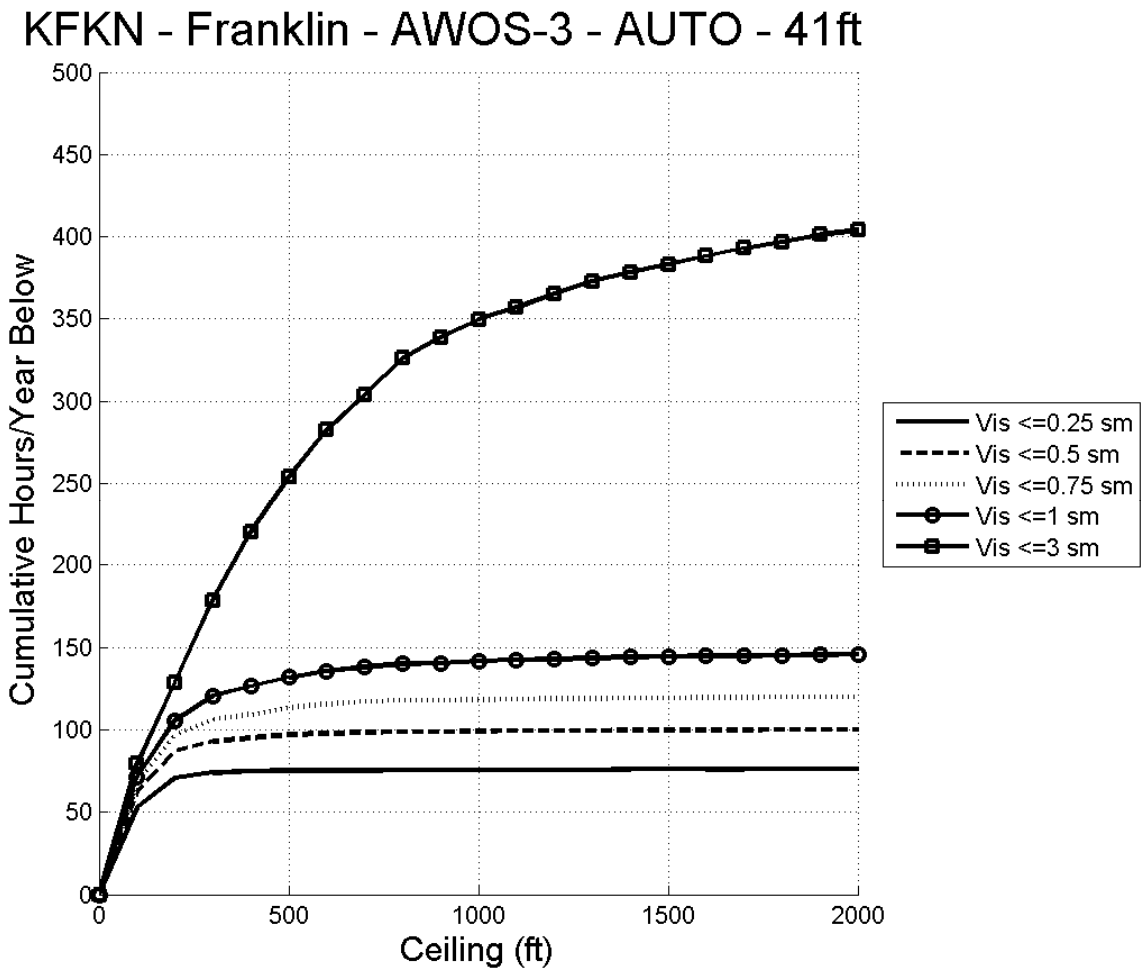
Vis <=0.25 sm
Vis <=0.5 sm
Vis <=0.75 sm
Vis <=1 sm
Vis <=3 sm


KFKN - Franklin - AWOS-3 - AUTO - 41ft
Cumulative Hours/Year Below
Ceiling (ft)
0
50
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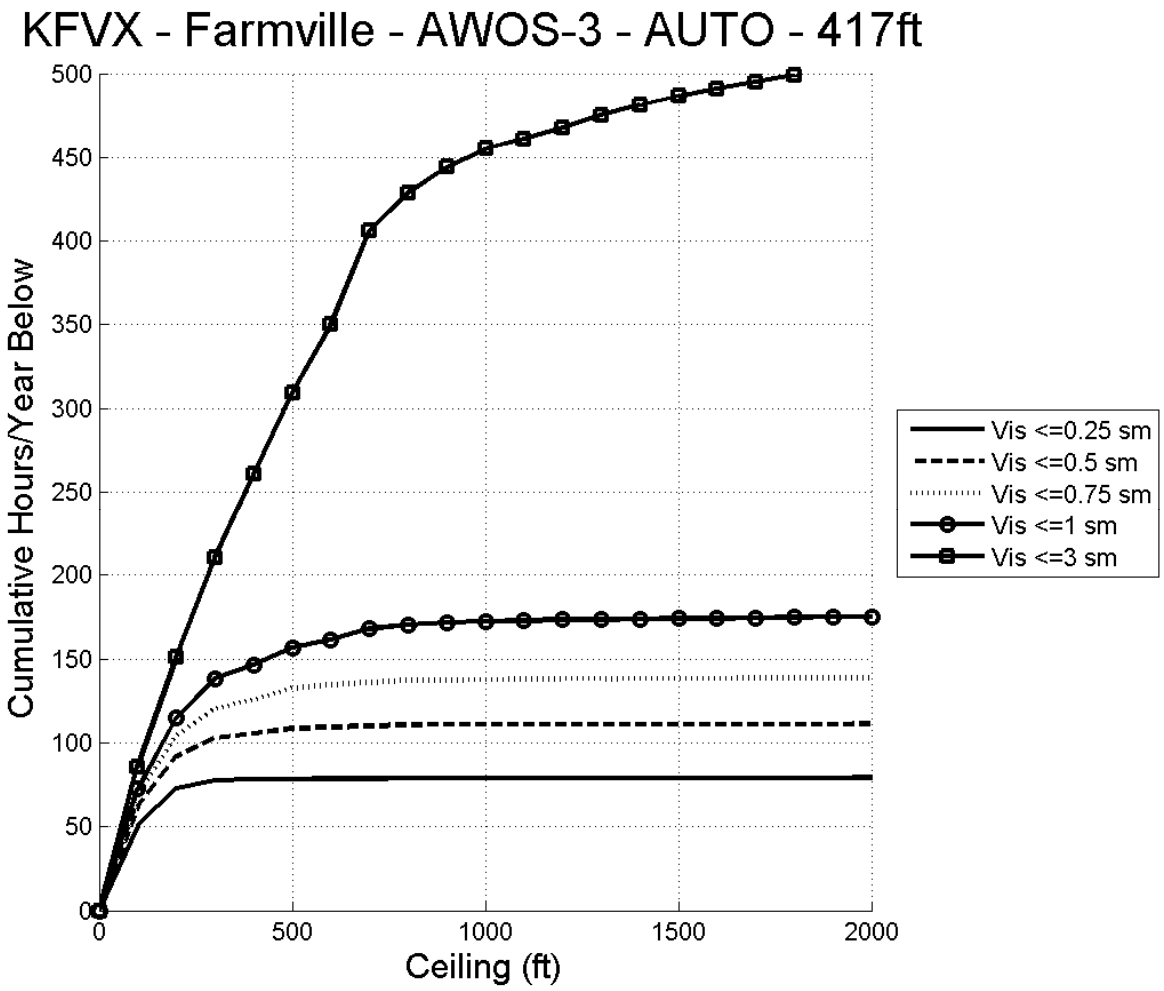
Vis <=0.25 sm
Vis <=0.5 sm
Vis <=0.75 sm
Vis <=1 sm
Vis <=3 sm


KFVX - Farmville - AWOS-3 - AUTO - 417ft
Cumulative Hours/Year Below
Ceiling (ft)
0
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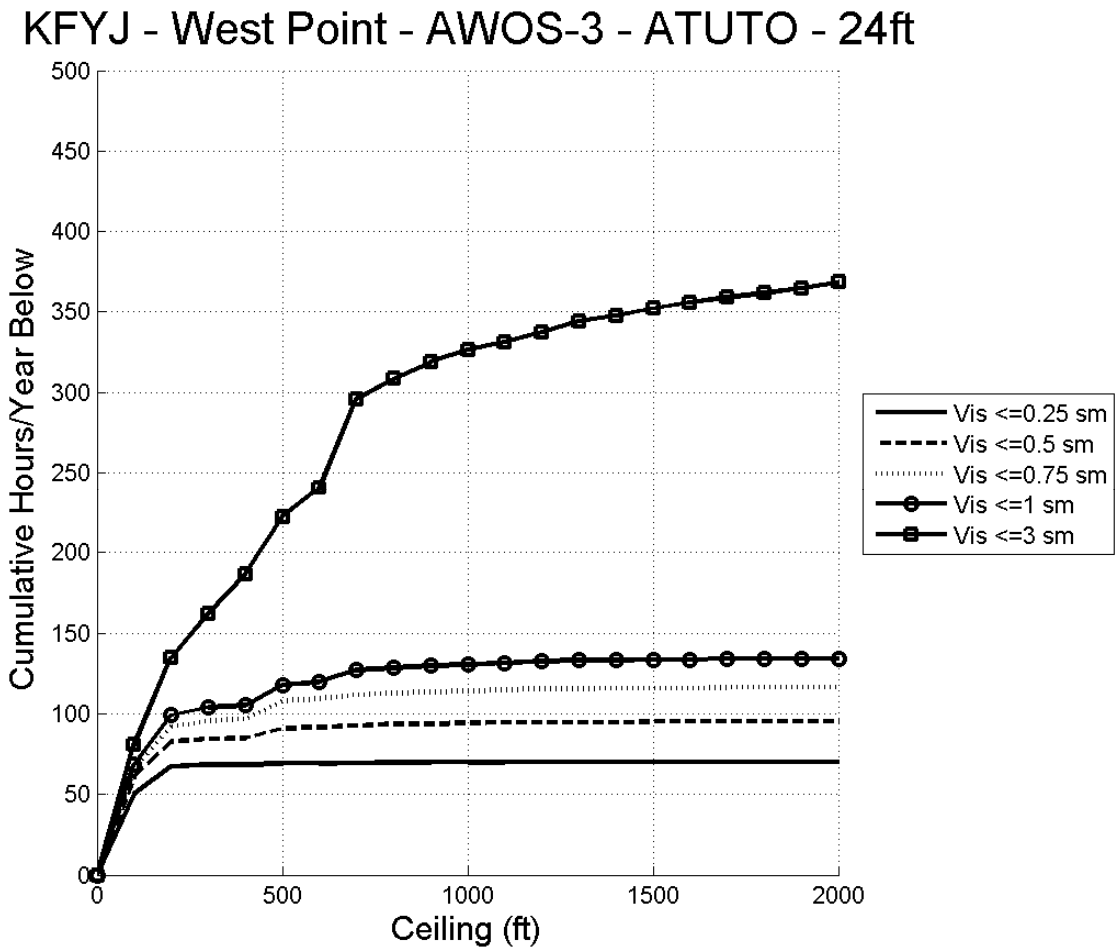
Vis <=0.25 sm
Vis <=0.5 sm
Vis <=0.75 sm
Vis <=1 sm
Vis <=3 sm


KFYJ - West Point - AWOS-3 - ATUTO - 24ft
Cumulative Hours/Year Below
Ceiling (ft)
0
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300
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450
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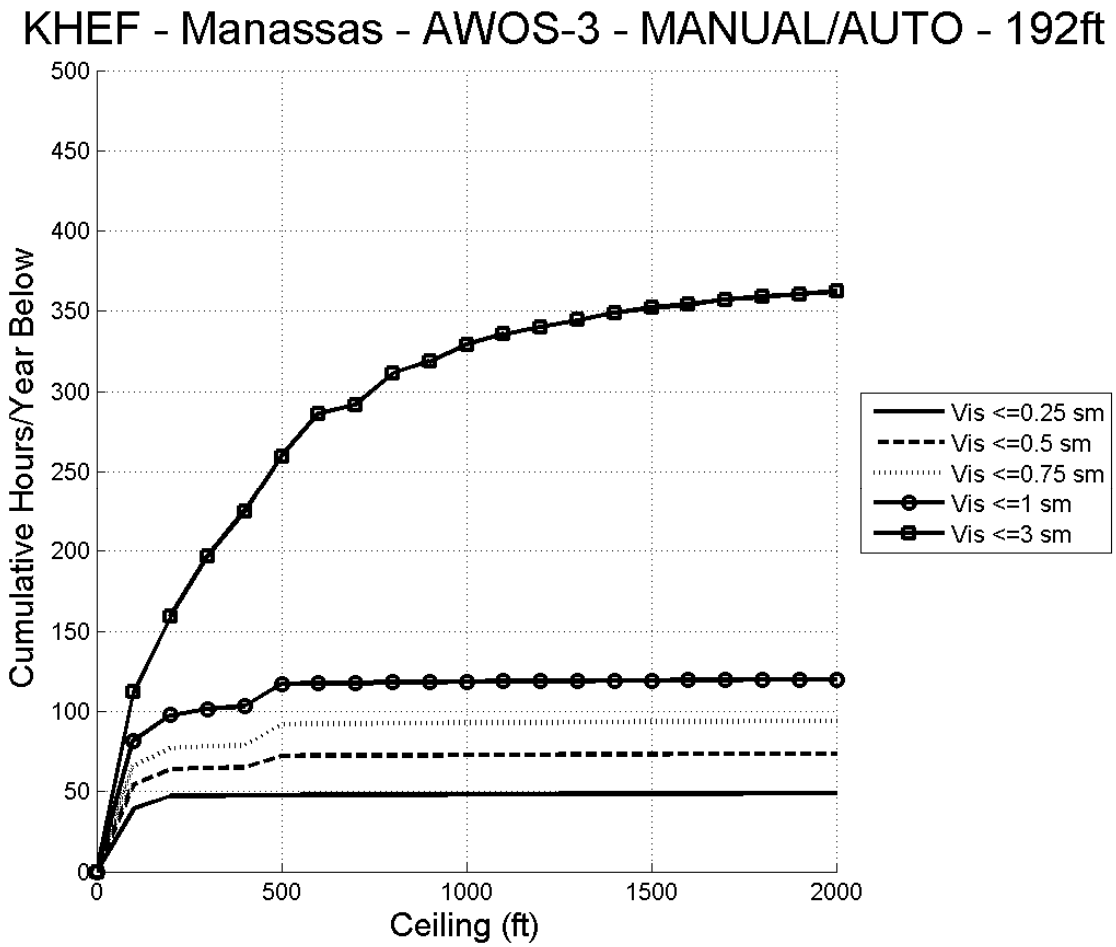
2000
Vis <=0.25 sm
Vis <=0.5 sm
Vis <=0.75 sm
Vis <=1 sm
Vis <=3 sm


KHEF - Manassas - AWOS-3 - MANUAL/AUTO - 192ft
Cumulative Hours/Year Below
Ceiling (ft)
0
50
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300
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400
450
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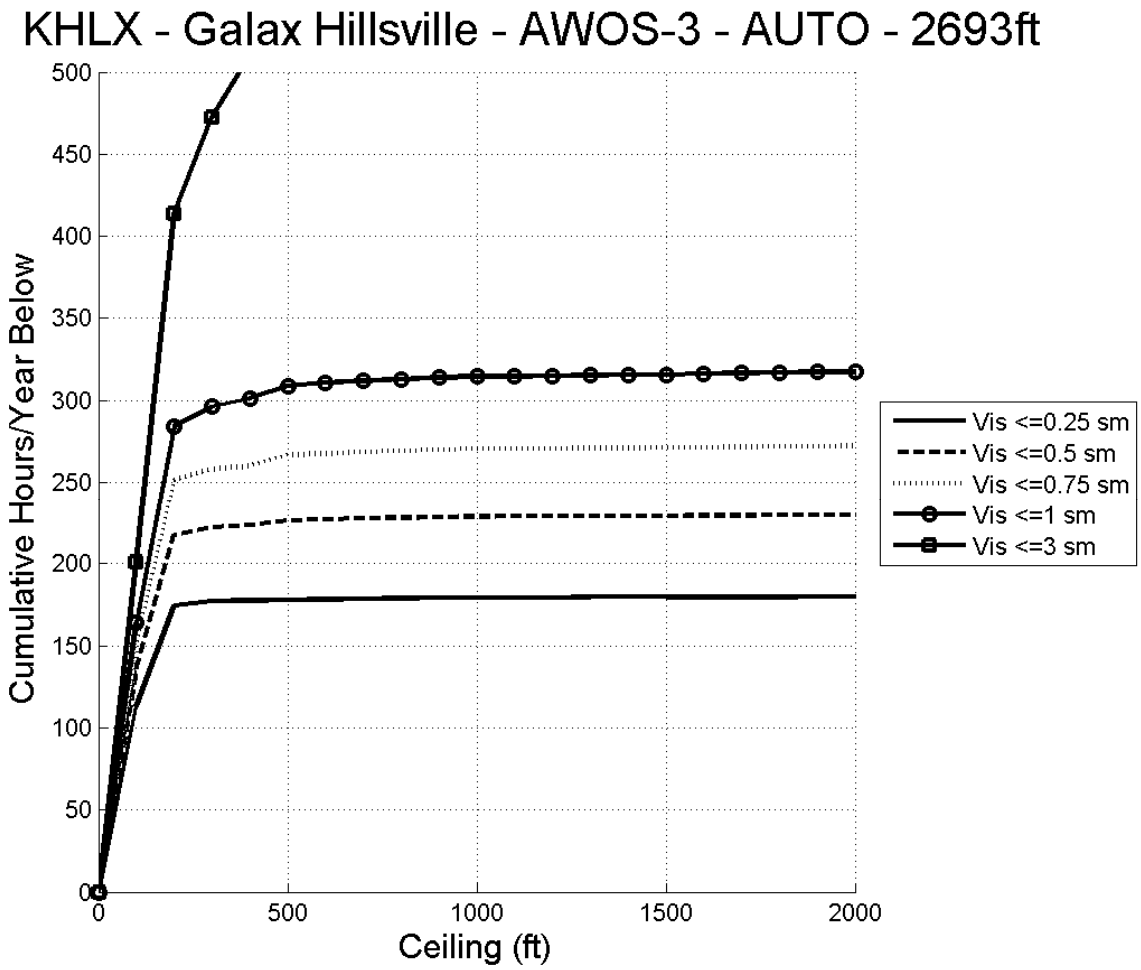
Vis <=0.25 sm
Vis <=0.5 sm
Vis <=0.75 sm
Vis <=1 sm
Vis <=3 sm


KHLX - Galax Hillsville - AWOS-3 - AUTO - 2693ft
Cumulative Hours/Year Below
Ceiling (ft)
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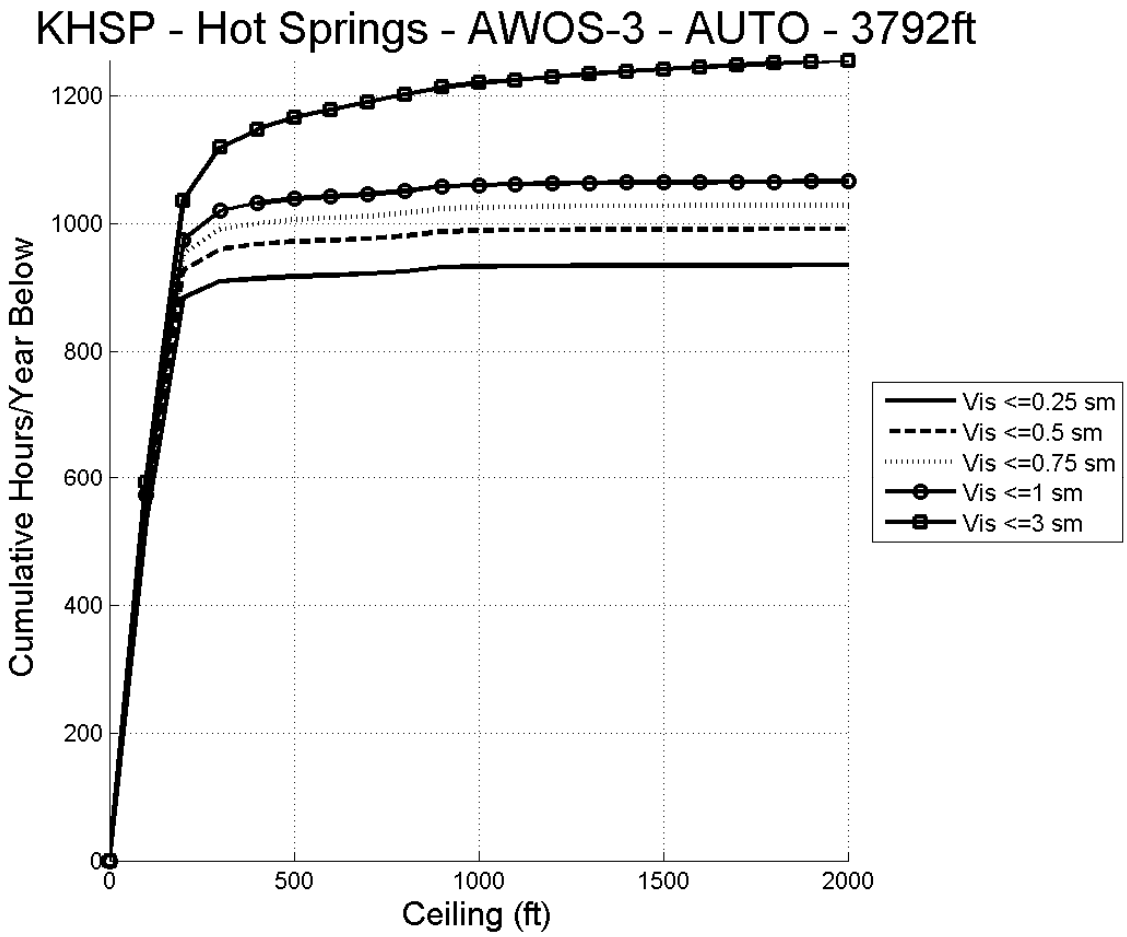
Vis <=0.25 sm
Vis <=0.5 sm
Vis <=0.75 sm
Vis <=1 sm
Vis <=3 sm


KHSP - Hot Springs - AWOS-3 - AUTO - 3792ft
Cumulative Hours/Year Below
Ceiling (ft)
0
200
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1200
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500
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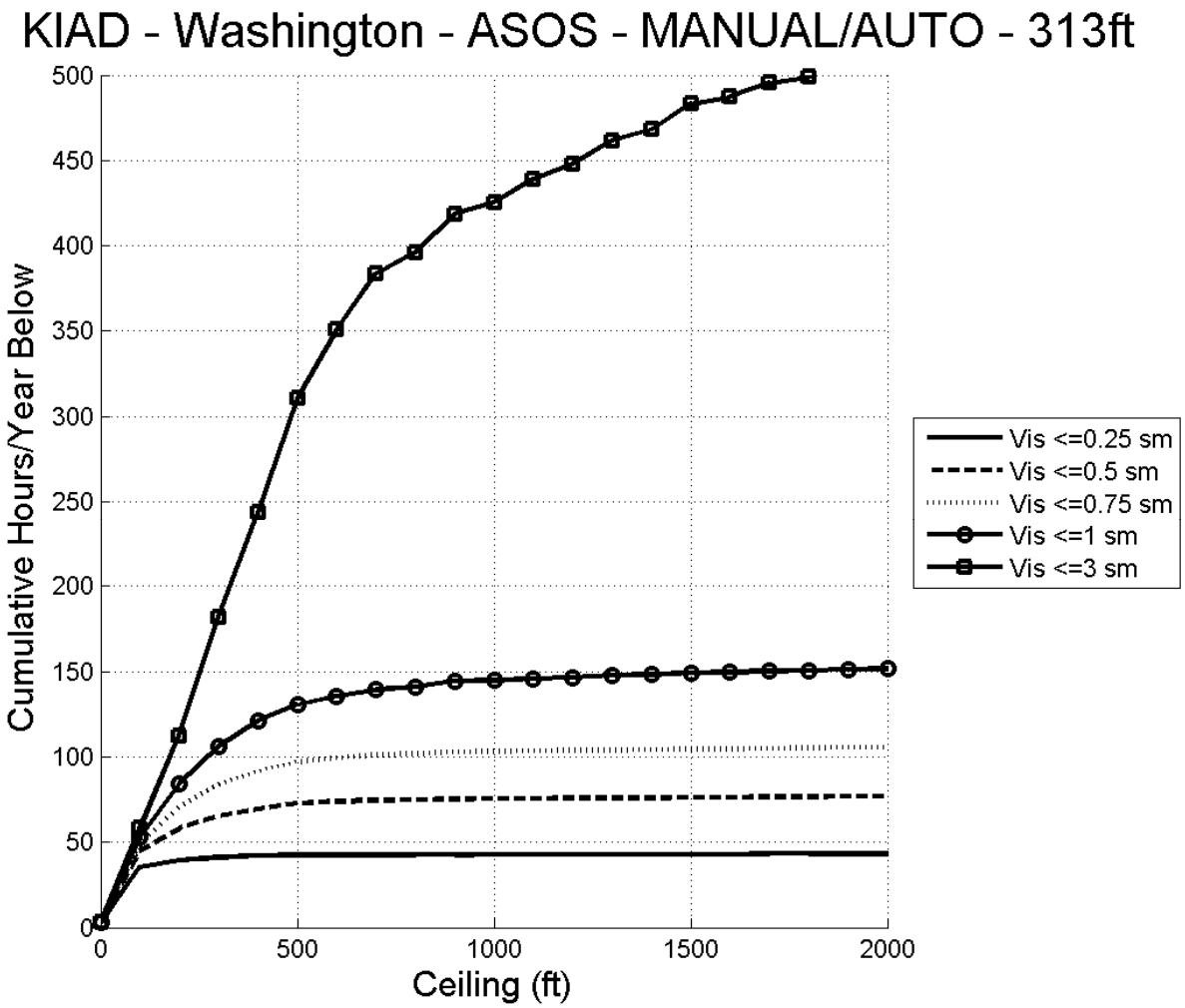
Vis <=0.25 sm
Vis <=0.5 sm
Vis <=0.75 sm
Vis <=1 sm
Vis <=3 sm


KIAD - Washington - ASOS - MANUAL/AUTO - 313ft
Cumulative Hours/Year Below
Ceiling (ft)
0
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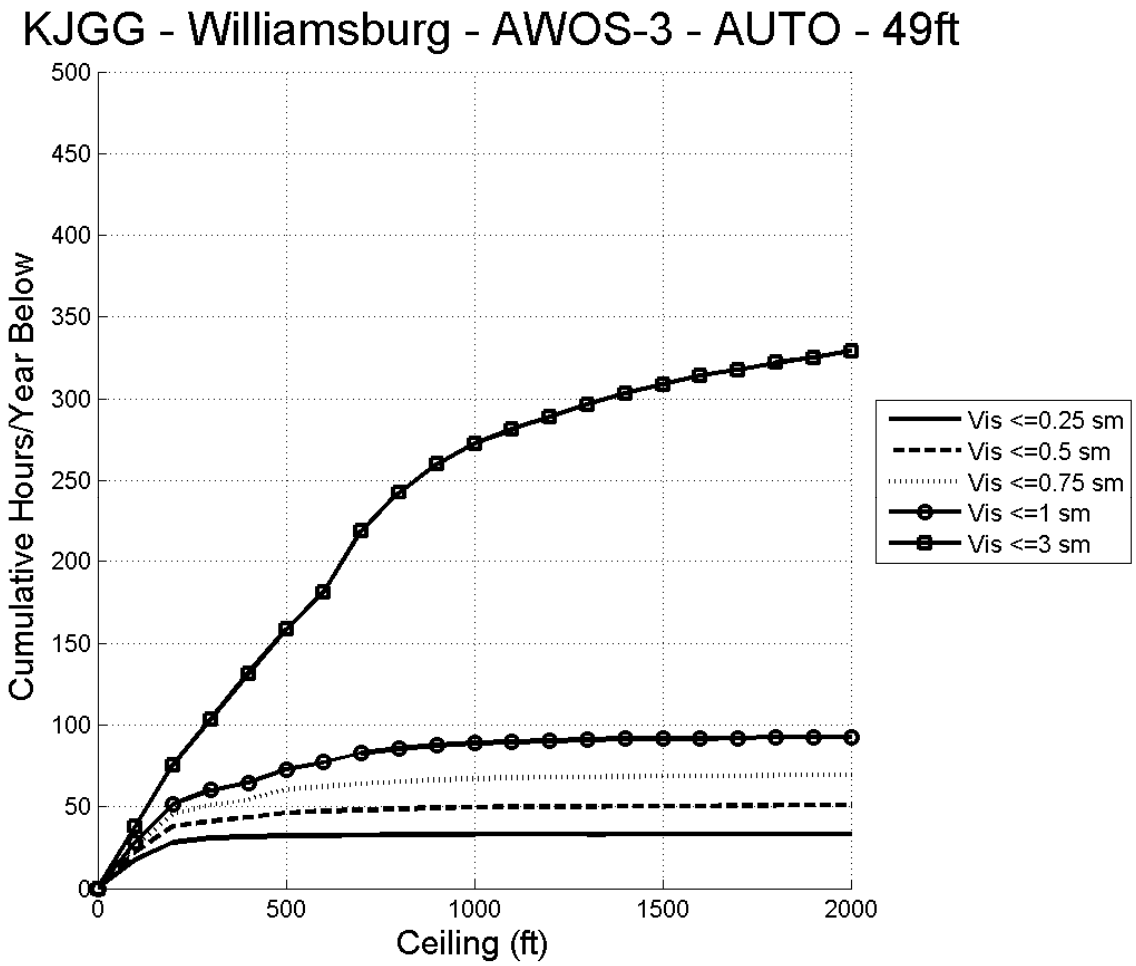
Vis <=0.25 sm
Vis <=0.5 sm
Vis <=0.75 sm
Vis <=1 sm
Vis <=3 sm


KJGG - Williamsburg - AWOS-3 - AUTO - 49ft
Cumulative Hours/Year Below
Ceiling (ft)
0
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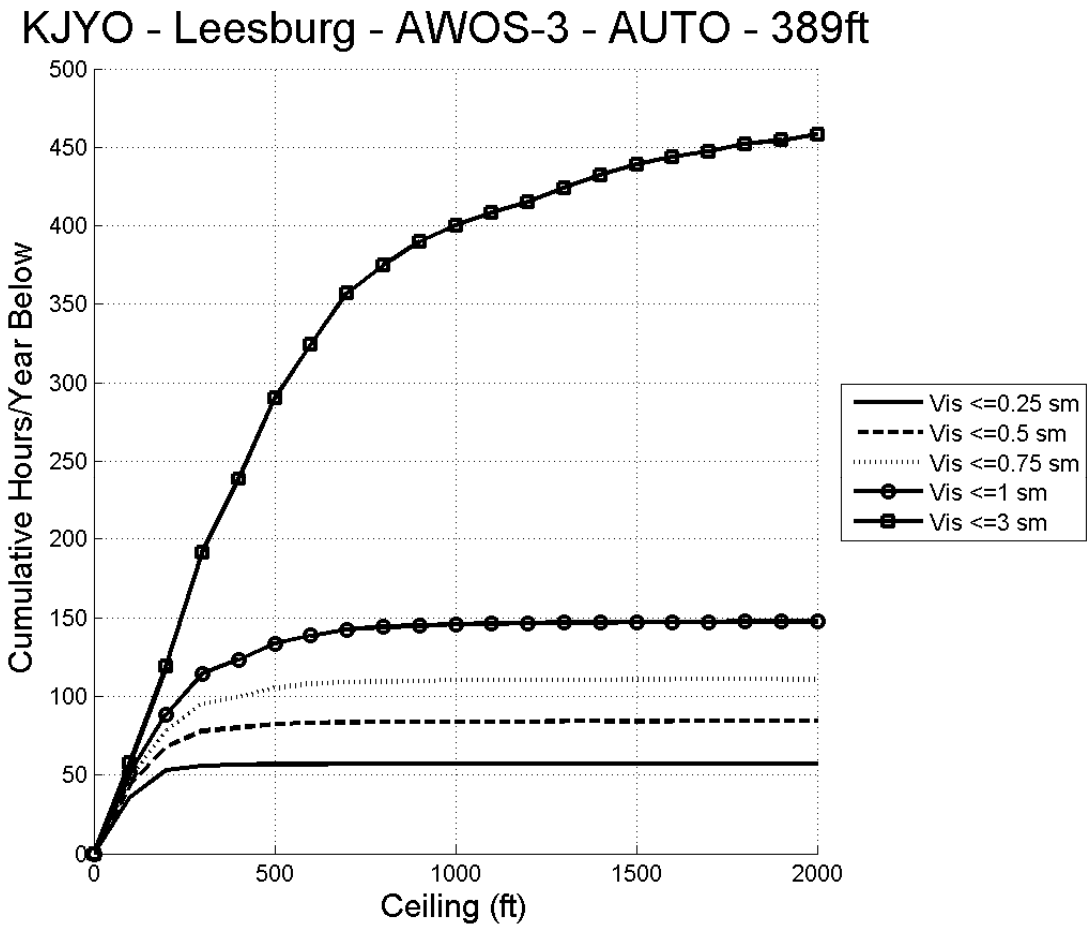
Vis <=0.25 sm
Vis <=0.5 sm
Vis <=0.75 sm
Vis <=1 sm
Vis <=3 sm


KJYO - Leesburg - AWOS-3 - AUTO - 389ft
Cumulative Hours/Year Below
Ceiling (ft)
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300
350
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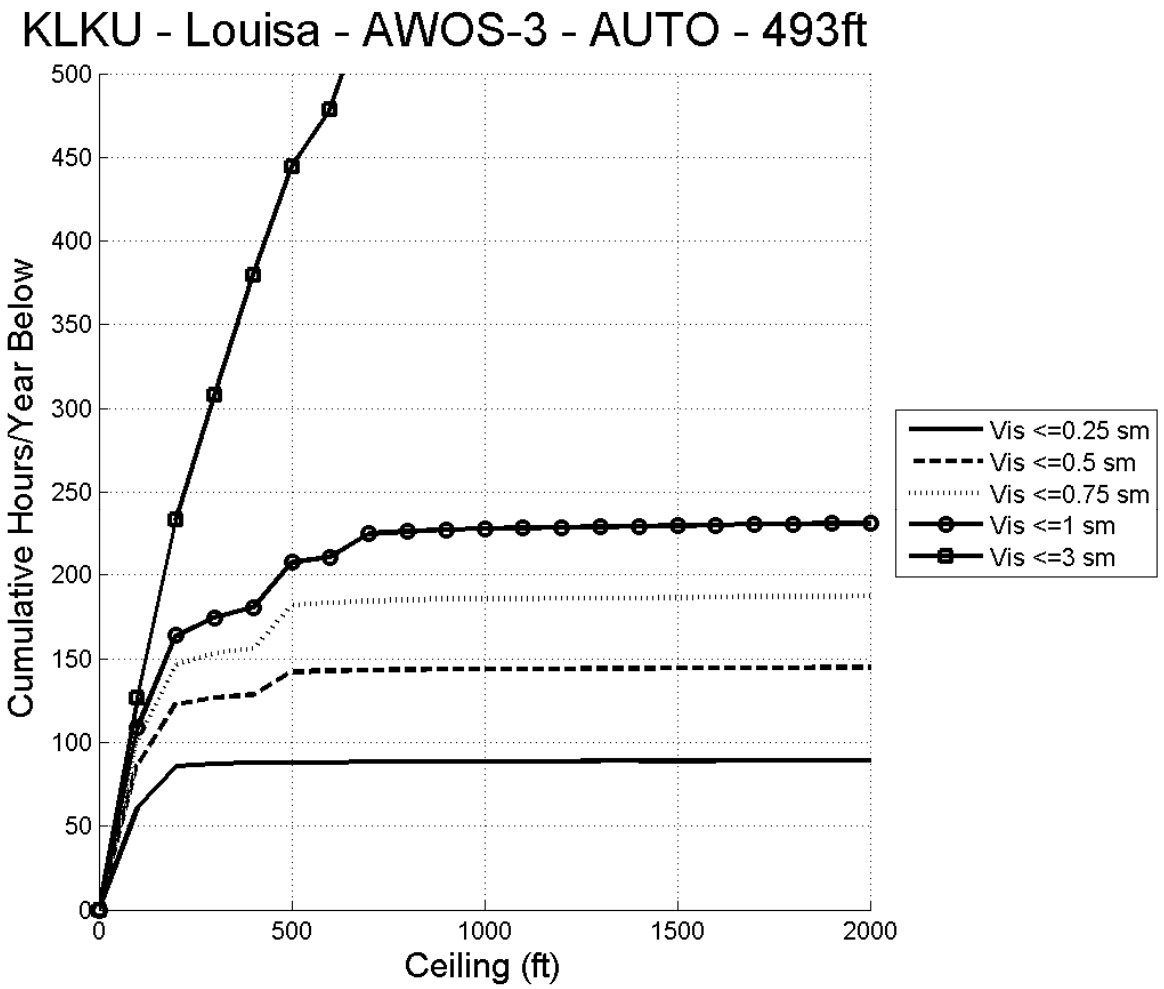
Vis <=0.25 sm
Vis <=0.5 sm
Vis <=0.75 sm
Vis <=1 sm
Vis <=3 sm


KLKU - Louisa - AWOS-3 - AUTO - 493ft
Cumulative Hours/Year Below
Ceiling (ft)
0
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100
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300
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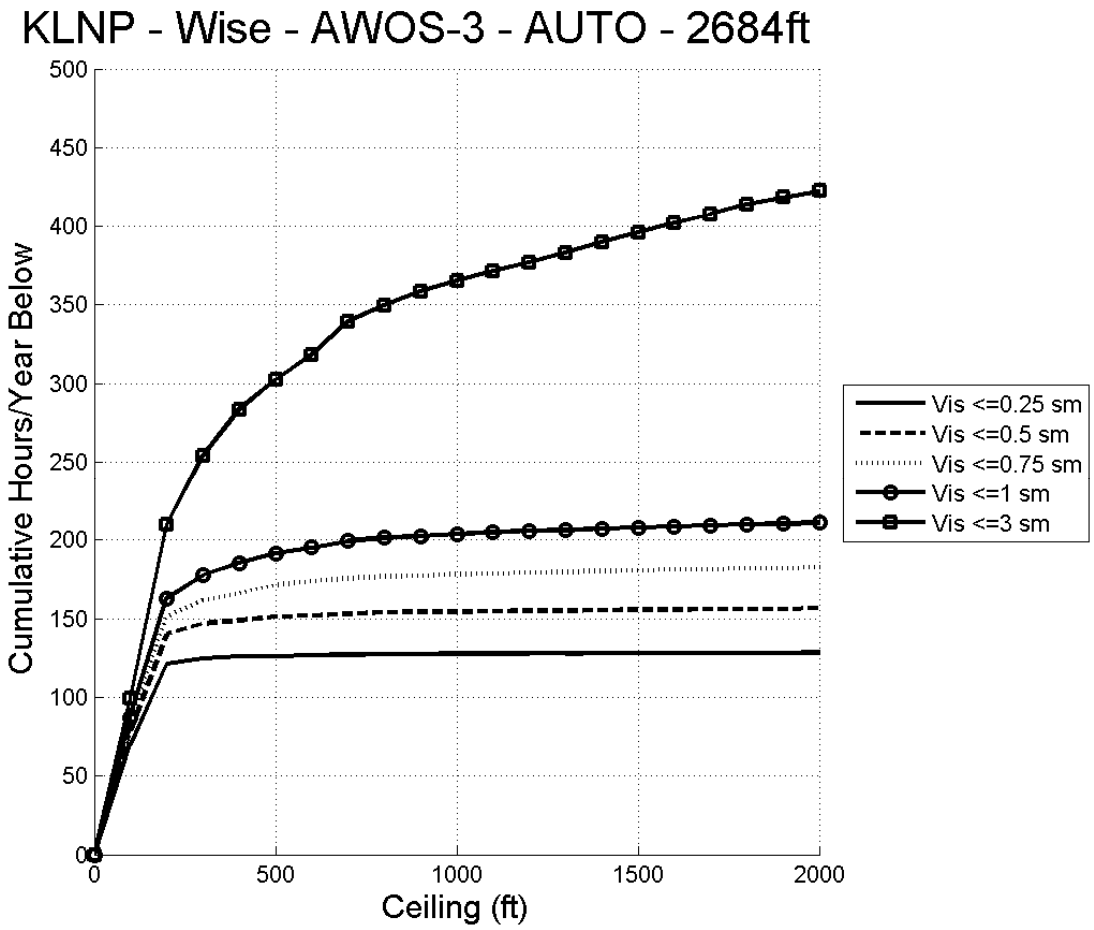
Vis <=0.25 sm
Vis <=0.5 sm
Vis <=0.75 sm
Vis <=1 sm
Vis <=3 sm


KLNP - Wise - AWOS-3 - AUTO - 2684ft
Cumulative Hours/Year Below
Ceiling (ft)
0
50
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200
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400
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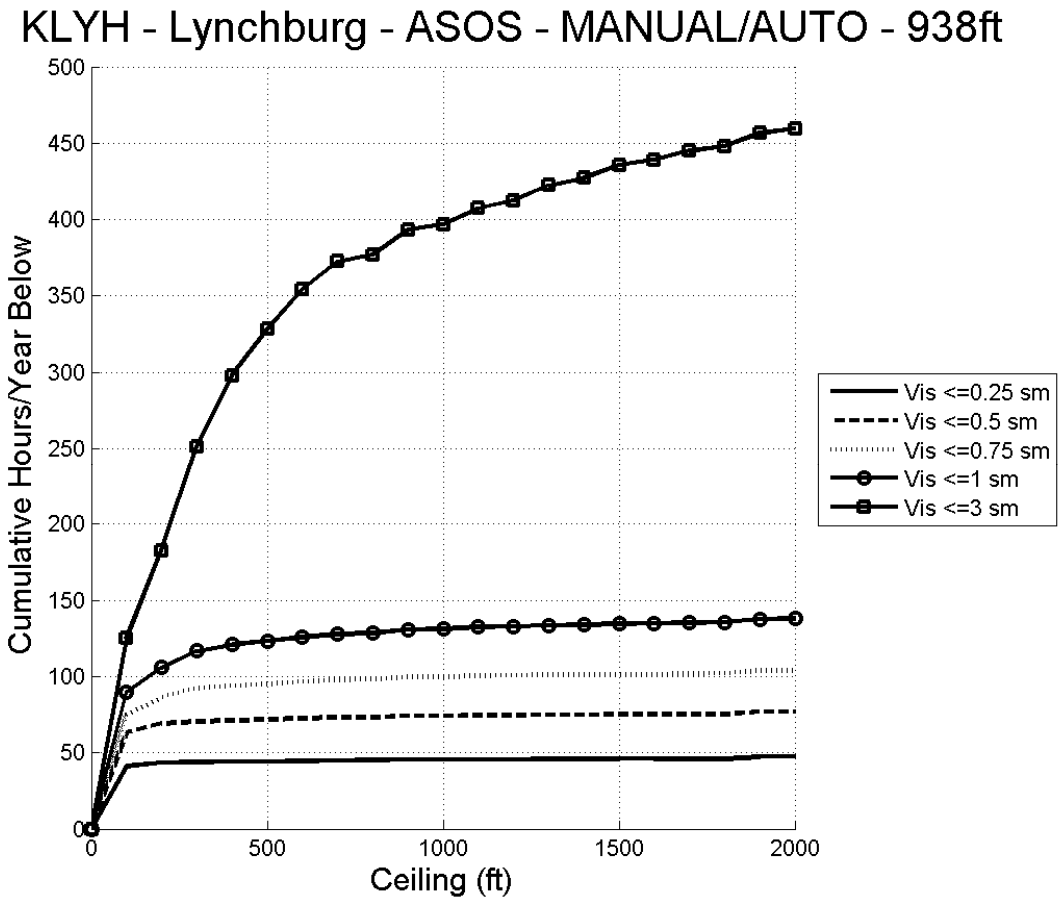
Vis <=0.25 sm
Vis <=0.5 sm
Vis <=0.75 sm
Vis <=1 sm
Vis <=3 sm


KLYH - Lynchburg - ASOS - MANUAL/AUTO - 938ft
Cumulative Hours/Year Below
Ceiling (ft)
0
50
100
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250
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350
400
450
500
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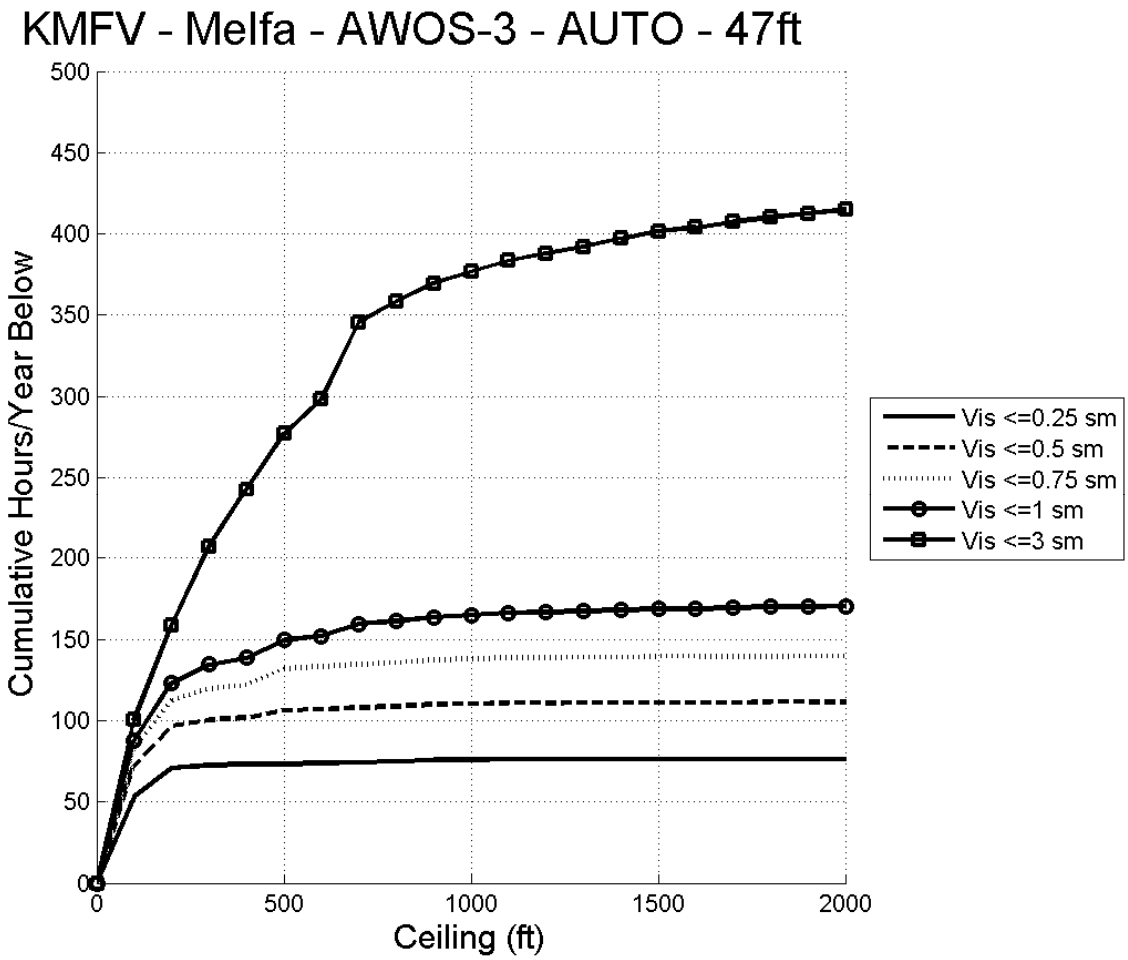
500
1000
1500
2000
Vis <=0.25 sm
Vis <=0.5 sm
Vis <=0.75 sm
Vis <=1 sm
Vis <=3 sm


KMFV - Melfa - AWOS-3 - AUTO - 47ft
Cumulative Hours/Year Below
Ceiling (ft)
0
50
100
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250
300
350
400
450
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1000
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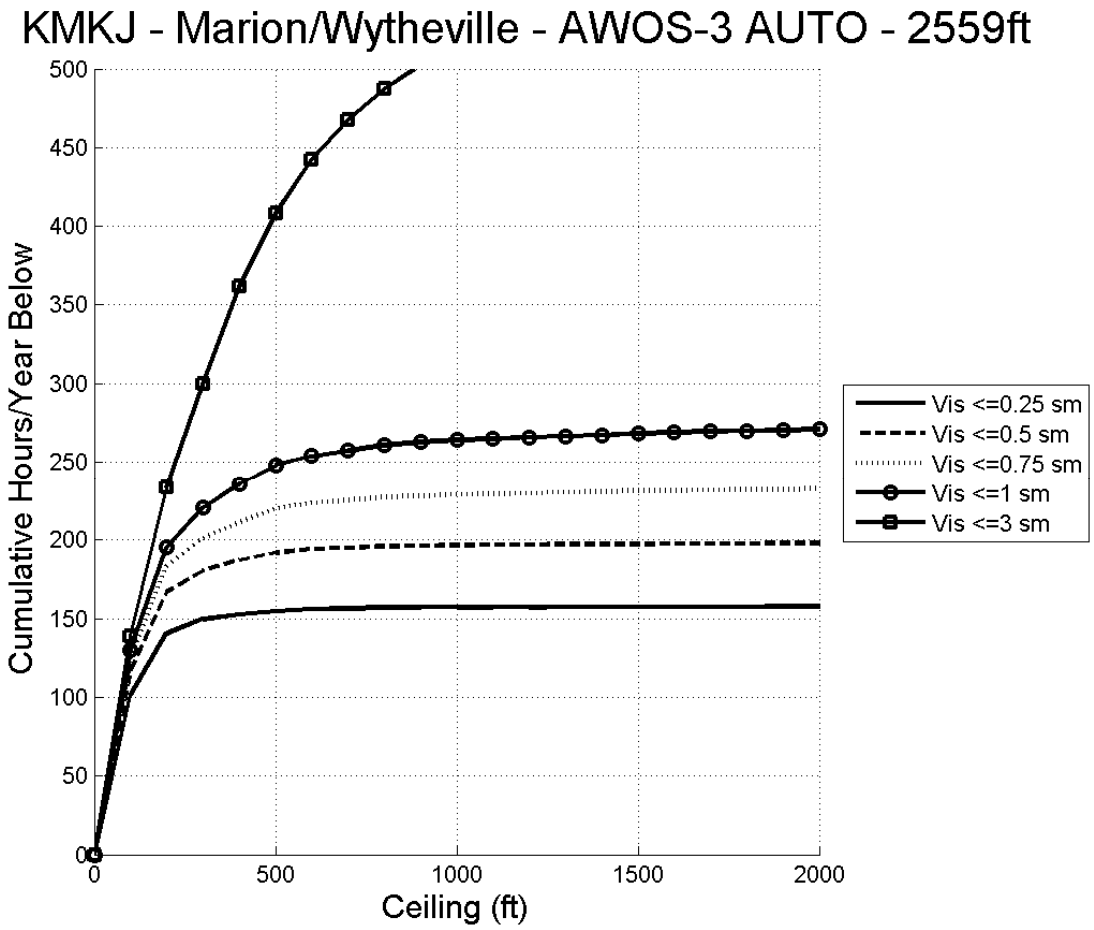
2000
Vis <=0.25 sm
Vis <=0.5 sm
Vis <=0.75 sm
Vis <=1 sm
Vis <=3 sm


KMKJ - Marion/Wytheville - AWOS-3 AUTO - 2559ft
Cumulative Hours/Year Below
Ceiling (ft)
0
50
100
150
200
250
300
350
400
450
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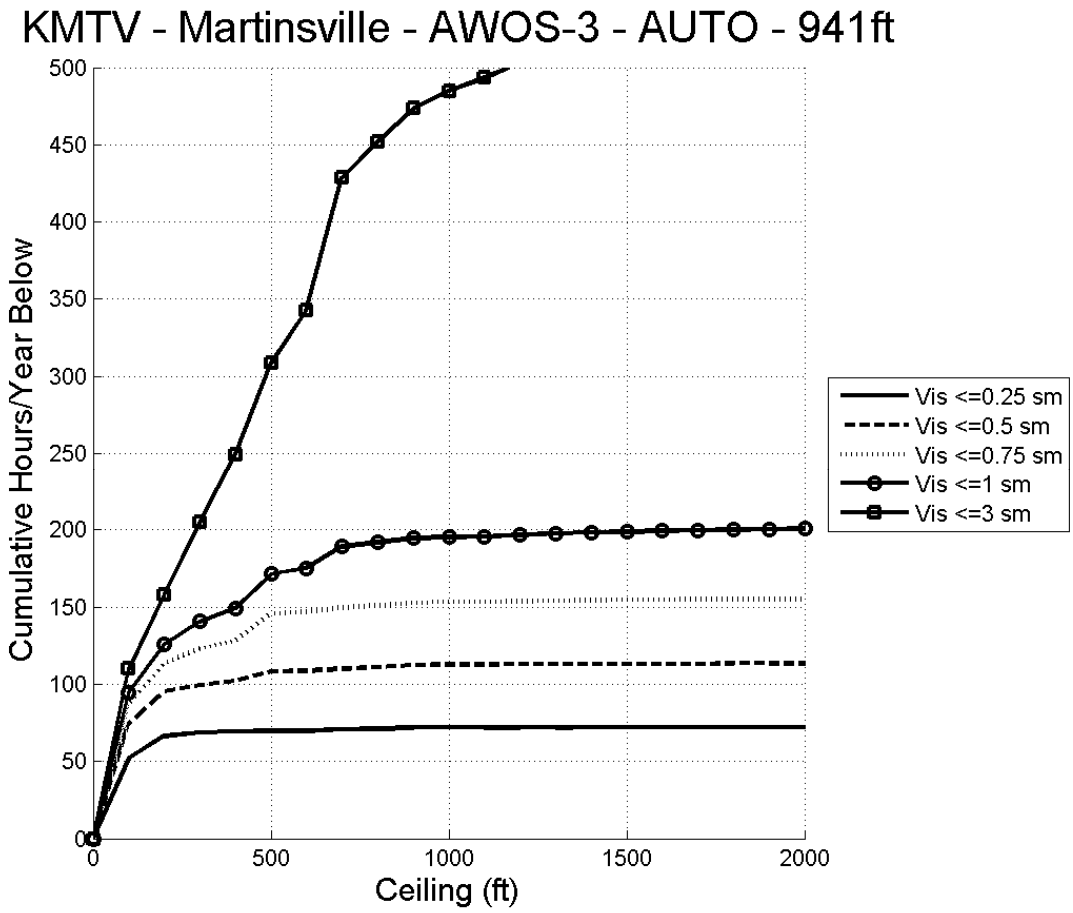
1500
2000
Vis <=0.25 sm
Vis <=0.5 sm
Vis <=0.75 sm
Vis <=1 sm
Vis <=3 sm


KMTV - Martinsville - AWOS-3 - AUTO - 941ft
Cumulative Hours/Year Below
Ceiling (ft)
0
50
100
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200
250
300
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400
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1000
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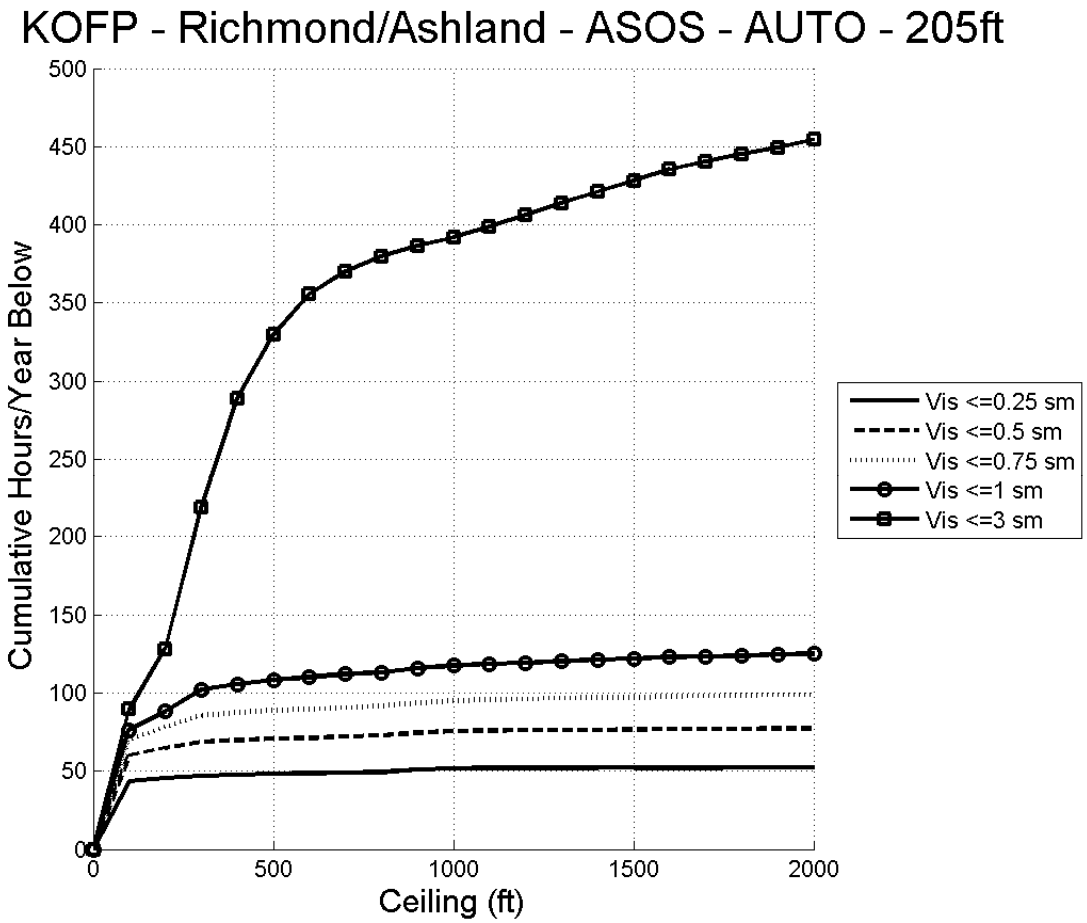
2000
Vis <=0.25 sm
Vis <=0.5 sm
Vis <=0.75 sm
Vis <=1 sm
Vis <=3 sm


KOFP - Richmond/Ashland - ASOS - AUTO - 205ft
Cumulative Hours/Year Below
Ceiling (ft)
0
50
100
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200
250
300
350
400
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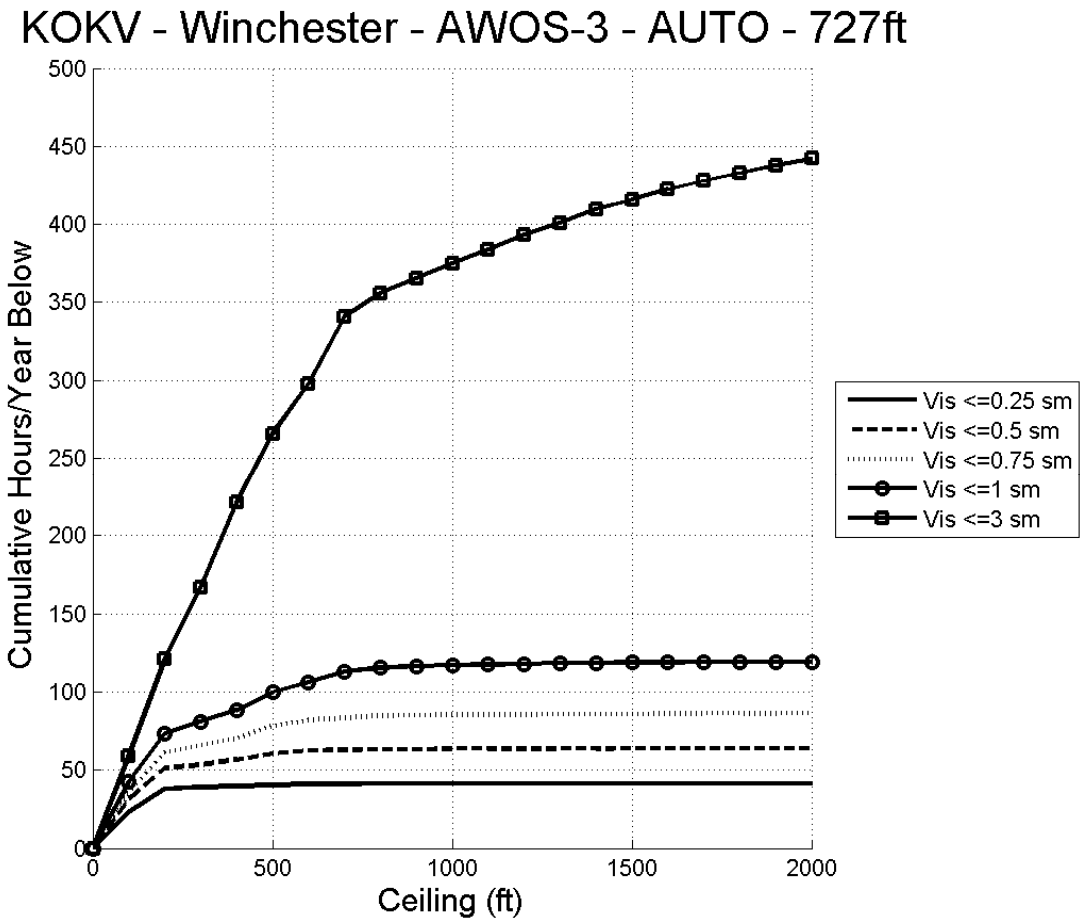
1000
1500
2000
Vis <=0.25 sm
Vis <=0.5 sm
Vis <=0.75 sm
Vis <=1 sm
Vis <=3 sm


KOKV - Winchester - AWOS-3 - AUTO - 727ft
Cumulative Hours/Year Below
Ceiling (ft)
0
50
100
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200
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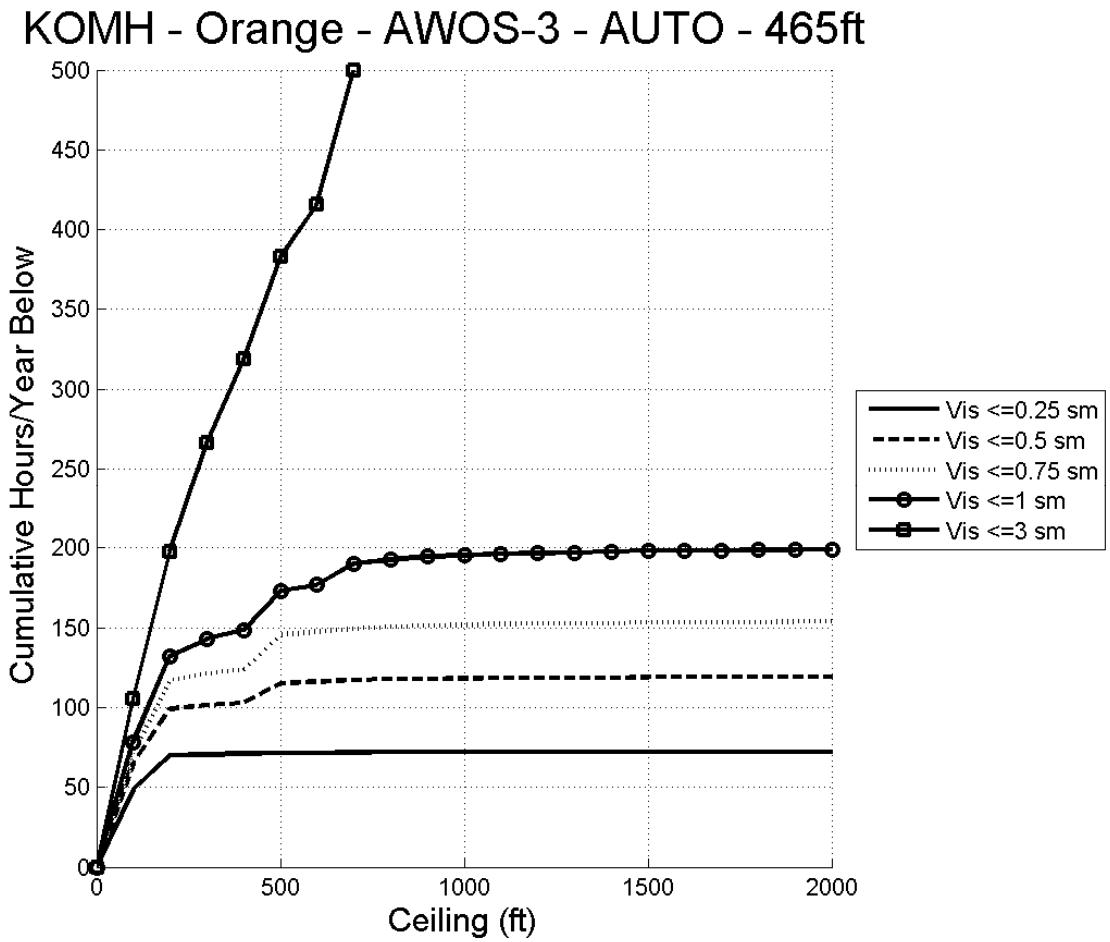
2000
Vis <=0.25 sm
Vis <=0.5 sm
Vis <=0.75 sm
Vis <=1 sm
Vis <=3 sm


KOMH - Orange - AWOS-3 - AUTO - 465ft
Cumulative Hours/Year Below
Ceiling (ft)
0
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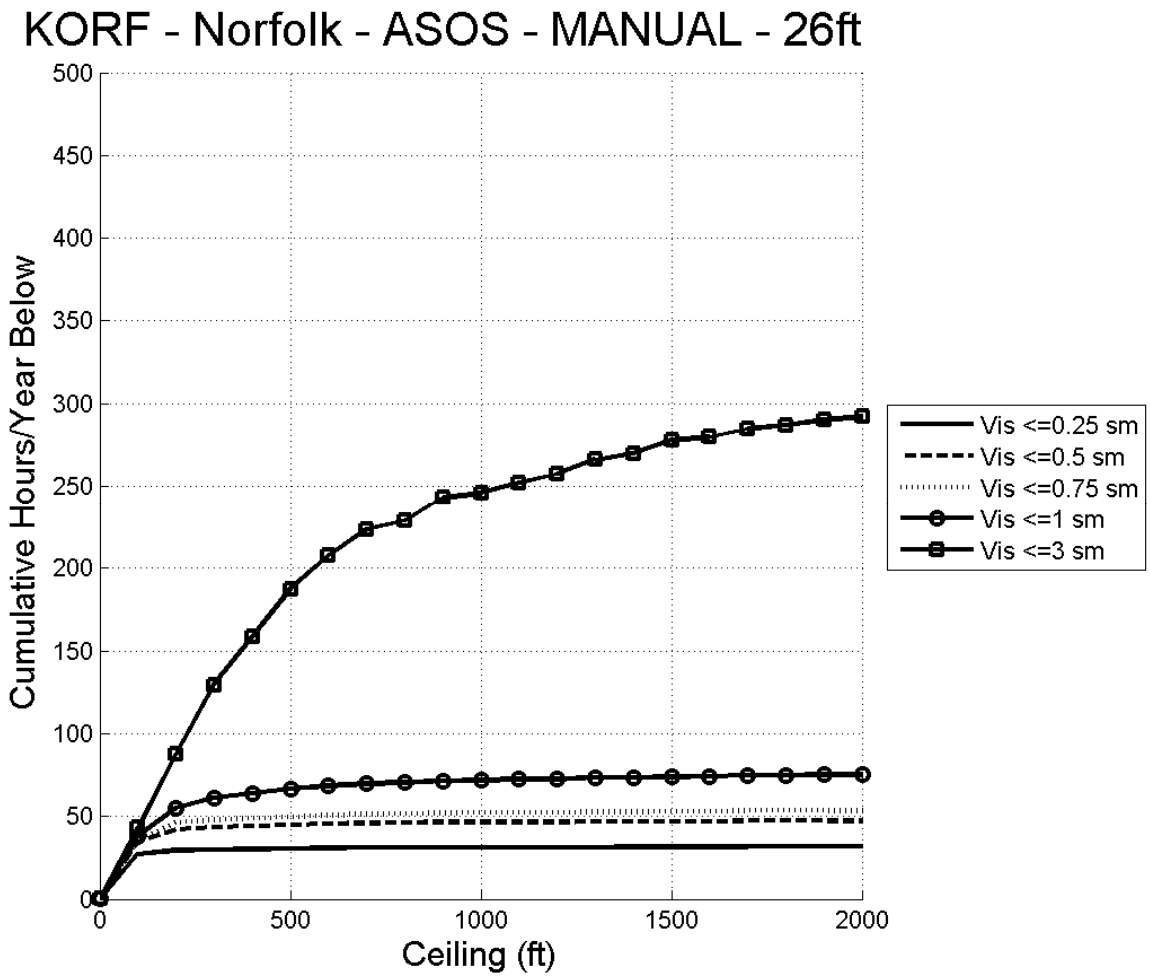
Vis <=0.25 sm
Vis <=0.5 sm
Vis <=0.75 sm
Vis <=1 sm
Vis <=3 sm


KORF - Norfolk - ASOS - MANUAL - 26ft
Cumulative Hours/Year Below
Ceiling (ft)
0
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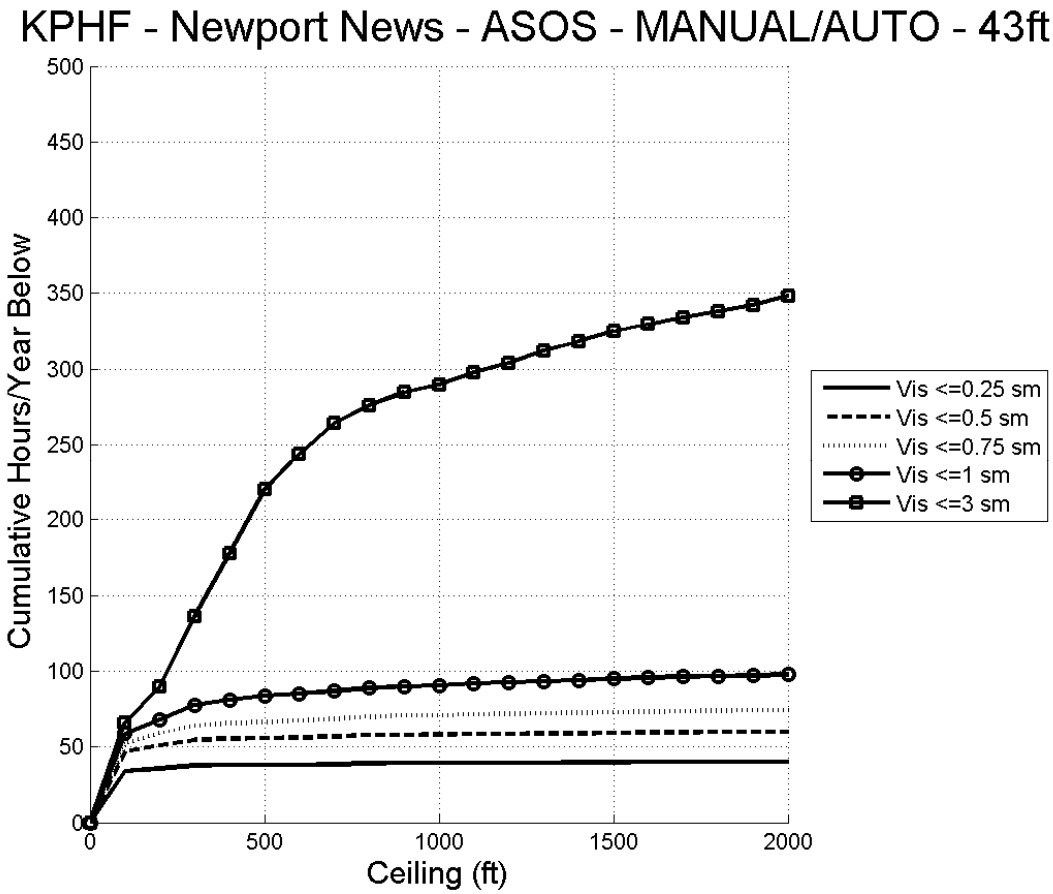
2000
Vis <=0.25 sm
Vis <=0.5 sm
Vis <=0.75 sm
Vis <=1 sm
Vis <=3 sm


KPHF - Newport News - ASOS - MANUAL/AUTO - 43ft
Cumulative Hours/Year Below
Ceiling (ft)
0
50
100
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200
250
300
350
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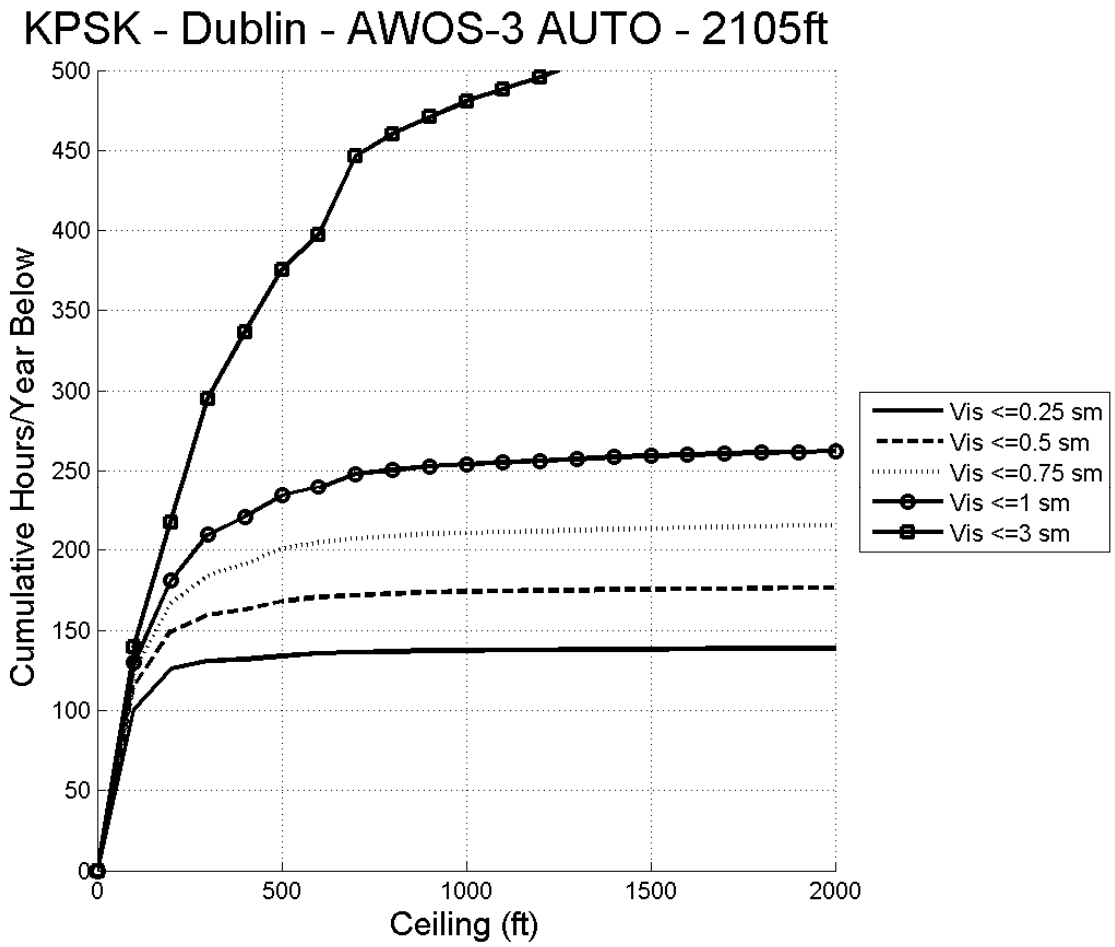
2000
Vis <=0.25 sm
Vis <=0.5 sm
Vis <=0.75 sm
Vis <=1 sm
Vis <=3 sm


KPSK - Dublin - AWOS-3 AUTO - 2105ft
Cumulative Hours/Year Below
Ceiling (ft)
0
50
100
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200
250
300
350
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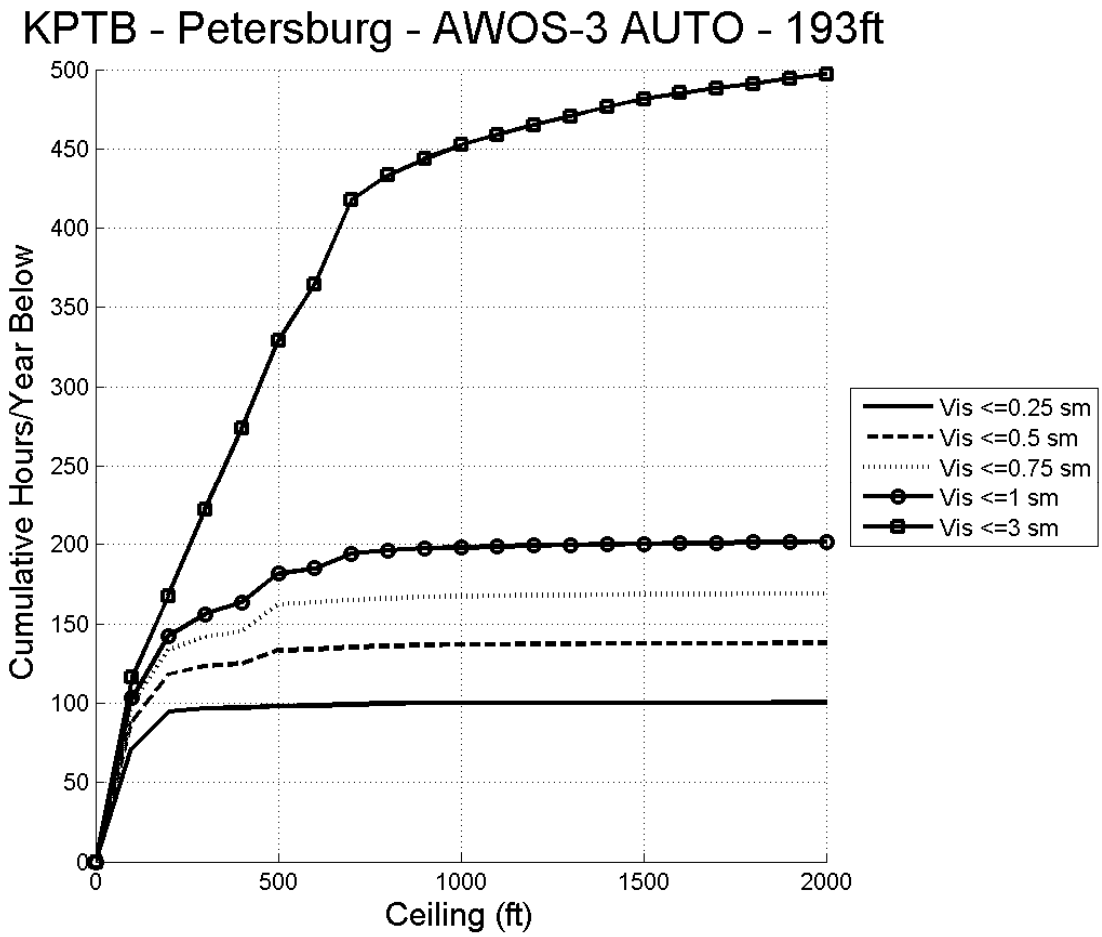
1500
2000
Vis <=0.25 sm
Vis <=0.5 sm
Vis <=0.75 sm
Vis <=1 sm
Vis <=3 sm


KPTB - Petersburg - AWOS-3 AUTO - 193ft
Cumulative Hours/Year Below
Ceiling (ft)
0
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200
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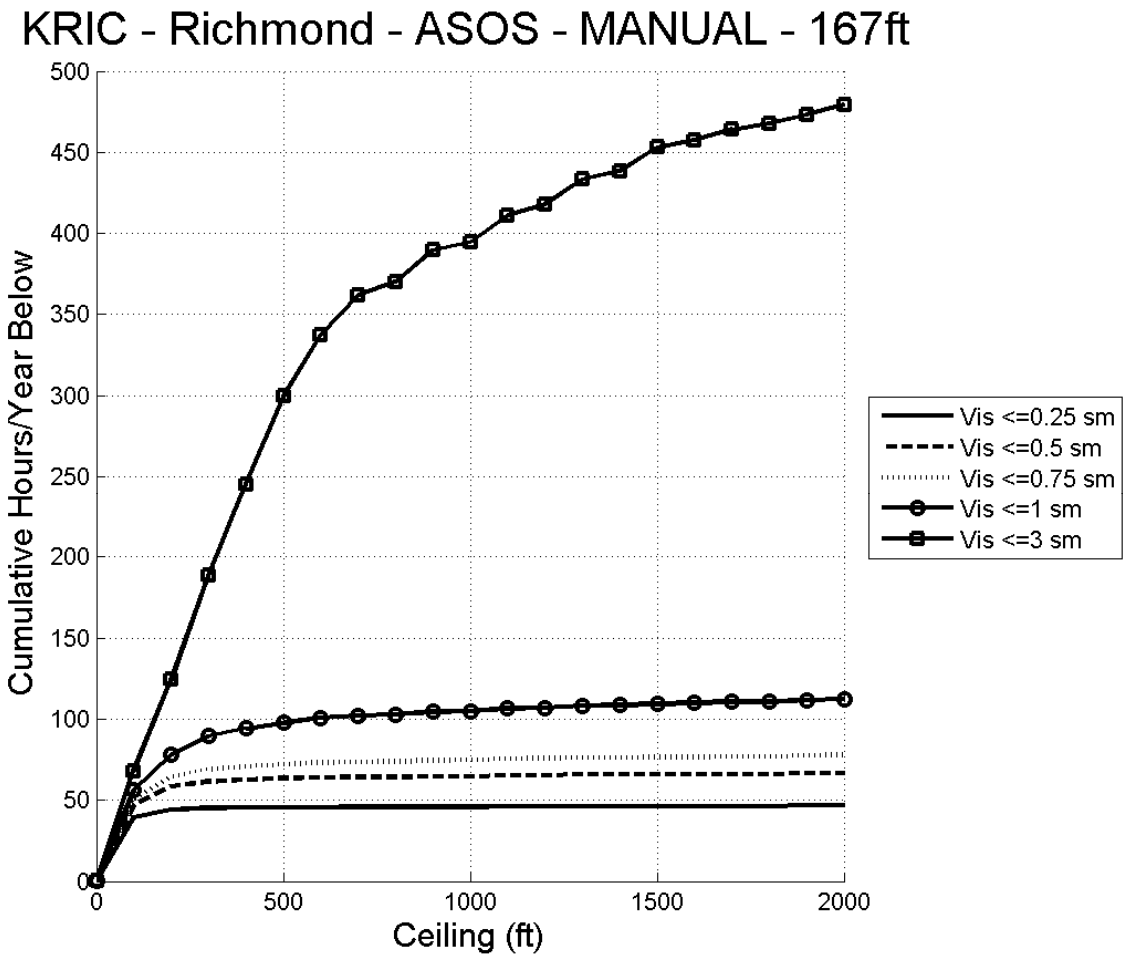
2000
Vis <=0.25 sm
Vis <=0.5 sm
Vis <=0.75 sm
Vis <=1 sm
Vis <=3 sm


KRIC - Richmond - ASOS - MANUAL - 167ft
Cumulative Hours/Year Below
Ceiling (ft)
0
50
100
150
200
250
300
350
400
450
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500
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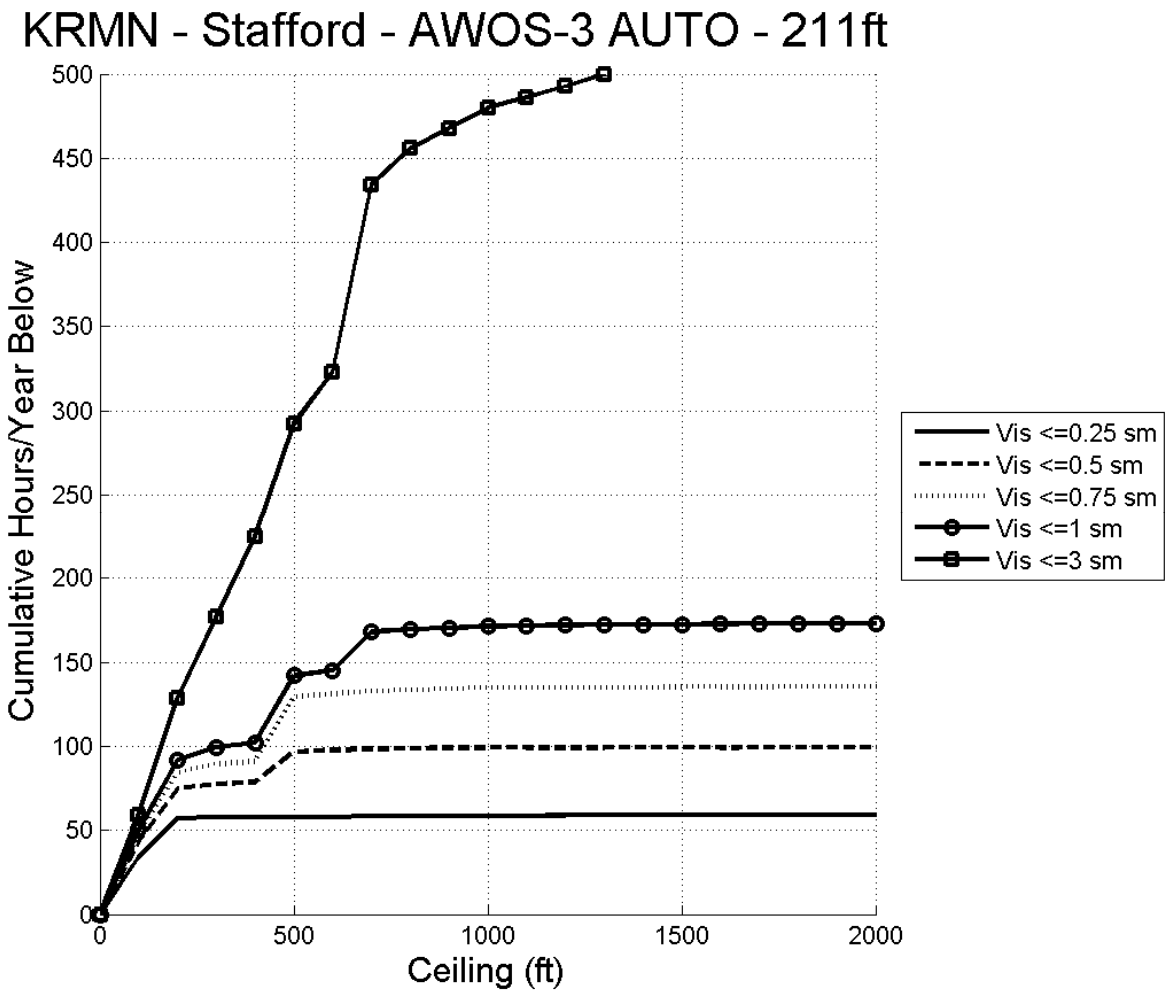
1500
2000
Vis <=0.25 sm
Vis <=0.5 sm
Vis <=0.75 sm
Vis <=1 sm
Vis <=3 sm


KRMN - Stafford - AWOS-3 AUTO - 211ft
Cumulative Hours/Year Below
Ceiling (ft)
0
50
100
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200
250
300
350
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450
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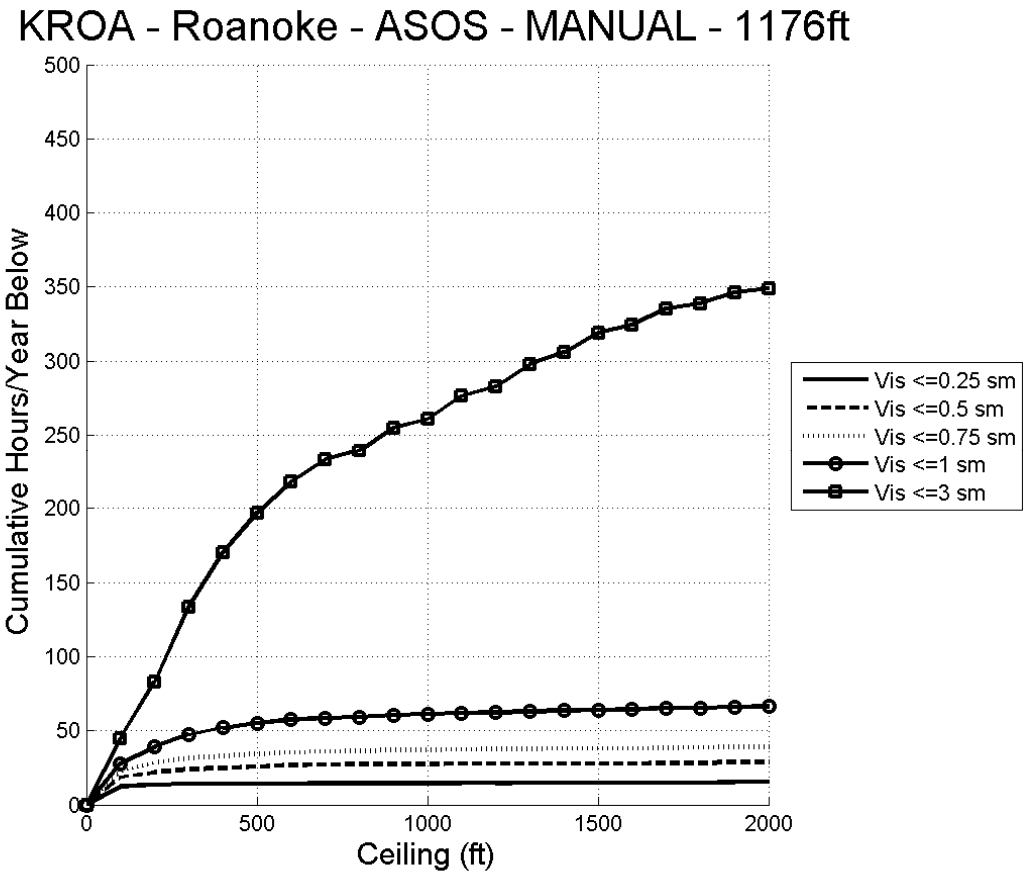
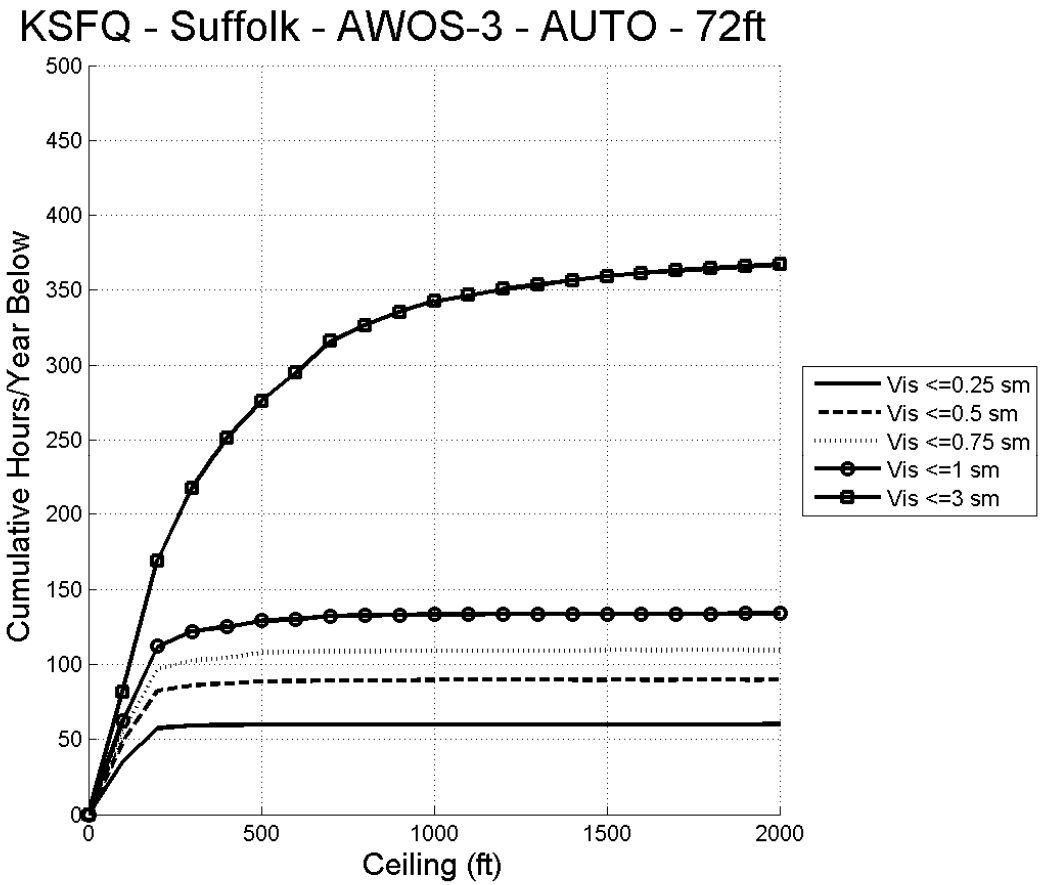
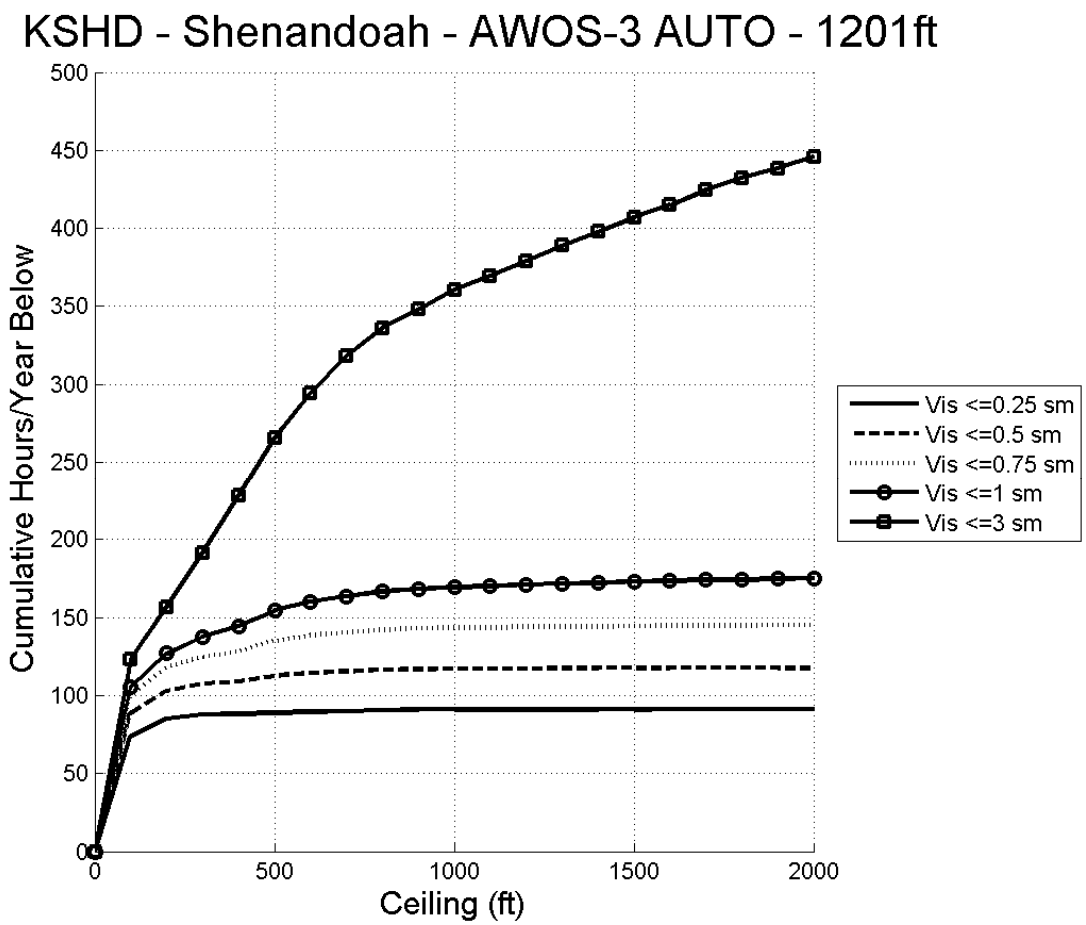
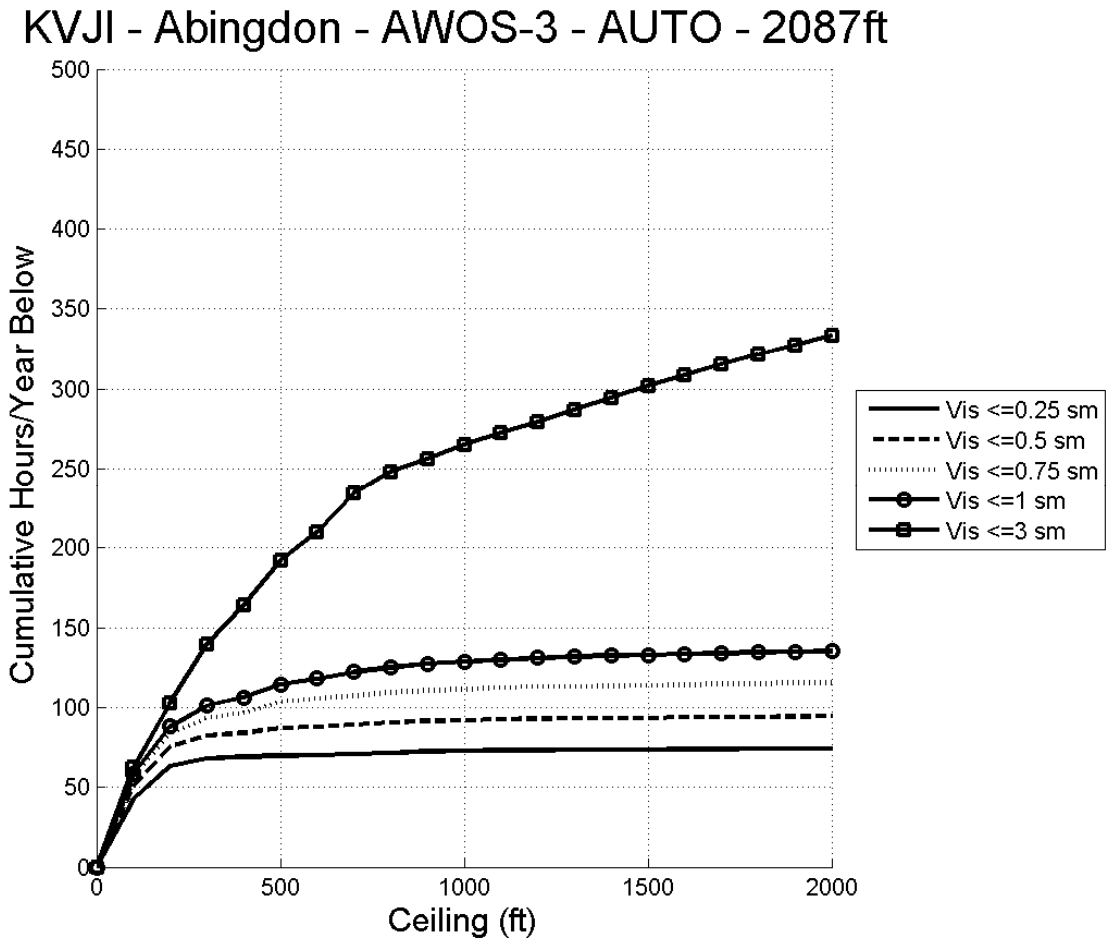
1000
1500
2000
Vis <=0.25 sm
Vis <=0.5 sm
Vis <=0.75 sm
Vis <=1 sm
Vis <=3 sm


KROA - Roanoke - ASOS - MANUAL - 1176ft
Cumulative Hours/Year Below
Ceiling (ft)
0
50
100
150
200
250
300
350
400
450
500
0
500
1000
1500
2000
Vis <=0.25 sm
Vis <=0.5 sm
Vis <=0.75 sm
Vis <=1 sm
Vis <=3 sm


KSFQ - Suffolk - AWOS-3 - AUTO - 72ft
Cumulative Hours/Year Below
Ceiling (ft)
0
50
100
150
200
250
300
350
400
450
500
0
500
1000
1500
2000
Vis <=0.25 sm
Vis <=0.5 sm
Vis <=0.75 sm
Vis <=1 sm
Vis <=3 sm


KSHD - Shenandoah - AWOS-3 AUTO - 1201ft
Cumulative Hours/Year Below
Ceiling (ft)
0
50
100
150
200
250
300
350
400
450
500
0
500
1000
1500
2000
Vis <=0.25 sm
Vis <=0.5 sm
Vis <=0.75 sm
Vis <=1 sm
Vis <=3 sm


KVJI - Abingdon - AWOS-3 - AUTO - 2087ft
Cumulative Hours/Year Below
Ceiling (ft)
0
50
100
150
200
250
300
350
400
450
500
0
500
1000
1500
2000
Vis <=0.25 sm
Vis <=0.5 sm
Vis <=0.75 sm
Vis <=1 sm
Vis <=3 sm

Appendix E – DETAILED ESTIMATES

The following tables summarize the estimated impacts and costs associated to airports which are recommended for visibility reductions below 1 mile. The advisory circular referenced is AC 150/5300-13 “Airport Design”.

Table E-1 - Accomack County Airport (MFV)
Runway 3 Visibility from 1 sm to ¾ sm

	Known Deficiencies	Additional Cost	Remarks
APPENDIX 16 (Table A16-1B)			
Height Above Touchdown (HAT)	none		
TERPS GQS	none		
TERPS W Surfaces	none		
TERPS Para 251	none		
Precision OFZ	none		
ALD	none		
Runway Length	none		
Runway Marking	none	$50,000	Upgrade to precision marking.
Hold Position Sign & Markings	none		
Runway Edge Lights	none		
Parallel Taxiway	Yes		To be completed with other development projects.
Approach Lights	Yes	$400,000	MALS.
OFZ	none		
Threshold Siting	none		
Airspace Analysis Survey	none		
		$450,000	

	Known Deficiencies	Additional Cost	Remarks
OTHER DESIGN STANDARDS			
Runway Separation	none		
RPZ (Table 2-4)	8 acres	$200,000	Expand RPZ to 1,700'x1,000'x1,510' (29.5 acres to 49 acres). The ALD shows that 41 acres are already owned in fee simple. An additional 8 acres is needed to own the entire RPZ in fee.
Runway Design (Table 3-3)	none		
Threshold Siting	none		
FAR PART 77			
Marking, easements, clearing	60 acres	$800,000	To be completed with other airport development. Easements reflect a 70' tree height.
		$1,000,000	

Source: Consultant analysis

Table E-2 - Charlottesville-Albemarle Airport (CHO)
Runway 3 Visibility from ½ sm to 2400 RVR

	Known Deficiencies	Additional Cost	Remarks
APPENDIX 16 (Table A16-1A)			
Height Above Touchdown (HAT)	none		
TERPS GQS	none		
TERPS W Surfaces	none		
TERPS Para 251	none		
Precision OFZ	none		
ALD	none		
Runway Length	none		
Runway Marking	none		
Hold Position Sign & Markings	none		
Runway Edge Lights	none		
Parallel Taxiway	none		
Approach Lights	none		
OFZ	none		
Threshold Siting	none		
Airspace Analysis Survey	none		
		$0	**RVR equipment is shown as a separate development item. Runway 3 is currently serviced with a full ILS and ½ sm minimums.**

	Known Deficiencies	Additional Cost	Remarks
OTHER DESIGN STANDARDS			
Runway Separation			
RPZ			
Runway Design			
Threshold Siting			
FAR PART 77			
Marking, easements, clearing			
		$0	

Source: Consultant analysis

Table E-3 - Charlottesville-Albemarle Airport (CHO)
Runway 21 Visibility from 1 sm to 2400 RVR

	Known Deficiencies	Additional Cost	Remarks
APPENDIX 16 (Table A16-1B)			
Height Above Touchdown (HAT)	none		
TERPS GQS	none		
TERPS W Surfaces	none		
TERPS Para 251	none		
Precision OFZ	none		
ALD	none		
Runway Length	none		
Runway Marking	Yes	$50,000	Upgrade marking to precision.
Hold Position Sign & Markings	none		
Runway Edge Lights	none		
Parallel Taxiway	none		
Approach Lights	Yes	$1,200,000	MALSR.
OFZ	none		
Threshold Siting	none		
Airspace Analysis Survey	none		
		$1,250,000	**RVR equipment is shown as a separate development item.**

	Known Deficiencies	Additional Cost	Remarks
OTHER DESIGN STANDARDS			
Runway Separation			
RPZ (Table 2-4)	10 acres	$500,000	10 additional acres for RPZ.
Runway Design			
Threshold Siting			
FAR PART 77			
Marking, easements, clearing	Yes	$100,000	Primary surface already 1,000'.
		$600,000	

Source: Consultant analysis

Table E-4 - Chesapeake Regional Airport (CPK)
Runway 23 Visibility from 1 sm to ¾ sm

	Known Deficiencies	Additional Cost	Remarks
APPENDIX 16 (Table A16-1B)			
Height Above Touchdown (HAT)	none		
TERPS GQS	none		
TERPS W Surfaces	none		
TERPS Para 251	none		
Precision OFZ	none		
ALD	none		
Runway Length	none		
Runway Marking	none	$50,000	Upgrade to precision marking.
Hold Position Sign & Markings	none		
Runway Edge Lights	none		
Parallel Taxiway	none		
Approach Lights	Yes	$400,000	MALS.
OFZ	none		
Threshold Siting	none		
Airspace Analysis Survey	none		
		$450,000	

	Known Deficiencies	Additional Cost	Remarks
OTHER DESIGN STANDARDS			
Runway Separation	none		
RPZ (Table 2-4)	3 acres	$100,000	Additional acreage outside existing airport property.
Runway Design (Table 3-3)	none		
Threshold Siting	none		
FAR PART 77			
Marking, easements, clearing	none		To be completed with other development projects. Clearing of existing Part 77 surfaces is underway. Part 77 primary surface is already 1,000' width.
		$100,000	

Source: Consultant analysis

Table E-5 - Chesterfield County Airport (FCI)
Runway 15 Visibility from 1 sm to ¾ sm

	Known Deficiencies	Additional Cost	Remarks
APPENDIX 16 (Table A16-1B)			
Height Above Touchdown (HAT)	none		
TERPS GQS	none		
TERPS W Surfaces	none		
TERPS Para 251	none		
Precision OFZ	none		
ALD	none		
Runway Length	none		
Runway Marking	none	$50,000	Upgrade to precision marking.
Hold Position Sign & Markings	none		
Runway Edge Lights	none		
Parallel Taxiway	none		
Approach Lights	Yes	$400,000	MALS.
OFZ	none		
Threshold Siting	none		
Airspace Analysis Survey	none		
		$450,000	

	Known Deficiencies	Additional Cost	Remarks
OTHER DESIGN STANDARDS			
Runway Separation	none		
RPZ	none		
Runway Design	none		
Threshold Siting	none		
FAR PART 77			
Marking, easements, clearing	none		Part 77 primary surface is already 1,000' width.
		$0	

Source: Consultant analysis

Table E-6 - Culpeper Regional Airport (CJR)
Runway 4 Visibility from 1 sm to ¾ sm

	Known Deficiencies	Additional Cost	Remarks
APPENDIX 16 (Table A16-1B)			
Height Above Touchdown (HAT)	none		
TERPS GQS	none		
TERPS W Surfaces	none		
TERPS Para 251	none		
Precision OFZ	none		
ALD	none		
Runway Length	none		
Runway Marking	none	$50,000	Upgrade to precision marking.
Hold Position Sign & Markings	none		
Runway Edge Lights	none		
Parallel Taxiway	none		
Approach Lights	Yes	$800,000	MALS or MALSR.
OFZ	none		
Threshold Siting	none		
Airspace Analysis Survey	none		
		$850,000	

	Known Deficiencies	Additional Cost	Remarks
OTHER DESIGN STANDARDS			
Runway Separation (Table 2-1)	none		Runway to taxiway and apron separation meets or exceeds Table 2-1 standards.
RPZ (Table 2-4)	39 acres	$1,900,000	The ALD shows that 20 acres of the 49 acre area already owned in fee simple. An additional 29 acres needed to own the entire RPZ in fee and an additional 10 acres due to adjacent property configuration.
Runway Design (Table 3-1)	none		Meets AC 150/5300-13 design standards for ¾ sm ARC B-II setbacks, OFZ (400') and OFA (500') requirements.
Threshold Siting	none		
FAR PART 77			
Marking, easements, clearing	10 acres	$200,000	Part 77 primary surface widens from 500' to 1,000'. Hangars and buildings remain marked penetrations to Part 77.
		$2,100,000	

Source: Consultant analysis

Table E-7 - Hampton Roads Executive Airport (PVG)
Runway 10 – New Runway – Visibility ½ sm

	Known Deficiencies	Additional Cost	Remarks
APPENDIX 16 (Table A16-1A)			
Height Above Touchdown (HAT)	Yes		New runway; to be completed with project.
TERPS GQS	Yes		New runway; to be completed with project.
TERPS W Surfaces	Yes		New runway; to be completed with project.
TERPS Para 251	Yes		New runway; to be completed with project.
Precision OFZ	Yes		New runway; to be completed with project.
ALD	none		
Runway Length	Yes		New runway; to be completed with project.
Runway Marking	Yes		New runway; to be completed with project.
Hold Position Sign & Markings	Yes		New runway; to be completed with project.
Runway Edge Lights	Yes		New runway; to be completed with project.
Parallel Taxiway	Yes		New runway; to be completed with project.
Approach Lights	Yes		New runway; to be completed with project.
OFZ	Yes		New runway; to be completed with project.
Threshold Siting	Yes		New runway; to be completed with project.
Airspace Analysis Survey	Yes		New runway; to be completed with project.
		$0	

	Known Deficiencies	Additional Cost	Remarks
OTHER DESIGN STANDARDS			
Runway Separation (Table 2-2)	none		New runway; to be completed with project.
RPZ (Table 2-4)	none		New runway; to be completed with project.
Runway Design (Table 3-3)	none		ALD shows the new runway to be constructed to ARC C-II design standards with ½ sm visibility. Existing Runway 10-28 to remain at 1 sm visibility minimums until replaced.
Threshold Siting	none		New runway; to be completed with project.
FAR PART 77			
Marking, easements, clearing	none		
		$0	

Source: Consultant analysis

Table E-8 - Hampton Roads Executive Airport (PVG)
Runway 28 – New Runway – Visibility from 1 sm to ¾ sm

	Known Deficiencies	Additional Cost	Remarks
APPENDIX 16 (Table A16-1B)			
Height Above Touchdown (HAT)	Yes		New runway; to be completed with project.
TERPS GQS	Yes		New runway; to be completed with project.
TERPS W Surfaces	Yes		New runway; to be completed with project.
TERPS Para 251	Yes		New runway; to be completed with project.
Precision OFZ	Yes		New runway; to be completed with project.
ALD	none		
Runway Length	Yes		New runway; to be completed with project.
Runway Marking	Yes		New runway; to be completed with project.
Hold Position Sign & Markings	Yes		New runway; to be completed with project.
Runway Edge Lights	Yes		New runway; to be completed with project.
Parallel Taxiway	Yes		New runway; to be completed with project.
Approach Lights	Yes	$400,000	MALS.
OFZ	Yes		New runway; to be completed with project.
Threshold Siting	Yes		New runway; to be completed with project.
Airspace Analysis Survey	Yes		New runway; to be completed with project.
		$400,000	

	Known Deficiencies	Additional Cost	Remarks
OTHER DESIGN STANDARDS			
Runway Separation (Table 2-2)	none		New runway; to be completed with project.
RPZ (Table 2-4)	2 acres	$100,000	New runway; to be completed with project.
Runway Design (Table 3-3)	none		ALD shows the new runway to be constructed to ARC C-II design standards with ½ sm visibility. Existing Runway 10-28 to remain at 1 sm visibility minimums until replaced.
Threshold Siting	none		New runway; to be completed with project.
FAR PART 77			
Marking, easements, clearing	none	$500,000	10 acres easements, 20 acres clearing.
		$600,000	

Source: Consultant analysis

Table E-9 - Hanover County Airport (OFP)
Runway 16 ILS with Visibility from 1 sm to ¾ sm

	Known Deficiencies	Additional Cost	Remarks
APPENDIX 16 (Table A16-1A)			
Height Above Touchdown (HAT)	none		
TERPS GQS	none		
TERPS W Surfaces	none		
TERPS Para 251	none		
Precision OFZ	none		
ALD	none		
Runway Length	none		
Runway Marking	none	$50,000	Upgrade to precision marking.
Hold Position Sign & Markings	none		
Runway Edge Lights	none		
Parallel Taxiway	none		
Approach Lights	Yes	$800,000	MALSR.
OFZ	none		
Threshold Siting	Yes	$200,000	
Airspace Analysis Survey	none		
		$1,050,000	

	Known Deficiencies	Additional Cost	Remarks
OTHER DESIGN STANDARDS			
Runway Separation (Table 2-2)	none		
RPZ (Table 2-4)	Yes	$10,000,000	
Runway Design (Table 3-1)	none		Meets AC 150/5300-13 design standards for ¾ sm ARC B-II setbacks, OFZ (400'), OFA (500') and safety area width (150').
Threshold Siting	none		
FAR PART 77			
Marking, easements, clearing	Yes	$1,000,000	Part 77 primary surface widens from 500' to 1,000'. Hangars and buildings remain marked penetrations to Part 77.
		$11,000,000	

Source: Consultant analysis

Table E-10 - Hanover County Airport (OFP)
Runway 16 ILS with Visibility from 1 sm to ½ sm

	Known Deficiencies	Additional Cost	Remarks
APPENDIX 16 (Table A16-1A)			
Height Above Touchdown (HAT)	none		
TERPS GQS	none		
TERPS W Surfaces	none		
TERPS Para 251	none		
Precision OFZ	none		
ALD	none		
Runway Length	none		
Runway Marking	Yes	$50,000	Upgrade to precision marking.
Hold Position Sign & Markings	none		
Runway Edge Lights	none		
Parallel Taxiway	none		
Approach Lights	Yes	$800,000	MALSR.
OFZ	none		
Threshold Siting	Yes	$200,000	
Airspace Analysis Survey	none		
		$1,050,000	

	Known Deficiencies	Additional Cost	Remarks
OTHER DESIGN STANDARDS			
Runway Separation (Table 2-2)	none		
RPZ (Table 2-4)	Yes	$10,000,000	
Runway Design (Table 3-2)	Yes	$9,000,000	Meets AC 150/5300-13 design standards for 1/2 sm ARC B-II setbacks, OFZ (400'), OFA (800') and safety area width (300').
Threshold Siting	none		
FAR PART 77			
Marking, easements, clearing	Yes	$1,000,000	Part 77 primary surface widens from 500' to 1,000'. Hangars and buildings remain marked penetrations to Part 77.
		$20,000,000	**Or $9.0 million if ¾ sm improvements already completed.**

Source: Consultant analysis

Table E-11 - Hanover County Airport (OFP)
Runway 34 ILS with Visibility from 1 sm to ¾ sm

	Known Deficiencies	Additional Cost	Remarks
APPENDIX 16 (Table A16-1A)			
Height Above Touchdown (HAT)	none		
TERPS GQS	none		
TERPS W Surfaces	none		
TERPS Para 251	none		
Precision OFZ	none		
ALD	none		
Runway Length	none		
Runway Marking	none	$50,000	Upgrade to precision marking.
Hold Position Sign & Markings	none		
Runway Edge Lights	none		
Parallel Taxiway	none		
Approach Lights	Yes	$400,000	MALS.
OFZ	none		
Threshold Siting	none		
Airspace Analysis Survey	none		
		$450,000	

	Known Deficiencies	Additional Cost	Remarks
OTHER DESIGN STANDARDS			
Runway Separation (Table 2-2)	none		
RPZ (Table 2-4)	25 acres	$1,250,000	
Runway Design (Table 3-3)	none		Meets AC 150/5300-13 design standards for ¾ sm ARC B-II setbacks, OFZ (400'), OFA (500') and safety area width (150').
Threshold Siting	none		
FAR PART 77			
Marking, easements, clearing	Yes	$150,000	Part 77 primary surface will be 1,000' with upgrade to Runway 16 approach minimums. Hangars and buildings remain marked penetrations to Part 77.
		$1,400,000	

Source: Consultant analysis

Table E-12 - Ingalls Field (HSP)
Runway 25 Visibility from 1 sm to 4000 RVR

	Known Deficiencies	Additional Cost	Remarks
APPENDIX 16 (Table A16-1A)			
Height Above Touchdown (HAT)	none		
TERPS GQS	none		
TERPS W Surfaces	none		
TERPS Para 251	none		
Precision OFZ	none		
ALD	none		
Runway Length	none		
Runway Marking	none		
Hold Position Sign & Markings	none		
Runway Edge Lights	none		
Parallel Taxiway	none		
Approach Lights	Yes		Not obtainable.
OFZ	none		
Threshold Siting	none		
Airspace Analysis Survey	none		To be completed with other airport improvements.
		$0	

	Known Deficiencies	Additional Cost	Remarks
OTHER DESIGN STANDARDS			
Runway Separation (Table 2-2)	none		
RPZ (Table 2-4)	24 acres	$360,000	The ALD shows that 5.5 acres of the 29.5 acres are already owned in fee simple. An additional 24 acres are needed to own the entire RPZ in fee.
Runway Design (Table 3-1)	none		
Threshold Siting	none		
FAR PART 77			
Marking, easements, clearing	none		
		$360,000	

Source: Consultant analysis

Table E-13 - Leesburg Executive Airport (JYO)
Runway 17 ILS Visibility from 1 sm to ¾ sm

	Known Deficiencies	Additional Cost	Remarks
APPENDIX 16 (Table A16-1A)			
Height Above Touchdown (HAT)	none		
TERPS GQS	none		
TERPS W Surfaces	none		
TERPS Para 251	none		
Precision OFZ	none		
ALD	none		
Runway Length	none		
Runway Marking	none	$50,000	Upgrade to precision marking.
Hold Position Sign & Markings	none		
Runway Edge Lights	none		
Parallel Taxiway	none		
Approach Lights	Yes	$800,000	MALSR.
OFZ	none		
Threshold Siting	none		
Airspace Analysis Survey	none		
		$850,000	

	Known Deficiencies	Additional Cost	Remarks
OTHER DESIGN STANDARDS			
Runway Separation (Table 2-2)	none		300' runway to parallel taxiway; 400' to aircraft parking; corrections being completed with other development.
RPZ (Table 2-4)	30 acres	$4,500,000	
Runway Design (Table 3-3)	none		OFA (800') corrections completed with other development projects.
Threshold Siting	none		
FAR PART 77			
Marking, easements, clearing	Yes	$1,000,000	Part 77 primary surface widens from 500' to 1,000'. Hangars and buildings remained marked penetrations to Part 77.
		$5,500,000	

Source: Consultant analysis

Table E-14 - Leesburg Executive Airport (JYO)
Runway 17 ILS Visibility from 1 sm to ½ sm

	Known Deficiencies	Additional Cost	Remarks
APPENDIX 16 (Table A16-1A)			
Height Above Touchdown (HAT)	none		
TERPS GQS	none		
TERPS W Surfaces	none		
TERPS Para 251	none		
Precision OFZ	none		
ALD	none		
Runway Length	none		
Runway Marking	Yes	$50,000	Upgrade to precision marking.
Hold Position Sign & Markings	none		
Runway Edge Lights	none		
Parallel Taxiway	none		
Approach Lights	Yes	$800,000	MALSR.
OFZ	none		
Threshold Siting	none		
Airspace Analysis Survey	none		Completed with other airport development.
		$850,000	

	Known Deficiencies	Additional Cost	Remarks
OTHER DESIGN STANDARDS			
Runway Separation (Table 2-2)	Yes	$20,000,000	400' runway to parallel taxiway; 500' to aircraft parking.
RPZ (Table 2-4)	60 acres	$9,000,000	
Runway Design (Table 3-3)	none		OFA (800') corrections completed with other development projects.
Threshold Siting	none		
FAR PART 77			
Marking, easements, clearing	Yes	$1,000,000	Part 77 primary surface widens from 500' to 1,000'. Hangars and buildings remained marked penetrations to Part 77.
		$30,000,000	**Or $25.5 million with ¾ sm improvements already completed.**

Source: Consultant analysis

Table E-15 - Leesburg Executive Airport (JYO)
Runway 35 ILS Visibility from 1 sm to ¾ sm

	Known Deficiencies	Additional Cost	Remarks
APPENDIX 16 (Table A16-1A)			
Height Above Touchdown (HAT)	none		
TERPS GQS	none		
TERPS W Surfaces	none		
TERPS Para 251	none		
Precision OFZ	none		
ALD	none		
Runway Length	none		
Runway Marking	none	$50,000	Upgrade to precision marking.
Hold Position Sign & Markings	none		
Runway Edge Lights	none		
Parallel Taxiway	none		
Approach Lights	Yes	$400,000	MALS.
OFZ	none		
Threshold Siting	none		
Airspace Analysis Survey	none		
		$450,000	

	Known Deficiencies	Additional Cost	Remarks
OTHER DESIGN STANDARDS			
Runway Separation (Table 2-2)	none		300' runway to parallel taxiway; 400' to aircraft parking; corrections being completed with other development.
RPZ (Table 2-4)	30 acres	$4,500,000	RPZ increases to 1,000' x 1,000' x 1,510'.
Runway Design (Table 3-3)	none		OFA (800') corrections completed with other development projects.
Threshold Siting	none		
FAR PART 77			
Marking, easements, clearing	Yes	$1,000,000	Part 77 primary surface will be 1,000' with upgrade to Runway 17 approach minimums. Hangars and buildings remained marked penetrations to Part 77.
		$5,500,000	

Source: Consultant analysis

Table E-16 - Lonesome Pine Airport (LNP)
Runway 24 ILS Visibility from 1 sm to ½ sm

	Known Deficiencies	Additional Cost	Remarks
APPENDIX 16 (Table A16-1A)			
Height Above Touchdown (HAT)	none		
TERPS GQS	none		
TERPS W Surfaces	none		
TERPS Para 251	none		
Precision OFZ	none		
ALD	none		
Runway Length	none		
Runway Marking	Yes	$50,000	Upgrade to precision marking.
Hold Position Sign & Markings	none		
Runway Edge Lights	none		
Parallel Taxiway	Yes		To be completed with other airport development.
Approach Lights	Yes	$1,250,000	MALSR.
OFZ	none		
Threshold Siting	none		
Airspace Analysis Survey	none		
		$1,300,000	

	Known Deficiencies	Additional Cost	Remarks
OTHER DESIGN STANDARDS			
Runway Separation (Table 2-2)	none		
RPZ (Table 2-4)	23 acres	$713,000	The ALD shows that 56 acres of the 79 acres are already owned in fee simple. An additional 23 acres are needed to own the entire RPZ in fee.
Runway Design (Table 3-3)	none		
Threshold Siting	none		
FAR PART 77			
Marking, easements, clearing	Yes	$1,129,000	Primary surface widens from 500' to 1,000', 81 acres of easements, 40 acres of clearing.
		$1,842,000	

Source: Consultant analysis

Table E-17 - Lynchburg Regional Airport (LYH)
Runway 22 Visibility from 1 sm to ¾ sm

	Known Deficiencies	Additional Cost	Remarks
APPENDIX 16 (Table A16-1B)			
Height Above Touchdown (HAT)	none		
TERPS GQS	none		
TERPS W Surfaces	none		
TERPS Para 251	none		
Precision OFZ	none		
ALD	none		
Runway Length	none		
Runway Marking	none	$50,000	Upgrade marking to precision.
Hold Position Sign & Markings	none		
Runway Edge Lights	none		
Parallel Taxiway	none		
Approach Lights	Yes	$600,000	MALS.
OFZ	none		
Threshold Siting	none		
Airspace Analysis Survey	none		
		$650,000	

	Known Deficiencies	Additional Cost	Remarks
OTHER DESIGN STANDARDS			
Runway Separation (Table 2-2)	none		
RPZ (Table 2-4)	none		
Runway Design (Table 3-3)	none		
Threshold Siting	none		
FAR PART 77			
Marking, easements, clearing	Yes	$900,000	Part 77 primary surface is already 1,000' width.
		$900,000	

Source: Consultant analysis

Table E-18 - Manassas Regional Airport (HEF)
Runway 34R Visibility from 1 sm to ¾ sm

	Known Deficiencies	Additional Cost	Remarks
APPENDIX 16 (Table A16-1B)			
Height Above Touchdown (HAT)	none		
TERPS GQS	none		
TERPS W Surfaces	none		
TERPS Para 251	none		
Precision OFZ	none		
ALD	none		
Runway Length	none		
Runway Marking	none	$50,000	Upgrade marking to precision.
Hold Position Sign & Markings	none		
Runway Edge Lights	none		
Parallel Taxiway	none		
Approach Lights	Yes	$400,000	MALS.
OFZ	none		
Threshold Siting	none		
Airspace Analysis Survey	none		
		$450,000	

	Known Deficiencies	Additional Cost	Remarks
OTHER DESIGN STANDARDS			
Runway Separation (Table 2-2)	none		
RPZ (Table 2-4)	none		
Runway Design (Table 3-3)	none		
Threshold Siting	none		
FAR PART 77			
Marking, easements, clearing	20 acres	$400,000	Part 77 primary surface is already 1,000' width.
		$400,000	

Source: Consultant analysis

Table E-19 - Middle Peninsula Regional (FYJ)
Runway 10 Visibility from 1 sm to ¾ sm

	Known Deficiencies	Additional Cost	Remarks
APPENDIX 16 (Table A16-1B)			
Height Above Touchdown (HAT)	none		
TERPS GQS	none		
TERPS W Surfaces	none		
TERPS Para 251	none		
Precision OFZ	none		
ALD	none		
Runway Length	none		
Runway Marking	none	$50,000	Upgrade to precision marking.
Hold Position Sign & Markings	none		
Runway Edge Lights	none		
Parallel Taxiway	Yes		To be completed with other airport development.
Approach Lights	none	$400,000	MALS.
OFZ	none		
Threshold Siting	none		
Airspace Analysis Survey	none		
		$450,000	

	Known Deficiencies	Additional Cost	Remarks
OTHER DESIGN STANDARDS			
Runway Separation (Table 2-1)	none		
RPZ (Table 2-4)	38 acres	$400,000	The ALD shows 11 acres of the 49 acres are already owned in fee simple. An additional 38 acres is needed to own the entire RPZ in fee.
Runway Design (Table 3-1)	none		
Threshold Siting	none		
FAR PART 77			
Marking, easements, clearing	30 acres	$300,000	Part 77 primary surface widens from 500' to 1,000'.
		$700,000	

Source: Consultant analysis

Table E-20 - New River Valley (PSK)
Runway 6 ILS Visibility from 1 sm to ½ sm

	Known Deficiencies	Additional Cost	Remarks
APPENDIX 16 (Table A16-1A)			
Height Above Touchdown (HAT)	none		
TERPS GQS	none		
TERPS W Surfaces	none		
TERPS Para 251	none		
Precision OFZ	none		
ALD	none		
Runway Length	none		
Runway Marking	none		
Hold Position Sign & Markings	none		
Runway Edge Lights	none		
Parallel Taxiway	Yes		To be completed with other airport development.
Approach Lights	none		Re-evaluate to obtain credit for existing MALSR.
OFZ	none		
Threshold Siting	none		
Airspace Analysis Survey	none		To be completed with other airport development.
		$0	

	Known Deficiencies	Additional Cost	Remarks
OTHER DESIGN STANDARDS			
Runway Separation (Table 2-2)	none		
RPZ (Table 2-4)	20 acres	$500,000	The ALD shows that 59 acres of the 79 acres are already owned in fee simple. An additional 20 acres are needed to own the entire RPZ in fee.
Runway Design (Table 3-3)	none		
Threshold Siting	none		
FAR PART 77			
Marking, easements, clearing	Yes	$2,300,000	Part 77 primary surface is already 1,000' width.
		$2,800,000	

Source: Consultant analysis

Table E-21 - Newport News-Williamsburg International Airport (PHF)
Runway 7 Visibility from 2400 RVR to 1200 RVR

	Known Deficiencies	Additional Cost	Remarks
APPENDIX 16 (Table A16-1A)			
Height Above Touchdown (HAT)	none		
TERPS GQS	none		
TERPS W Surfaces	none		
TERPS Para 251	none		
Precision OFZ	none		
ALD	none		
Runway Length	none		
Runway Marking	none		
Hold Position Sign & Markings	none		
Runway Edge Lights	none		
Parallel Taxiway	none		
Approach Lights	Yes		ALSF-2 required; shown as separate development item.
OFZ	none		
Threshold Siting	none		
Airspace Analysis Survey	none		
		$0	**RVR equipment, CL and TDZ lights shown as a separate development items.**

	Known Deficiencies	Additional Cost	Remarks
OTHER DESIGN STANDARDS			
Runway Separation (Table 2-2)	none		
RPZ (Table 2-4)	none		
Runway Design (Table 3-3)	none		
Threshold Siting	none		
FAR PART 77			
Marking, easements, clearing	Yes	$1,000,000	
		$1,000,000	**Runway 7 is currently serviced with a full ILS and 2400 RVR minimums.**

Source: Consultant analysis

Table E-22 - Newport News-Williamsburg International Airport (PHF)
Runway 25 Visibility from ¾ sm to 1200 RVR

	Known Deficiencies	Additional Cost	Remarks
APPENDIX 16 (Table A16-1A)			
Height Above Touchdown (HAT)	none		
TERPS GQS	none		
TERPS W Surfaces	none		
TERPS Para 251	none		
Precision OFZ	none		
ALD	none		
Runway Length	none		
Runway Marking	none		
Hold Position Sign & Markings	none		
Runway Edge Lights	none		
Parallel Taxiway	none		
Approach Lights	Yes	$1,250,000	MALSR.
OFZ	none		
Threshold Siting	none		
Airspace Analysis Survey	none		
		$1,250,000	**RVR equipment, CL and TDZ lights shown as a separate development items.**

	Known Deficiencies	Additional Cost	Remarks
OTHER DESIGN STANDARDS			
Runway Separation (Table 2-2)	none		
RPZ (Table 2-4)	none		
Runway Design (Table 3-3)	none		
Threshold Siting	none		
FAR PART 77			
Marking, easements, clearing	Yes	$500,000	
		$500,000	**Runway 25 is currently serviced with a full ILS and ¾ sm minimums.**

Source: Consultant analysis

Table E-23 - Newport News-Williamsburg International Airport (PHF)
Runway 20 Visibility from 1 sm to ¾ sm

	Known Deficiencies	Additional Cost	Remarks
APPENDIX 16 (Table A16-1B)			
Height Above Touchdown (HAT)	none		
TERPS GQS	none		
TERPS W Surfaces	none		
TERPS Para 251	none		
Precision OFZ	none		
ALD	none		
Runway Length	none		
Runway Marking	none	$50,000	Upgrade to precision markings.
Hold Position Sign & Markings	none		
Runway Edge Lights	none		
Parallel Taxiway	none		
Approach Lights	Yes	$600,000	MALS.
OFZ	none		
Threshold Siting	none		
Airspace Analysis Survey	none		
		$650,000	

	Known Deficiencies	Additional Cost	Remarks
OTHER DESIGN STANDARDS			
Runway Separation (Table 2-2)	none		
RPZ (Table 2-4)	none	$1,000,000	
Runway Design (Table 3-3)	none		
Threshold Siting	none		
FAR PART 77			
Marking, easements, clearing	Yes	$3,000,000	
		$4,000,000	

Source: Consultant analysis

Table E-24 - Richmond International Airport (RIC)
Runway 2 Visibility from ¾ sm to 2400 RVR

	Known Deficiencies	Additional Cost	Remarks
APPENDIX 16 (Table A16-1A)			
Height Above Touchdown (HAT)	none		
TERPS GQS	none		
TERPS W Surfaces	none		
TERPS Para 251	none		
Precision OFZ	none		
ALD	none		
Runway Length	none		
Runway Marking	none		
Hold Position Sign & Markings	none		
Runway Edge Lights	none		
Parallel Taxiway	none		
Approach Lights	none		
OFZ	none		
Threshold Siting	none		
Airspace Analysis Survey	none		
		$0	**RVR equipment is shown as a separate development item.**

	Known Deficiencies	Additional Cost	Remarks
OTHER DESIGN STANDARDS			
Runway Separation (Table 2-2)	none		
RPZ (Table 2-4)	none		
Runway Design (Table 3-3)	none		
Threshold Siting	none		
FAR PART 77			
Marking, easements, clearing	none		To be completed with other airport development.
		$0	**Runway 2 is currently serviced with a full ILS and ¾ sm minimums.**

Source: Consultant analysis

Table E-25 - Richmond International Airport (RIC)
Runway 16 Visibility from 2400 RVR to 1800 RVR

	Known Deficiencies	Additional Cost	Remarks
APPENDIX 16 (Table A16-1A)			
Height Above Touchdown (HAT)	none		
TERPS GQS	none		
TERPS W Surfaces	none		
TERPS Para 251	none		
Precision OFZ	none		
ALD	none		
Runway Length	none		
Runway Marking	none		
Hold Position Sign & Markings	none		
Runway Edge Lights	none		
Parallel Taxiway	none		
Approach Lights	none		
OFZ	none		
Threshold Siting	none		
Airspace Analysis Survey	none		
		$0	**TDZ lights are shown as a separate development item.**

	Known Deficiencies	Additional Cost	Remarks
OTHER DESIGN STANDARDS			
Runway Separation (Table 2-2)	none		
RPZ (Table 2-4)	none		
Runway Design (Table 3-3)	none		
Threshold Siting	none		
FAR PART 77			
Marking, easements, clearing	none		To be completed with other airport development.
		$0	**Runway 16 is currently serviced with a full ILS and 2400 RVR minimums.**

Source: Consultant analysis

Table E-26 - Richmond International Airport (RIC)
Runway 20 Visibility from ¾ sm to ½ sm

	Known Deficiencies	Additional Cost	Remarks
APPENDIX 16 (Table A16-1A)			
Height Above Touchdown (HAT)	none		
TERPS GQS	none		
TERPS W Surfaces	none		
TERPS Para 251	none		
Precision OFZ	none		
ALD	none		
Runway Length	none		
Runway Marking	none		
Hold Position Sign & Markings	none		
Runway Edge Lights	none		
Parallel Taxiway	none		
Approach Lights	Yes	$1,250,000	
OFZ	none		
Threshold Siting	none		
Airspace Analysis Survey	none		
		$1,250,000	

	Known Deficiencies	Additional Cost	Remarks
OTHER DESIGN STANDARDS			
Runway Separation (Table 2-2)	none		
RPZ (Table 2-4)	none		
Runway Design (Table 3-3)	none		
Threshold Siting	none		
FAR PART 77			
Marking, easements, clearing	none	$500,000	Part 77 primary surface is already 1,000' width.
		$500,000	

Source: Consultant analysis

Table E-27 - Norfolk International Airport (ORF)
Runway 5 Visibility from 1800 RVR to 0 RVR

	Known Deficiencies	Additional Cost	Remarks
APPENDIX 16 (Table A16-1A)			
Height Above Touchdown (HAT)	none		
TERPS GQS	none		
TERPS W Surfaces	none		
TERPS Para 251	none		
Precision OFZ	none		
ALD	none		
Runway Length	none		
Runway Marking	none		
Hold Position Sign & Markings	none		
Runway Edge Lights	none		
Parallel Taxiway	none		
Approach Lights	Yes		ALSF-2 required; shown as separate development item.
OFZ	none		
Threshold Siting	none		
Airspace Analysis Survey	none		
		$0	**RVR equipment is shown as a separate development item.**

	Known Deficiencies	Additional Cost	Remarks
OTHER DESIGN STANDARDS			
Runway Separation (Table 2-2)	none		
RPZ (Table 2-4)	none		
Runway Design (Table 3-3)	none		
Threshold Siting	none		
FAR PART 77			
Marking, easements, clearing	none	$1,000,000	
		$1,000,000	**Runway 5 is currently serviced with a full ILS and 1800 RVR minimums.**

Source: Consultant analysis

Table E-28 - Norfolk International Airport (ORF)
Runway 23 Visibility from ¾ sm to 1800 RVR

	Known Deficiencies	Additional Cost	Remarks
APPENDIX 16 (Table A16-1A)			
Height Above Touchdown (HAT)	none		
TERPS GQS	none		
TERPS W Surfaces	none		
TERPS Para 251	none		
Precision OFZ	none		
ALD	none		
Runway Length	none		
Runway Marking	none		
Hold Position Sign & Markings	none		
Runway Edge Lights	none		
Parallel Taxiway	none		
Approach Lights	none		Threshold and MALSR relocation required; shown as separate development items.
OFZ	none		
Threshold Siting	none		
Airspace Analysis Survey	none		
		$0	**RVR equipment and TDZ lights are shown as a separate development item.**

	Known Deficiencies	Additional Cost	Remarks
OTHER DESIGN STANDARDS			
Runway Separation (Table 2-2)	none		
RPZ (Table 2-4)	none		
Runway Design (Table 3-3)	none		
Threshold Siting	none		
FAR PART 77			
Marking, easements, clearing	none		
		$0	**Runway 23 is currently serviced with a full ILS and ¾ sm minimums.**

Source: Consultant analysis

Table E-29 - Roanoke Regional Airport (ROA)
Runway 6 Visibility from ¾ sm to 2400 RVR

	Known Deficiencies	Additional Cost	Remarks
APPENDIX 16 (Table A16-1B)			
Height Above Touchdown (HAT)	none		
TERPS GQS	none		
TERPS W Surfaces	none		
TERPS Para 251	none		
Precision OFZ	none		
ALD	none		
Runway Length	none		
Runway Marking	none		
Hold Position Sign & Markings	none		
Runway Edge Lights	none		
Parallel Taxiway	none		
Approach Lights	none		
OFZ	none		
Threshold Siting	none		
Airspace Analysis Survey	none		
		$0	**RVR equipment is shown as a separate development item.**

	Known Deficiencies	Additional Cost	Remarks
OTHER DESIGN STANDARDS			
Runway Separation (Table 2-2)	none		
RPZ (Table 2-4)	45 acres	$2,250,000	
Runway Design (Table 3-3)	none		
Threshold Siting	none		
FAR PART 77			
Marking, easements, clearing	none		
		$2,250,000	**Runway 6 is currently serviced with a LDA with GS and ¾ sm minimums.**

Source: Consultant analysis

Table E-30 - Roanoke Regional Airport (ROA)
Runway 33 Visibility from ½ sm to 2400 RVR

	Known Deficiencies	Additional Cost	Remarks
APPENDIX 16 (Table A16-1A)			
Height Above Touchdown (HAT)	none		
TERPS GQS	none		
TERPS W Surfaces	none		
TERPS Para 251	none		
Precision OFZ	none		
ALD	none		
Runway Length	none		
Runway Marking	none		
Hold Position Sign & Markings	none		
Runway Edge Lights	none		
Parallel Taxiway	none		
Approach Lights	none		
OFZ	none		
Threshold Siting	none		
Airspace Analysis Survey	none		
		$0	**RVR equipment is shown as a separate development item.**

	Known Deficiencies	Additional Cost	Remarks
OTHER DESIGN STANDARDS			
Runway Separation (Table 2-2)	none		
RPZ (Table 2-4)	none		To be completed with other airport development; significant RPZ land acquisition project currently underway for existing RPZ.
Runway Design (Table 3-3)	none		
Threshold Siting	none		
FAR PART 77			
Marking, easements, clearing	none		To be completed with other airport development.
		$0	**Runway 33 is currently serviced with an ILS and ½ sm minimums.**

Source: Consultant analysis

Table E-31- Shenandoah Valley Regional Airport (SHD)
Runway 5 Visibility from ½ sm to 2400 RVR

	Known Deficiencies	Additional Cost	Remarks
APPENDIX 16 (Table A16-1A)			
Height Above Touchdown (HAT)	none		
TERPS GQS	none		
TERPS W Surfaces	none		
TERPS Para 251	none		
Precision OFZ	none		
ALD	none		
Runway Length	none		
Runway Marking	none		
Hold Position Sign & Markings	none		
Runway Edge Lights	none		
Parallel Taxiway	none		
Approach Lights	none		
OFZ	none		
Threshold Siting	none		
Airspace Analysis Survey	none		
		$0	**RVR equipment is shown as a separate development item.**

	Known Deficiencies	Additional Cost	Remarks
OTHER DESIGN STANDARDS			
Runway Separation (Table 2-2)	none		
RPZ (Table 2-4)	none		
Runway Design (Table 3-3)	none		
Threshold Siting	none		
FAR PART 77			
Marking, easements, clearing	none		
		$0	**Runway 5 is currently serviced with a full ILS and ½ sm minimums.**

Source: Consultant analysis

Table E-32 - Shenandoah Valley Regional Airport (SHD)
Runway 23 Visibility from 1 sm to ½ sm

	Known Deficiencies	Additional Cost	Remarks
APPENDIX 16 (Table A16-1B)			
Height Above Touchdown (HAT)	none		
TERPS GQS	none		
TERPS W Surfaces	none		
TERPS Para 251	none		
Precision OFZ	none		
ALD	none		
Runway Length	none		
Runway Marking	none		
Hold Position Sign & Markings	none		
Runway Edge Lights	none		
Parallel Taxiway	none		
Approach Lights	none		
OFZ	none		
Threshold Siting	none		
Airspace Analysis Survey	none		
		$0	

	Known Deficiencies	Additional Cost	Remarks
OTHER DESIGN STANDARDS			
Runway Separation (Table 2-2)	none		
RPZ (Table 2-4)	10 acres	$500,000	
Runway Design (Table 3-3)	none		
Threshold Siting	none		
FAR PART 77			
Marking, easements, clearing	none		Part 77 primary surface is already 1,000' width.
		$500,000	

Source: Consultant analysis

Table E-33 - Stafford Regional Airport (RMN)
Runway 33 Visibility from ¾ sm to ½ sm

	Known Deficiencies	Additional Cost	Remarks
APPENDIX 16 (Table A16-1A)			
Height Above Touchdown (HAT)	none		
TERPS GQS	none		
TERPS W Surfaces	none		
TERPS Para 251	none		
Precision OFZ	none		
ALD	none		
Runway Length	none		
Runway Marking	none		
Hold Position Sign & Markings	none		
Runway Edge Lights	none		
Parallel Taxiway	none		
Approach Lights	Yes	$600,000	Upgrade MALS to MALSR.
OFZ	none		
Threshold Siting	none	$300,000	Obstruction removal to 34:1 slope.
Airspace Analysis Survey	none		
		$900,000	

	Known Deficiencies	Additional Cost	Remarks
OTHER DESIGN STANDARDS			
Runway Separation (Table 2-2)	none		
RPZ (Table 2-4)	10 acres	$500,000	
Runway Design (Table 3-3)	none		
Threshold Siting	none		
FAR PART 77			
Marking, easements, clearing	40 acres	$1,650,000	35 acres of easements; 40 acres of clearing; Part 77 primary surface is already 1,000' width.
		$2,150,000	**Runway 33 is currently serviced with an ILS with ¾ sm minimums.**

Source: Consultant analysis

Table E-34 - Stafford Regional Airport (RMN)
Runway 15 Visibility from 1 sm to ¾ sm

	Known Deficiencies	Additional Cost	Remarks
APPENDIX 16 (Table A16-1B)			
Height Above Touchdown (HAT)	none		
TERPS GQS	none		
TERPS W Surfaces	none		
TERPS Para 251	none		
Precision OFZ	none		
ALD	none		
Runway Length	none		
Runway Marking	none	$50,000	Upgrade to precision markings.
Hold Position Sign & Markings	none		
Runway Edge Lights	none		
Parallel Taxiway	none		
Approach Lights	Yes	$400,000	MALS.
OFZ	none		
Threshold Siting	none		
Airspace Analysis Survey	none		
		$450,000	

	Known Deficiencies	Additional Cost	Remarks
OTHER DESIGN STANDARDS			
Runway Separation (Table 2-2)	none		
RPZ (Table 2-4)	none		
Runway Design (Table 3-3)	none		
Threshold Siting	none		
FAR PART 77			
Marking, easements, clearing	100 acres	$3,000,000	Easements, clearing and fixed object marking; Part 77 primary surface is already 1,000' width; extended 34:1 slope (beyond RPZ) has numerous penetrations.
		$3,000,000	

Source: Consultant analysis

Table E-35 - Suffolk Executive Airport (SFQ)
Runway 4 Visibility from 1 sm to ¾ sm

	Known Deficiencies	Additional Cost	Remarks
APPENDIX 16 (Table A16-1B)			
Height Above Touchdown (HAT)	none		
TERPS GQS	none		
TERPS W Surfaces	none		
TERPS Para 251	none		
Precision OFZ	none		
ALD	none		
Runway Length	none		
Runway Marking	none	$50,000	Upgrade to precision markings.
Hold Position Sign & Markings	none		
Runway Edge Lights	none		
Parallel Taxiway	Yes		To be completed with other airport development.
Approach Lights	Yes	$400,000	MALS.
OFZ	none		
Threshold Siting	none		
Airspace Analysis Survey	none		
		$450,000	

	Known Deficiencies	Additional Cost	Remarks
OTHER DESIGN STANDARDS			
Runway Separation (Table 2-2)	none		
RPZ (Table 2-4)	10 acres	$250,000	The ALD shows that 39 acres of the 49 acres are already owned in fee simple. An additional 10 acres are needed to own the entire RPZ in fee.
Runway Design (Table 3-3)	none		
Threshold Siting	none		
FAR PART 77			
Marking, easements, clearing	120 acres	$1,870,000	7 acres easements, 120 acres of clearing; Part 77 primary surface widens from 500' to 1,000'.
		$2,120,000	

Source: Consultant analysis

Table E-36 - Warrenton-Fauquier Airport (HWY)
Runway 14 Visibility from 1 sm to ½ sm

	Known Deficiencies	Additional Cost	Remarks
APPENDIX 16 (Table A16-1A)			
Height Above Touchdown (HAT)	none		
TERPS GQS	none		
TERPS W Surfaces	none		
TERPS Para 251	none		
Precision OFZ	none		
ALD	none		
Runway Length	none		
Runway Marking	none		
Hold Position Sign & Markings	none		
Runway Edge Lights	none		
Parallel Taxiway	none		
Approach Lights	Yes	$800,000	MALSR.
OFZ	none		
Threshold Siting	Yes	$300,000	Obstruction removal to the 34:1 slope.
Airspace Analysis Survey	none		
		$1,100,000	

	Known Deficiencies	Additional Cost	Remarks
OTHER DESIGN STANDARDS			
Runway Separation (Table 2-2)	none		
RPZ (Table 2-4)	none		
Runway Design (Table 3-3)	none		
Threshold Siting	none		
FAR PART 77			
Marking, easements, clearing	40 acres	$1,900,000	35 acres easements, 40 acres clearing; Part 77 primary surface widens from 500' to 1,000'.
		$1,900,000	

Source: Consultant analysis

Table E-37 - Warrenton-Fauquier Airport (HWY)
Runway 32 Visibility from 1 sm to ¾ sm

	Known Deficiencies	Additional Cost	Remarks
APPENDIX 16 (Table A16-1B)			
Height Above Touchdown (HAT)	none		
TERPS GQS	none		
TERPS W Surfaces	none		
TERPS Para 251	none		
Precision OFZ	none		
ALD	none		
Runway Length	none		
Runway Marking	none	$50,000	Upgrade to precision runway markings.
Hold Position Sign & Markings	none		
Runway Edge Lights	none		
Parallel Taxiway	none		
Approach Lights	Yes	$400,000	MALS.
OFZ	none		
Threshold Siting	none		
Airspace Analysis Survey	none		
		$450,000	

	Known Deficiencies	Additional Cost	Remarks
OTHER DESIGN STANDARDS			
Runway Separation (Table 2-2)	none		
RPZ (Table 2-4)	2 acres	$50,000	
Runway Design (Table 3-3)	none		
Threshold Siting	none		
FAR PART 77			
Marking, easements, clearing	5 acres	$150,000	Part 77 surface widens from 500’ to 1,000’.
		$200,000	

Source: Consultant analysis