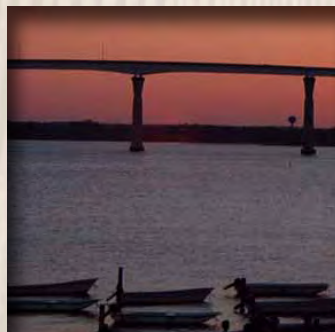




JOINT LAND USE STUDY REPORT

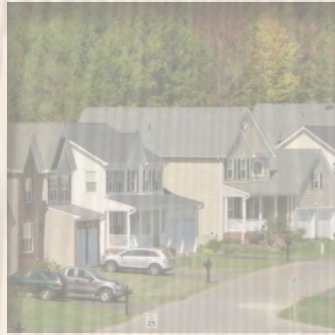
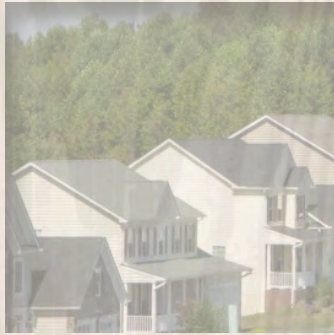
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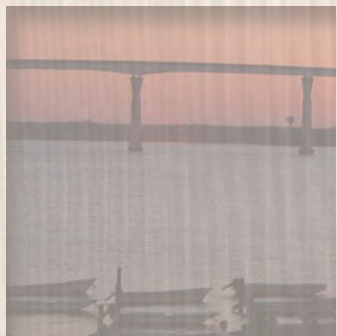


JOINT LAND USE STUDY REPORT

JANUARY 2015



This study was prepared under contract with the Tri-County Council for Southern Maryland, with financial support from the Office of Economic Adjustment, Department of Defense. The content reflects the views of the key JLUS partners involved in the development of this study and does not necessarily reflect the views of the Office of Economic Adjustment.



Joint Naval Air Station PAX Joint Land Use Study

Tri-County Council for Southern Maryland
P.O. Box 745
Hughesville, MD 20637

prepared by
Matrix 
DESIGN GROUP

January 2015

Please see the next page.



Policy Committee

The Policy Committee (PC) served an active and important role in providing policy direction during the development of the Naval Air Station Patuxent River (NAS PAX) Joint Land Use Study (JLUS). The Policy Committee comprised the following individuals:

- **Todd Morgan**, *Commissioner*
St. Mary's County
- **Candice Quinn-Kelly**, *Commissioner President*
Charles County
- **Ken Robinson**, *Commissioner*
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- **Kathleen Freeman**, *Director*
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- **Debbie Herr-Comwell**, *Program Administrator*
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Talbot County Office of Planning and Zoning
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- **Jeannette Studley and Patrick Small, AICP**
Planning Leads

Please see the next page.



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Please see the next page.



A

Acq	Acquisition
ADAMS	Advanced Dynamic Aircraft Measurement System
AGL	Above Ground Level
AICUZ	Air Installation Compatibility Use Zone
APZ	Accident Potential Zone
ATFP	Antiterrorism/ Force Protection
ATC	Air Traffic Control
ATR	Atlantic Test Range

B

BASH	Bird Air Strike Hazard
BIO	Biological Resources
BIP	Bay Impact Point
BIR	Bloodsworth Island Range

C

CDNL	Day Night Average Sound Level
CFR	Code of Federal Regulations
CIP	Capital Improvement Program
COM	Communication / Coordination
CZ	Clear Zone
CZMA	Coastal Zone Management Act

D

dB	Decibel
DC	District of Columbia
Disc	Real Estate Disclosures
DNL	Day-Night Level
DOD	Department of Defense

E

EAP	Encroachment Action Plan
ED	Energy Development
ESQD	Explosive Safety Quantity Distance Arcs

F

FAA	Federal Aviation Administration
FACSFAC VACAPES	Fleet Area Control & Surveillance Facility, Virginia Capes
FCC	Federal Communications Commission
FL	Flight Level
FS	Frequency Spectrum

H

Hab	Habitat Conservation Tools
HRAIZ	High Risk of Adverse Impact Zone

I

IFR	Instrument Flight Rule
IT	Information Technology

J

JLUS	Joint Land Use Study
------	----------------------

L

LAS	Land, Air, and Sea Space Competition
LEG	Legislative Initiatives / Tools
LG	Light and Glare
Ldnmr	Onset-Rate Adjusted DNL
LNG	Liquefied Natural Gas
LU	Land Use

M

MCA	Military Compatibility Area
MCAOD	Military Compatibility Area Overlay District
MD	Maryland
MDBED	Maryland Department of Business and Economic Development
MHz	Megahertz
MIA	Military Influence Area
MMIC	Maryland Military Installation Council
MOA	Military Operating Area / Memorandum of Agreement
MOU	Memorandum of Understanding
MSL	Mean Sea Level
MTR	Military Training Route

N

NAICS	North American Industry Classification System
NAVAIR	Naval Air Systems Command
NAS (PAX)	Naval Air Station (Patuxent River)
NAWCAD	Naval Air Warfare Center Aircraft Division
NGO	Nongovernmental Organization
NO	Noise (and Vibration)
NOAA	National Oceanic and Atmospheric Administration
NTWL	Naval Test Wing Atlantic

O

OEA	Office of Economic Adjustment
OLF	Outlying landing field
OPNAVIST	Office of Navy Instruction

P

PAX	Patuxent River
PC	Policy Committee
PEP	Personal Excellence Partnership
PFA	Priority Funding Area

R

R	Restricted Airspace
RAICUZ	Range Air Installation Compatible Use Zone
RC	Roadway Capacity
RDAT & E	Research, Development, Acquisition, Testing and Evaluation

S

SAF	Safety Zones
SEL	Sound Exposure Level
SUA	Special Use Airspace
STEM	Science, Technology, Engineering and Math

T

TAG	Technical Advisory Group
TCCSMD	Tri-County Council for Southern Maryland

U

UAS	Unmanned Aerial Systems
US	United States
USBC	Uniform State Building Code

V

VA	Virginia
VFR	Visual Flight Rule
VO	Vertical Obstruction

W

W	Warning Area
WQQ	Water Quality / Quantity

Y, Z

Zon	Zoning
-----	--------



1.1 JLUS Project Overview

Military installations are critical to local, regional, and state economies, generating thousands of jobs and millions of dollars in annual economic activity and tax revenue. In the past, incompatible development has been a factor in the loss of operational capabilities and restructuring of mission-critical components to other military installations. The loss of military missions and closure of military installations have been detrimental to their host communities. To protect the missions of military installations and health of local economies and industries that rely on them, encroachment must be addressed through collaboration and joint planning between installations and local communities. This Joint Land Use Study (JLUS) attempts to mitigate existing compatibility issues, facilitate the prevention of future issues, and improve coordination between the local communities and Naval Air Station Patuxent River Complex (NAS PAX).

NAS PAX is situated in St. Mary's County in Southern Maryland, at the mouth of the Patuxent River, a major tributary of Chesapeake Bay. Because the NAS PAX mission operating area is so expansive, several Maryland and Virginia communities and agencies participated as partners in this JLUS. Partner jurisdictions include: Calvert County, MD; Cambridge, MD; Caroline County, MD; Charles County, MD; Dorchester County, MD; Leonardtown, MD; Northumberland County, VA; St. Mary's County, MD; Talbot County, MD; Westmoreland County, VA; and Wicomico County, MD.

As a means to promote and coordinate the compatibility of future growth around the installation with military mission activities, an organized communication effort between NAS PAX, partner jurisdictions, and other stakeholder entities that own or manage land and / or resources in the region is needed.

The NAS PAX JLUS is a proactive approach for mitigating existing and preventing future military compatibility issues by facilitating collaboration between local communities, agencies, the public, and the Navy. This JLUS advocates increased communication for decisions relative to land use regulation, conservation, and natural resource management affecting both the community and the military. This study seeks to prevent conflicts experienced between the United States (US) military and local communities in other areas of the US and throughout the world by engaging the military and local decision-makers in a collaborative multi-agency planning process.

1.2 What Is a Joint Land Use Study?

A JLUS is a planning process accomplished through the collaborative efforts of stakeholders in a defined study area to identify compatible land uses and growth management guidelines within, and adjacent to, active military installation. These stakeholders include local community, state, and federal officials, residents, business owners, local tribal governments, nongovernmental organizations, and the military. The process is intended to establish and encourage a working relationship among military installations and proximate communities to prevent and / or reduce encroachment issues associated with future mission expansion and local growth. Although primarily funded by the Department of Defense (DOD), Office of Economic Adjustment (OEA), a JLUS is produced by and for local communities. The project management entity for the NAS PAX JLUS is the Tri-County Council for Southern Maryland (TCCSMD).

1.3 Why Prepare a Joint Land Use Study?

Although military installations and nearby communities are separated by a defined property boundary they often share natural and manmade resources such as land use, airspace, water, and infrastructure. Operational areas such as flight patterns and specialized airspace expand the military influence area footprint beyond defined property boundaries. Despite the many positive interactions among local jurisdictions, agencies, and the military, and because so many resources are shared, the activities or actions of one entity can create unintended impacts on another, resulting in conflicts. As communities develop and expand in response to growth and market demands, land use approvals have the ability to locate potentially incompatible development closer to military installations and operational areas. The result can generate new, or exacerbate existing, land use and other compatibility issues, often referred to as encroachment, which can negatively affect community safety, economic development, and sustainment of military activities and readiness. This threat to military readiness is currently one of the military's greatest concerns.

Collaboration and joint planning among military installations, local jurisdictions, and agencies protects the long-term viability of existing and future military missions. Working together also enhances local economies and industries before incompatibility becomes an issue. Recognizing the close relationship that should exist between installations and adjacent communities, the OEA implemented the JLUS program to mitigate existing and future conflicts and enhance communication and coordination among all affected stakeholders. This program aims to preserve the sustainability of local communities while protecting current and future research, development, acquisition, testing, and evaluation (RDAT&E) operations at NAS PAX.

1.4 JLUS Goal and Objectives

The goal of the NAS PAX JLUS is to protect the viability of current and future military mission and operating, while simultaneously guiding community growth, sustaining the environmental and economic health of the region, and protecting public health, safety, and welfare.

To achieve this goal, three primary JLUS objectives were identified.

- **Understanding.** Convene community and military representatives to identify, confirm, and understand compatibility issues and concerns in an open forum, considering both the community and military perspectives and needs. This includes increasing public awareness, education, and opportunities for input organized in a cohesive outreach program.
- **Collaboration.** Encourage cooperative land use and resource planning among NAS PAX and surrounding communities so that future community growth and development are compatible with the NAS PAX missions and operations, while seeking ways to reduce operational impacts on land within the study area.
- **Actions.** Provide a set of mutually supported tools, activities, and procedures from which local jurisdictions, agencies, and NAS PAX can select, prepare, and approve / adopt in order to implement recommendations developed during the JLUS process. The actions include both operational measures to mitigate installation impacts on surrounding communities and local government and agency approaches to reduce community impacts on military operations. These tools help decision makers resolve compatibility issues and prioritize projects within their annual budgeting processes.

1.5 Naval Air Station Patuxent River

Strategic and Economic Importance

NAS PAX is a unique asset within the DOD supporting naval aviation operations focusing on research, development, testing, and evaluation of aircraft, aircraft components, and related products. Three major Navy commands hosted by NAS PAX are the Naval Air Systems Command (NAVAIR) Headquarters, Naval Air Warfare Center Aircraft Division (NAWCAD), and Naval Test Wing Atlantic (NTWL). With facilities including flight simulators, electronic warfare systems, communications and navigation, warfare simulation, and threat air defense laboratories, NAS PAX is the busiest flight test center in the world. The facilities of NAWCAD are also used by foreign governments, academic institutions, and private industry for similar projects.

The most recent economic indicators illustrate the economic significance of the installation's presence in the region. Although exact employment and operational activity levels fluctuate from year to year, NAS PAX is the largest regional employer. According to the Maryland Department of Business and Economic Development (MDBED), NAS PAX either creates or supports 41,185 jobs, with an annual \$2.4 billion payroll disbursement. NAS PAX contributes over \$8 billion annually in Maryland, with a direct impact of \$2.59 billion, an indirect impact of \$2.44 billion, and an induced impact of \$1.54 billion. A substantial portion of this direct impact is derived from purchases, mostly made from in-state businesses totaling \$1.71 billion annually. As a national security asset, and in serving the RDAT&E functions of all aircraft, NAS PAX also provides economic benefits to the US as a whole.

Sources: NAVAIR NAWCAD PAX Brief, 2013; Mission MD, Maryland Department of Business and Economic Development, 2011.

Community Activities and Stewardship

In addition to the economic benefits NAS PAX provides to the region, NAS PAX is involved with a variety of community outreach and educational programs. The Patuxent Partnership is a non-profit member organization that works with government, industry, and academia to advance education through science, technology, engineering and math (STEM) based initiatives. The intent of this partnership is to foster cooperation and collaboration among academia, private industry, and government to bring together the key economic drivers in Southern Maryland.

Through this partnership, educational programs and opportunities are offered to K-12 school districts, colleges, and universities to address the declining enrollment rates in technology-related fields across the nation. The STEM program teaches technological knowledge and skills and provides opportunities for career exploration in numerous science and engineering pathways. A key feature of the STEM program is the involvement of local business and industry individuals from science, mathematics, and engineering career fields. Student mentoring and teacher training are offered to local schools. Students are given the opportunity to attend the Summer Space Camp sponsored by the Patuxent Partnership. Field experiences may include trips to the Patuxent River Naval Air Station.

NAS PAX's community stewardship has been awarded on multiple occasions, including its four 2013 Community Service Flagship Awards within NDW listed below:

- The Environmental Stewardship Flagship Award
- The Health, Safety and Fitness Flagship Award
- The Personal Excellence Partnership (PEP) Flagship Award
- The Project Good Neighbor Flagship Award

These are just several examples of the many community benefits and stewardship activities to which NAS PAX contributes.

1.6 JLUS Study Area

NAS PAX is situated in Southern Maryland on a peninsula at the mouth of the Patuxent River, a major tributary of Chesapeake Bay. The Main Station and Webster Field occupy approximately 6,500 acres and 85 acres respectively within St. Mary's County. The overall operating area and airspace extend well beyond St. Mary's County to include additional jurisdictions in Maryland, Virginia, and Delaware. Additional special areas are located throughout the region; however, these areas are not within the scope of this JLUS.

NAS PAX is approximately 70 miles south of the Maryland state capital of Annapolis and strategically located between major cities approximately 90 miles south of Baltimore, MD; 115 miles northeast of Richmond, VA; 75 miles south of Washington, DC, and 190 miles southwest of Philadelphia, PA.

The NAS PAX study area was defined to address the communities that may impact current or future NAS PAX military operations or be impacted by military operations. Due to its location and affiliated operations within three states (Delaware, Maryland, and Virginia), the general JLUS Study Area (shown in Figure 1) was identified as NAS PAX Main Station, Webster Field, and the overall area utilized by NAS PAX throughout the region. The preliminary study area was determined by the jurisdictions located within this operational area that are participating in this JLUS as partners and refined based on input from the JLUS committees and subject matter experts. Due to the regional expanse of the study area, smaller manageable sub-areas have been defined that are likely to be affected by the same or similar issues. These sub-areas are:

- **Middle Eastern Shore Sub-Area:** The counties in this sub-area are Caroline, Dorchester, and Talbot.
- **Lower Eastern Shore Sub-Area:** The counties included in this sub-area are Somerset and Wicomico.

- **Southern Maryland Sub-Area:** Counties included in this sub-area are Calvert, Charles, and St. Mary's. This is also where NAS PAX Main Station and Webster Field are located.
- **Virginia Northern Neck Sub-Area:** Two of the participating counties are located in Virginia's Northern Neck— Northumberland and Westmoreland counties.

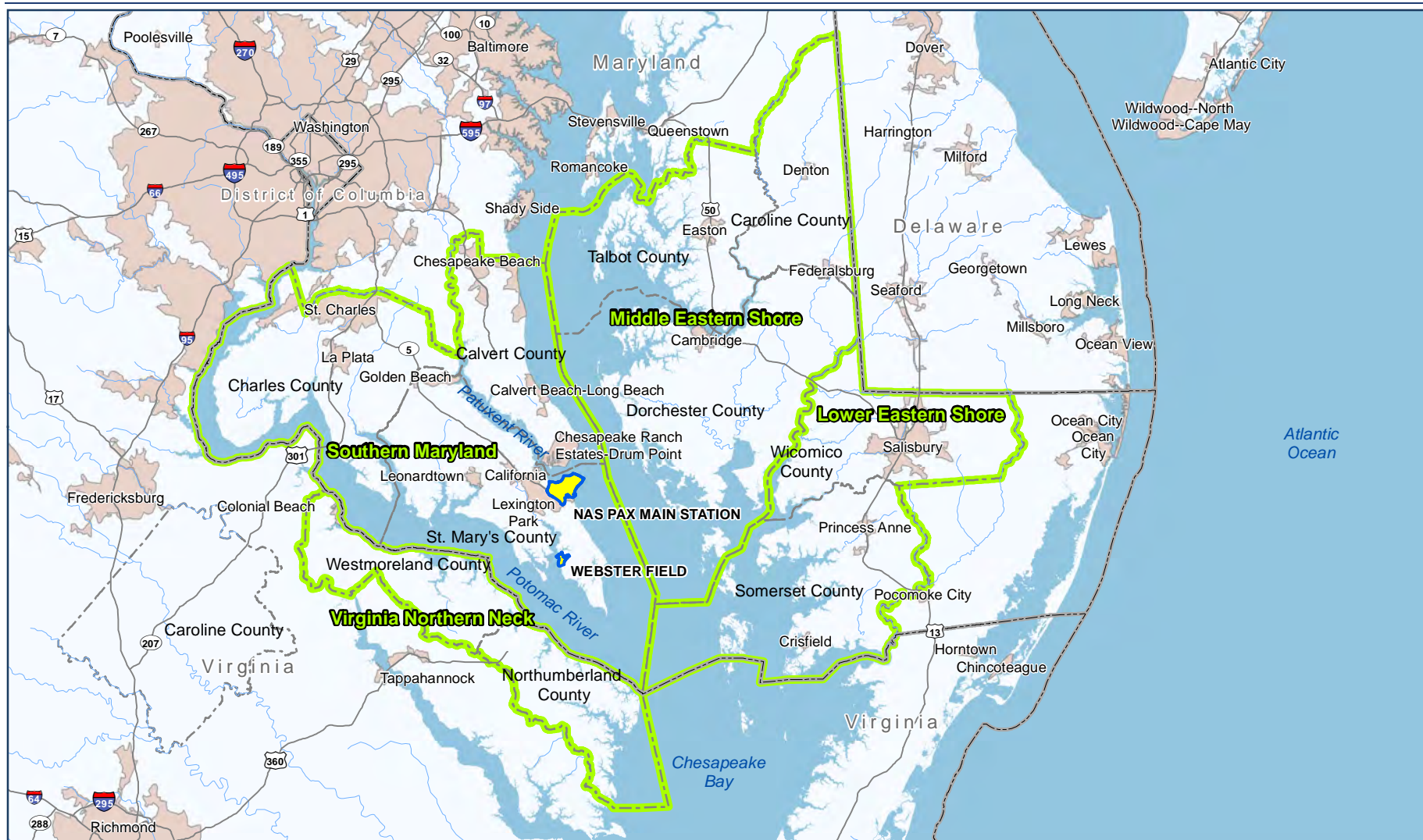
1.7 JLUS Partners and Public Outreach

The JLUS process was designed to create a locally relevant document that builds consensus and garners stakeholder support. To achieve the JLUS goals and objectives, the NAS PAX JLUS process included a public outreach program providing a variety of participation opportunities for interested parties.

Stakeholders

An early step in any planning process is stakeholder identification. Informing and involving them early is instrumental to identifying, understanding, and resolving their most important issues through the development of integrated strategies and measures. Stakeholders include individuals, groups, organizations, and governmental entities interested in, affected by, or affecting the outcome of the JLUS document. Stakeholders identified for the NAS PAX JLUS include:

- Local jurisdictions (counties, cities, and towns)
- DOD officials (including OEA representatives) and military installation personnel
- Local, county, regional, and state planning, regulatory, and land management agencies
- Landholding and regulatory federal agencies
- The public (including residents, businesses, and landowners)
- Environmental advocacy organizations
- Nongovernmental organizations (NGOs including Chambers of Commerce)
- Other special interest groups (including local educational institutions and military interest groups)



Legend

- Installation
- JLUS Sub-Area
- State/District Boundary
- County Boundary
- Highway
- River
- City/Community
- Water Body



0 6 12
Miles

Matrix
DESIGN GROUP
Sources: ESRI, 2010; NAS Pax, 2010

Figure 1
Joint Land Use Study Area

NAS_PAX_Fig1_StudyArea_20141211_CJM.pdf

Policy Committee and Technical Advisory Groups

The development of the NAS PAX JLUS was guided by two committees, comprising community leaders, NAS PAX personnel, federal and state agencies, resource agencies, local governments, and other stakeholders.

JLUS Policy Committee (PC). The PC consists of officials from participating jurisdictions, military installation leadership, and representatives from other interested and affected agencies. The PC is responsible for the overall direction of the JLUS, preparation, and approval of the study design, policy recommendations, and draft and final JLUS documents.

JLUS Technical Advisory Groups (TAGs). The purpose of the Technical Advisory Groups (TAGs) is to provide technical expertise, feedback, and suggestions to the JLUS team and to serve as communications liaisons to their respective organizations. Two TAGs assisted in the technical aspects of the NAS PAX JLUS: the East Area TAG and the West Area TAG. The East Area TAG focused on the portions of the study area located to the east of the Chesapeake Bay, including Talbot, Caroline, Dorchester, Wicomico, and Somerset counties. The West Area TAG focused on the portions of the study area located to the west of the Chesapeake Bay, St. Mary's, Charles, Calvert, Northumberland, and Westmoreland counties.

The TAGs identified and addressed technical issues, provided feedback on report development, and assisted in the development and evaluation of implementation strategies and tools. These stakeholders engaged with the PC, in an advisory role, and attended PC meetings to provide input. The responsibilities and list of participants for the JLUS sponsors, the PC, and the TAGs are identified in Tables 1, 2, and 3, respectively.

The PC and TAG members serve as liaisons to their respective stakeholder groups and responsible for conveying committee activities and information to their organizations and constituencies. Members of the PC and TAG's relayed their organization's comments and suggestions to their respective committees for consideration. The PC members were encouraged to conduct meetings with their organizations and / or constituencies to facilitate this input.

Table 1. JLUS Sponsor Responsibilities and Participants

Responsibilities	Participants
<ul style="list-style-type: none"> ■ Coordination ■ Financial Contribution ■ Accountability ■ Grant Management 	<ul style="list-style-type: none"> ■ Tri-County Council for Southern Maryland ■ Office of Economic Adjustment

Table 2. JLUS Policy Committee Responsibilities and Participants

Responsibilities	Participants
<ul style="list-style-type: none"> ■ Policy Direction ■ Study Oversight ■ Monitoring ■ Report Acceptance 	<ul style="list-style-type: none"> ■ Calvert County, MD ■ Caroline County, MD ■ Charles County, MD ■ Dorchester County, MD ■ City of Cambridge, MD ■ Northumberland County, VA ■ St. Mary's County, MD ■ Town of Leonardtown, MD ■ Talbot County, MD ■ Westmoreland County, VA ■ Wicomico County, MD ■ NAS PAX

Table 3. JLUS Technical Advisory Group Responsibilities and Participants

Responsibilities	Participants
<ul style="list-style-type: none"> Identify Issues 	<ul style="list-style-type: none"> Calvert County
<ul style="list-style-type: none"> Provide Expertise to Address Technical Issues 	<ul style="list-style-type: none"> Caroline County Charles County
<ul style="list-style-type: none"> Evaluate and Recommend Implementation Options to the PG 	<ul style="list-style-type: none"> Dorchester County Talbot County
<ul style="list-style-type: none"> Provide Draft and Final Report Recommendations to the PC 	<ul style="list-style-type: none"> Northumberland County St. Mary's County Westmoreland County Wicomico County Easton Airport Federal Aviation Administration The Nature Conservancy St. Mary's County Chamber of Commerce Southern Maryland Navy Alliance Charles County Chamber of Commerce NAS PAX

Public Participation

The general public was instrumental in the development of this JLUS and strategies by providing input and feedback, both in public workshops and through the use of the interactive project website (www.paxjlus.com).

Public Workshops

In addition to the PC and TAG meetings, a series of public workshops were held throughout the development of the JLUS. These workshops provided an opportunity for the exchange of information with the greater community, assisted in identifying issues to be addressed, and provided input on proposed strategies. Each workshop included a traditional presentation and a facilitated exercise providing a “hands on,” interactive opportunity for the public to participate in the plan development.



JLUS Public Workshop in Southern Maryland, September 2013

Public Outreach Materials

There were several publications that were developed during the course of the JLUS to keep the public informed and knowledgeable about how a JLUS is conducted and what to expect as the end product. These materials were handed out during the public workshops and were also posted to the project website for easy access throughout the length of the project.

JLUS Fact Sheet / Compatibility Factors Brochure. At the beginning of the JLUS process, a Fact Sheet was developed describing the JLUS program, objectives, methods for public input, and proposed the NAS PAX JLUS study area. This Fact Sheet was made available at the meetings for review by interested members of the public.



NAS PAX JLUS Fact Sheet

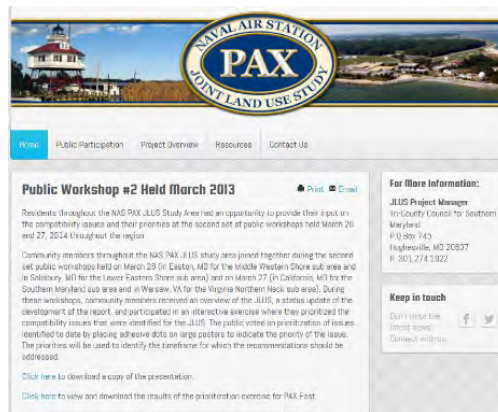
This Fact Sheet served as an informational brochure describing each compatibility factor considered for JLUS development. While not every factor may apply to the NAS PAX JLUS, this list provided an effective tool to conduct a comprehensive evaluation of compatibility factors within the study area.

Strategy Tools Brochure. JLUS strategies incorporate a variety of actions that local governments, military installations, agencies, and other stakeholders can take to promote compatible land use planning. This brochure provided an overview of strategy types that can be applied to address study area compatibility issues including but not limited to acquisition and easements, code enforcement, Military Compatibility Areas (MCA), legislative tools, and communication and coordination.



NAS PAX Strategy Tools Brochure

Website. A project website was developed to provide stakeholders, the public, and media representatives with access to project information. The website was maintained for the entire duration of the project to make information easily accessible. Information contained on the website included program points of contact, schedules, relevant



NAS PAX Project Website

documents and maps, public meeting information, and downloadable comment forms. The project website is located at www.paxjlus.com.

1.8 JLUS Implementation

It is important to note that once the JLUS process is completed, the final document is not an adopted plan but a set of strategies to be reviewed and potentially implemented by local jurisdictions, agencies, and organizations in the NAS PAX JLUS study area to guide future compatibility efforts. Acceptance of the study by stakeholders, i.e., committees, the public, landowners, local agencies, and industries, will confirm collective community-based support for identified implementation efforts. For instance, local jurisdictions, counties, and regional governments may use the strategies to guide future subdivision regulation, growth policy, and zoning updates and to assist in the review of development proposals. NAS PAX can use the JLUS to guide its interaction with local jurisdictions on future projects and manage internal planning processes with a compatibility-based approach.

The key to implementation was the establishment of the JLUS Implementation Task Force that will oversee the execution of the JLUS. Through this Committee, local jurisdictions, NAS PAX, and other interested parties will be able to continue their initial work together to establish procedures, recommend or refine specific actions for member agencies, and make adjustments to strategies over time to ensure the JLUS continues to resolve key compatibility issues.



2.1 Introduction

The Naval Air Station Patuxent River Complex (NAS PAX) Joint Land Use Study (JLUS) study area encompasses the areas surrounding the military installation influenced by military operations. The overall study area extends across Maryland and beyond to portions of Virginia and Delaware including the NAS PAX Main Station; NAS PAX Webster Outlying Landing Field (Webster Field); and the airspace utilized for military operations as well as communities affected by NAS PAX activities. The landscape within the study area consists of coastal lowlands surrounding the Chesapeake Bay used for agriculture from the time of Maryland's original settlement. The general area has largely maintained its rural character with small towns threaded along state routes running through the woodlands and farms along the bay. The long peninsulas and width of Chesapeake Bay have resulted in limited transportation options through the region. The topography has also allowed the eastern and western shores to remain fairly isolated with the nearest crossing (Highway 301) located approximately 45 miles north of NAS PAX.

2.2 JLUS Community Growth Trends

The following provides a profile of the study area's growth trends concerning population change establishing the regional context for growth potential in the region. The population data is based on information obtained from the US Census Bureau and shows the growth or decline within the study area. Table 4 provides a comparison of the changes in population in the region between 2000 and 2010, noting the percentage change over the decade.

Population levels have remained fairly stable throughout the study area over the past ten years; however, each jurisdiction within the study area in the state of Maryland, with the exception of Dorchester County, Somerset County, and the City of Crisfield, experienced growth at a rate higher than the state.

St. Mary's County and the Town of Leonardtown experienced the highest population growth rate in the study area. The two counties in Virginia remained relatively stable with minimal population growth.

Middle Eastern Shore Sub-Area

Caroline County

Caroline County was formed in 1773 from portions of Dorchester and Queen Anne's counties. Caroline County is located in the central portion of Maryland's eastern border approximately 60 miles northeast of NAS PAX. Caroline County covers 321 square miles or 206,719 acres. The county is located on the Delmarva Peninsula and is part of the Upper Eastern Shore Region, which is comprised of Caroline, Cecil, Kent, Queen Anne's, and Talbot counties. The county is bordered by Queen Anne's, Talbot, and Dorchester Counties in Maryland and Kent and Sussex Counties in the State of Delaware. The Choptank River and Tuckahoe Creek separate Caroline County from Talbot County to the southwest and Tuckahoe Creek separates Caroline County from Queen Anne's County to the northwest.

Caroline County's population increased slightly between 2000 and 2010 and expects to see similar growth over the next 20 years. Much of this growth is anticipated in unincorporated land throughout the county. The population increase coincides with a consistent increase in average yearly wages over the decade. As of the 2010 census, Caroline County was the fifth least populous county in Maryland. Its largest town is Denton.

Sources: Caroline County 2006 Land Preservation, Parks, and Recreation Plan; Maryland Department of Labor, Licensing, and Regulation Labor Market Report, 2013; Town of Denton History, 2013; US Census 2010

Table 4. Population Change 2000-2010; Growth through 2030

Jurisdiction	2000	2010	Percent Increase	2020	2030
State of Maryland	5,296,486	5,773,552	9%	6,216,150	6,611,900
Calvert County	74,563	88,737	19%	95,600	100,200
Caroline County	29,772	33,066	11%	36,650	41,150
Charles County	120,546	146,551	22%	174,350	202,150
Dorchester County	30,674	32,618	6%	35,000	37,950
City of Cambridge	10,911	12,326	13%	Not Available	Not Available
Somerset County	24,747	26,470	7%	27,900	29,050
City of Crisfield	2,723	2,726	0%	Not Available	Not Available
St Mary's County	86,211	105,151	22%	125,150	148,750
Town of Leonardtown	1,896	2,930	55%	Not Available	Not Available
Talbot County	33,812	37,782	12%	40,850	42,900
Wicomico County	84,644	98,733	17%	109,200	119,200
State of Virginia	7,078,515	8,001,024	13%	89,17,395	9,825,019
Northumberland County	12,259	12,330	1%	15,996	17,699
Westmoreland County	16,718	17,454	4%	18,501	19,399

Source: US Census Bureau, 2000-2010; Maryland State Data Center, 2012; Virginia Employment Commission, 2013

Dorchester County

Dorchester County is the largest county in Maryland, covering nearly 629,120 acres with over 1,700 miles of shoreline and nearly surrounded by the Chesapeake Bay and its tributaries. The county is located south of Caroline and Talbot counties and is bordered by the state of Delaware to the east and Wicomico and Somerset counties to the south. The county's western shore is approximately five miles east of NAS PAX. The county includes numerous islands on the Bay and the Blackwater National Wildlife Refuge and the Taylors Island Wildlife Management Area. The county was colonized as part of the land claims made by Lord Baltimore in 1669. Dorchester County operates under a home rule form of government with a County Council consisting of five members, one from each of the districts throughout the county.

Dorchester County experienced a slight decline in population leading up to the year 2000 and has since experienced a slight growth in population, which is expected to increase over the next 20 years. Most of this growth is anticipated in the North Dorchester and Cambridge areas. Cambridge's 2010 population increase mirrors an increase in jobs in Cambridge and Dorchester County. Cambridge is the fourth most populous city in Maryland's Eastern Shore, after Salisbury, Elkton and Easton.

Sources: Dorchester County Comprehensive Plan, 1994; Dorchester County homepage; Maryland Department of Labor, Licensing, and Regulation Labor Market Report, 2013; US Census 2010

City of Cambridge

The City of Cambridge serves as the county seat of Dorchester County and is the county's largest incorporated municipality. It is located along US Highway 50 in the northern portion of the county. Cambridge was founded in 1684 as a tobacco farming plantation and has maintained important agricultural and maritime industries, including fishing and oyster harvesting.

The city has taken measures to preserve its historical character with tourism supporting growth in retail and services, replacing manufacturing which has been steadily declining since the 1980s.

Source: City of Cambridge Comprehensive Plan, 2011; City of Cambridge Homepage, accessed October 2013; Maryland Department of Labor, Licensing, and Regulation Labor Market Report, 2013; US Census Bureau 2010

Talbot County

Talbot County is located on the eastern shore of Chesapeake Bay midway down the Delmarva Peninsula. The City of Easton is the county seat located approximately 35 miles northeast of NAS PAX. The county is bordered to the north by Queen Anne's County, the east by Caroline County, the south by Dorchester County, and the west by the Chesapeake Bay. The county mostly comprises rural residential, agricultural, and open space land uses, with development centered around Easton and other smaller jurisdictions such as Trappe to the south, and St. Michaels to the west.

Talbot County's population increased marginally during the first decade of the 21st century. The total increase in population was approximately twice the number of the increase in occupied housing units over that duration. As of the 2010 census, Talbot County was the sixth least populous county in Maryland. Nearly half of the county lives in its most populous city, Easton.

Sources: Maryland Department of Business and Economic Development, Brief Economic Facts Talbot County, Maryland, 2013; Maryland Department of Labor, Licensing, and Regulation Labor Market Report, 2013; Talbot County Comprehensive Plan, 2005; Talbot County Homepage, US Census 2010

Lower Eastern Shore Sub-Area

Somerset County

Somerset County is located at the southern edge of Maryland, bordering Dorchester and Wicomico counties to the north, Worcester County to the east, the State of Virginia to the south, and St. Mary's County across the Chesapeake Bay to the west. The county was established in 1666 by Quakers who migrated from Virginia. The topography is generally flat, with favorable

agricultural soils punctuated by areas of poorly drained wetlands and a high water table. Numerous Wildlife Management Areas and state parks are located throughout Somerset County. Much of the county is subject to Critical Area and other environmental regulations due to its considerable tidal and non-tidal wetland resources.

Somerset County's population decline has been occurring over the past several decades as a result of limited employment opportunities outside of the City of Crisfield. Crisfield's 2010 population was 2,726 and continues to decline. This decline has been evident since the turn of the 20th Century and the collapse of fisheries in conjunction with the decline of the Chesapeake Bay ecosystem.

Sources: Somerset County Land Preservation, Parks, and Recreation Plan, 2012; Maryland Department of Labor, Licensing, and Regulation Labor Market Report, 2013; US Census Bureau 2010

City of Crisfield

The City of Crisfield is located at the southernmost tip of Somerset County at the terminus of State Route 413. The city is approximately 35 miles southeast of NAS PAX and is bordered to the north by the Jane's Island State Park. Crisfield was founded in 1666 as a coastal fishing village and popular docking station for colonials. The city was formally incorporated in 1872. Somerset County has established an Enterprise Zone in Crisfield which provides tax credits for capital improvements to create local jobs. Chesapeake Bay Critical Area regulations cover a large area of the city.

Sources: City of Crisfield Comprehensive Plan, 2010; City of Crisfield Homepage; Maryland Department of Business and Economic Development, Brief Economic Facts Somerset County, Maryland, 2013; Maryland Department of Labor, Licensing, and Regulation Labor Market Report, 2013; US Census 2010

Wicomico County

Wicomico County, Maryland, is located at the southern end of the Delmarva Peninsula. The county is bordered to the north by the State of Delaware and Dorchester County, Maryland; the east by Worcester County, Maryland; the south by Worcester and Somerset Counties in Maryland; and

the west by Dorchester County, the Nanitoke River, and the Chesapeake Bay. Created from neighboring Somerset and Worcester counties in 1867, Wicomico County has a long history deeply rooted in the Eastern Shore culture of today. The Wicomico County Seat of Salisbury dates back to 1732. The area is rich in colonial and post-revolutionary American history.

In 2010, the population of Wicomico County was 98,733. Wicomico County contains the largest population on Maryland's Eastern Shore and is one of the most rapidly growing counties on the Delmarva Peninsula. The county continues to plan for a moderate population growth, encouraging the retention of existing residents and workforce in-migration.

Sources: Maryland Department of Business and Economic Development, Brief Economic Facts Wicomico County, Maryland, 2013; Maryland Department of Labor, Licensing, and Regulation Labor Market Report, 2013; US Census 2010; Wicomico County Homepage; Wicomico County Zoning Map, 2009

Southern Maryland Sub-Area

Calvert County

Calvert County was founded in 1658 and is located at the northern end of the JLUS study area on the western shore of the Chesapeake Bay. Calvert County is Maryland's smallest county with only 140,000 acres. The county is a peninsula surrounded by the Chesapeake Bay on its eastern side and the Patuxent River on the west. Much of the bay side of the county is characterized by steep wooded cliffs while the Patuxent River side contains a mixture of rolling hills and flat lands, primarily in agricultural use.

Calvert County experienced a steady increase in population from 2000 to 2010. The nearly 20 percent raise can be attributed in part to the increase in suburban development within the county. The rise in housing development has brought with it an expansion of the workforce.

The county contains only two classified municipalities: Chesapeake Beach and North Beach. The majority of the population within Calvert County resides in unincorporated areas and town centers.

Sources: Calvert County Zoning Map, 2013; Calvert County Zoning Ordinance, 2012; Maryland Department of Business and Economic Development, Brief Economic Facts Calvert County, Maryland, 2013; Maryland Department of Labor, Licensing, and Regulation Labor Market Report, 2013; US Census 2010

Charles County

Charles County is located approximately 25 miles northwest of NAS PAX and is bordered by Prince George's County, St. Mary's County, Calvert County, and the Potomac River, to the north, south, east, and west, respectively. The county's rolling countryside is dotted with historic landmarks. The original Charles County was created in 1650 and included portions of St. Mary's, Calvert, and Prince George's counties. Its present boundaries were established in 1658 by an Order in Council as part of the Maryland colony. The area historically served as a center for agriculture, but has recently experienced development pressure and more than doubled in population since 1970 due to the expanding Washington, DC metropolitan area.

Charles County's close proximity to the Washington-Baltimore area, open spaces, rural areas, waterfront, and villages continue to attract residents. Between 2000 and 2010 Charles County's population increased by 22 percent, making both Charles and St. Mary's counties the fastest growing counties in Maryland. The county's population is expected to continue to grow as employment opportunities expand in the region as a result of proximity to the Washington metropolitan region and several military installations.

Sources: Charles County Comprehensive Plan, 2012; Charles County Zoning Ordinance, 2010; Maryland State Archives Homepage; Maryland Department of Business and Economic Development, Brief Economic Facts Charles County, Maryland, 2013; Maryland Department of Labor, Licensing, and Regulation Labor Market Report, 2013; US Census 2010

St. Mary's County

St. Mary's County, in Southern Maryland, is on the peninsula formed by the confluence of the Potomac and Patuxent Rivers and the Chesapeake Bay, 55 miles southeast of Washington, DC, and 80 miles south of Baltimore. First settled in 1634, St. Mary's County is bordered by the Patuxent River to the north, the Chesapeake Bay to the east, the Potomac River to the south, and Charles County to the west. NAS PAX is located at the northeast corner of the county. Settlers in search of economic opportunity and religious freedom founded the county in 1634, and in 1649 the first law establishing the freedom to practice religion in the colonies was passed. This law later became the basis for Article One of the US Constitution. From the county's inception through WWII, farming and fishing uses dominated; however, the establishment of NAS PAX in 1942 changed the course of development in the county.

Population growth has been steady throughout St. Mary's County for several decades. The county's population increase of 22 percent between the years 2000 and 2010 is largely attributable to exurban migration from the Washington and Baltimore Metropolitan regions, primarily as a result of job creation at NAS PAX. Growth is expected to continue as additional technology and engineering jobs are added to support NAS PAX and other Navy installations throughout the region.

Sources: St. Mary's County Comprehensive Plan, 2010; St. Mary's County Comprehensive Zoning Ordinance, 2013; Maryland Department of Business and Economic Development, Brief Economic Facts St. Mary's County, Maryland, 2013; Maryland Department of Labor, Licensing, and Regulation Labor Market Report, 2013; US Census 2010

Town of Leonardtown

Leonardtown is located in central St. Mary's County, Maryland. Established in 1708, Leonardtown is the only incorporated municipality in St. Mary's County and serves as the county seat. The area has experienced fluctuations in population levels with economic changes and has taken several steps to redevelop its downtown and waterfront as a means of attracting a growing tourism industry and capitalizing on popular outdoor recreation activities.

Leonardtown is located approximately 10 miles due west of NAS PAX and has benefitted from the influx of military-related jobs which have moved to the area in recent years, including DynCorp International, Northrop Grumman, and Engility, whom are all major employers in the area.

Sources: Town of Leonardtown Comprehensive Plan, 2010; Town of Leonardtown Homepage; Maryland Department of Business and Economic Development, Brief Economic Facts St. Mary's County, Maryland, 2013; Maryland Department of Labor, Licensing, and Regulation Labor Market Report, 2013; US Census 2010

Virginia Northern Neck Sub-Area

Northumberland County

Northumberland County was established in 1648 as part of the English colonies in the Americas, situated on the Northern Neck peninsula in northern Virginia where the Potomac River flows into the Chesapeake Bay. The county is bounded by the Potomac River to the north, the Chesapeake Bay to the east, Lancaster County to the south, and Richmond and Westmoreland counties to the west. Northumberland County, Virginia, called the "Mother Country of the Northern Neck," was originally known as Chickacoan, a Native American district on the Northern Neck lying between the Rappahannock and Potomac Rivers. For hundreds of years Northumberland remained a county largely isolated from the rest of the state due to the lack of a road network. In 1926 the bridge crossing from Essex County to the Northern Neck provided access to the west, which initiated growth in the area.

Although still very much rural, Northumberland County's qualities have attracted people to the area, resulting in building along the county shoreline. The period of declining population has begun to reverse with a one percent population increase between 2000 and 2010.

Sources: Northumberland County Homepage, accessed October 2013; Virginia Employment Commission, 2013; US Census 2010

Westmoreland County

Located approximately 25 miles southwest of NAS PAX, Westmoreland County is bordered by the Potomac River to the north, Northumberland County to the east, Richmond County and the Rappahannock River to the south, and King George County to the west. The county was originally created from a division of Northumberland County in 1653. The county is approximately 229-square-miles. The county originally consisted of widespread farming, which still characterizes much of the landscape today. In recent years, the county has attracted new growth from expansion from the Washington, D.C. area which continues to bring new residents to the county.

Westmoreland County's gradual population increase over the past decade has occurred from attracting residents from other counties in the Washington Metropolitan area. The increase in population over the next 20 years is expected to favor individuals above retirement age as the county continues attract retirees and those seeking second homes.

Sources: US Census 2010; Virginia Employment Commission, 2013; Westmoreland County Comprehensive Plan, 2010

Future Population Projections

The Maryland State Data Center and the Virginia Employment Commission prepare thirty year population growth estimates for their respective states and all counties within their jurisdictions. These projections, expressed in Table 1, indicate a continued rate of growth for the counties in the study area. As local population growth continues, these counties will have to balance growth with preservation. In most study area counties, growth policies outlined by comprehensive plans delineate district or municipal boundaries which are enforced through zoning ordinances at the county or city level. Zoning ordinances establish infrastructure expansion limitations by establishing allowable land uses for different zones. Many jurisdictions have incorporated open space, rural, agricultural, watershed, or park zones outside of developed areas to focus growth and redevelopment into the development districts. These planning controls are discussed in greater detail in Chapter 4.

2.3 JLUS Community Economic Trends

The Chesapeake Bay area is host to a diverse economy incorporating traditional regional drivers with shifting economic trends. According to the North American Industry Classification System (NAICS), which classifies economic activity into major industries and provides employment estimates, the major industries by employment in the study area include manufacturing, retail trade, healthcare and social assistance, and accommodation and food services. Manufacturing has been an important source of employment in the area over the past century and adapted to meet new regulatory requirements and new industries. The emerging tourism industry supports a diverse array of employment in accommodation, food services, and retail trade as the agricultural lowlands and wildlife refuges have drawn many visitors to the Chesapeake Bay area. This reflects the reinvestment local jurisdictions are making to protect their open spaces and revitalize downtown areas while continuing manufacturing productivity with military and other industry-supported research and production. These trends are evident by the establishment of major employers throughout the study area, including military contractors such as Boeing, Lockheed Martin, and Northrup Grumman and traditional seafood and agricultural producers such as Amick Farms, Sysco Eastern Maryland, and Southern Connection Seafood. Medical services and healthcare have been rapidly increasing with numerous hospitals and medical services centers established throughout the study area.

Calvert County

Though Calvert County consisted mostly of agricultural farms and manufacturing, it is quickly becoming one of the wealthiest counties in the nation. According to NAICS establishment data, the largest industries within the county are construction, trade, transportation and utilities, and professional and business services. The emphasis on supporting infrastructure through employment numbers represents the amount of growth currently occurring throughout Calvert County. Among its largest employers are Calvert Memorial Hospital, Constellation Energy / Calvert Cliffs Nuclear Power Plant, Walmart, and Giant Food.

While most of the residents in Calvert County commute outside of the county for work, the median household income is among the highest in the country. Data from the US Census Bureau showed that Calvert County residents make approximately 12 percent more than the average Maryland resident and 44 percent more than the average American. Based on the 2000 and 2010 US Census, Calvert County was recorded as the 32nd and 16th richest county in the nation, respectively.

Caroline County

Caroline County's economy is evolving from a rural and agricultural economy to a diversified economy supported by services, distribution, and industrial uses. Manufacturing is the largest industry sector, with several major employers including Solo Cup Operating Corporation, Maryland Plastics, and the Tri Gas & Oil Company. Healthcare has been a rapidly growing industry with employment nearly doubling from 1999 to 2011. Major healthcare employers include the Caroline Nursing Home and Choptank Community Health System. Interstate-95, Caroline County's major north-south traffic artery, provides easy access to growing areas of the county.

Major economic development initiatives in Caroline County include the improvement of regional infrastructure and services to create economies of scale, expanding tourism opportunities, and creating new industry opportunities with a focus on providing opportunities for young people. The county has identified various economic development and growth goals that promote industry while balancing the protection of the county's environmental and cultural heritage. The County has set aside land in appropriate locations for new commercial, industrial, and institutional uses to encourage economic development while minimizing the impacts on neighboring property owners; supporting historical tourism efforts; and developing detailed surface mining performance and site mitigation standards. Municipal growth objectives are focused on attracting new employers, encouraging growth of local shops in downtown areas, and creating a greater demand for the service industry.

Charles County

With its location in the center of two major metropolitan regions, Baltimore and Washington D.C., Charles County's economy is influenced by its proximity to military installations in the region. Charles County is home to Naval Support Facility Indian Head, the county's largest employer including 3,100 personnel with more than 1,300 scientists, engineers, and technicians. Employment parks are located throughout the county along key transportation corridors and designed to accommodate defense related companies with anti-terrorism/force protection compliance measures. Headquartered in La Plata, the College of Southern Maryland supports employers' workforce training needs. Willis Group, also located in La Plata, consists of multiple subsidiaries related to the petroleum industry. One of these subsidiaries, Southern Maryland Oil Motor Fuels, is the largest independent marketer of Shell Oil in the country. Regional firms headquartered in the county are complemented by a growing number of tech-related employers: Naval Support Facility Indian Head, Facchina Global Services, SAIC, Energetics Technology Center, OutsourcelT, and Zekiah Technologies. Four main business and industrial parks have been programmed to accommodate the county's growing technology and research and development based economy.

In addition to its government and military focused assets, the county recognizes the economic importance of water-related tourism and continues to seek additional water access sites and facilities along the Potomac River and its tributaries.

Dorchester County

Over the past several decades, Dorchester County has experienced a pronounced shift from a manufacturing economy to a retail and service based economy. Traditional and innovative manufacturing and services including IT, tourism, and agriculture/ aquaculture are the current primary employment sectors. Among the largest employers in the county are Amick Farms, Hyatt Regency Chesapeake Resort, and the Shore Health System. Future economic development in the count is anticipated to take advantage of the area's natural resources, including maritime industries, tourism, agriculture, and forestry. Given Dorchester's maritime identity, the county is a prime

tourist destination for boaters and paddlers who enjoy exploring its many waterways and marshes. The county continues to diversify its industry mix through the provision of improved infrastructure such as the new 113-acre Dorchester Regional Technology Park serving the county and region. Located across from the Cambridge-Dorchester Regional Airport, the park is in one of the county's two State Enterprise Zones. Hurlock Industrial Park located in the north of the county and Chesapeake Industrial Park in Cambridge are also within Enterprise Zones.

Talbot County

From its beginning as an English colony, agriculture and seafood products have been Talbot County's chief industries. The original economy was based on tobacco farming, then replaced by tomatoes, fruit, and dairy products, corn, soybeans, and poultry. Equally important have been the maritime industry, including shipbuilding, seafood harvesting and processing, and today, water-related tourism such as sailing and sport fishing. Several vibrant small towns have supported both the farming and maritime industries as centers for trade, craftsmen, and manufacturing. Today the county's primary industry is still agriculture, although health care is an emerging industry. The University of Maryland Shore Regional Health is the largest employer in the Mid-Shore Region with 2,000 employees, 1,700 of which reside in Talbot County. Retirees and tourists have also created a new economy in the area.

Current initiatives focus on promoting environmental studies to attract environmental technology companies, expanding its diverse manufacturing base, and attracting developing science and technology businesses. The county is host to seven industrial parks with space available for emerging companies. Emerging cyber, biometric and defense contractors are attracted to Talbot County for the availability of secure sites, high speed redundant fiber and access to over 90 critical federal labs and facilities within a two to three hour commute.

Wicomico County

With its strategic location at the crossroads of Maryland's Lower Eastern Shore, Wicomico County serves as a hub for commerce, industry, healthcare, education, and transportation. Wicomico County's policy for economic development has been the promotion of agriculture, industry, and trade and services. Although employment in the agriculture sector declined, farm income has shown a resurgence in recent years.

Major employers in the county include Peninsula Regional Medical Center, Salisbury University, and Perdue Farms, headquartered in Salisbury. Other major employers in Wicomico County include: Salisbury University, Verizon, Peninsula Regional Medical Center, The Knowland Group, and Pepsi Bottling of Delmarva. Other industries in Wicomico County include electronic component manufacturing, pharmaceuticals, shipbuilding, and agriculture.

St. Mary's County

St. Mary's County includes numerous bays and state parks making it a frequent tourist destination greatly contributing to the local economies. Military, manufacturing, healthcare, and retail/accommodation (associated with tourism) are major industries. Home to NAS PAX and over 200 high-tech defense contractors, St. Mary's County has emerged as a world-class center for maritime aviation, research, development, testing, and evaluation. The county is home to the highest percentage of high-tech employment in the region and the fastest growing county in Maryland. With the presence of BAE Systems, Wyle, CACI, Smartronix, Inc., Triton Metals, Sailing Specialties, Inc., Ship Point Machine Company, Inc., and other companies that produce innovative products for military, transportation, law enforcement, communications, and custom plastics, manufacturing is a small but growing component of the county.

The hospitality industry has also experienced growth as a result of NAS PAX's presence and the growing need for technology consultants and experts. Growth in housing, shopping, restaurants, hotels, recreation, arts, and

entertainment attracts new residents and supports the county's many historical sites. Current economic objectives and funding are oriented toward growth in education, transportation, and other infrastructure investments that support the Navy's expansion.

Somerset County

Somerset County's economy is historically based on the processing and distribution of seafood, poultry, produce, and other food products. The county seat of Princess Anne is home of the University of Maryland Eastern Shore, one of the largest employers in the county and offers a doctoral program in marine, estuarine, and environmental sciences. The county has Enterprise Zones in Crisfield and Princess Anne and participates in the One Maryland Program, which offers tax credits for capital investments that create jobs. Plans for a hotel conference center are moving forward along with the future development of an industrial park in the city of Crisfield. The Economic Development Commission is working to assist in the commercial development of the Crisfield waterfront and to attract aerospace industry. The major employers in Somerset County include the University of Maryland Eastern Shore campus, McCready Memorial Hospital, the Somerset County Development Center, and Sysco Eastern Maryland.

Northumberland County

Manufacturing is historically, and continues to be, the major industry in Northumberland County. The county is reliant on its abundance of natural resources and access to local waterways to maintain a positive fishing community. Manufacturing of seafood products provides the highest number of employment opportunities; however, more than 45 percent of the county's residents commute outside the county for employment. The county has many natural, recreational, and cultural assets to improve the job market and reverse or reduce the out-migration of workers.

The county's economic objectives include improvement of waterfront access and the use of shorelines to promote the growth of recreational based opportunities and tourism and to promote and attract jobs in occupations active during the winter and spring to increase year-round employment. New water-oriented enterprises that support tourism, sports fishing, commercial

fisheries, and other water related activities are encouraged at sites with deep water and appropriate access.

Westmoreland County

Westmoreland County's economy is historically dominated by occupations related to the use of natural resources. More recently, sales and service occupations have become the predominant contributor to the county economy; however, employment opportunities are severely limited due to many retirees and second home owners. The largest employers include the Westmoreland County School Board, Carry On Trailer Corporation, the County of Westmoreland, and Town of Colonial Beach School District. Westmoreland's economic development objectives include attracting more employers, jobs for young people, and higher-paying jobs by encouraging technology training programs within the existing educational facilities and support of the Northern Neck Tourism Commission to develop a more robust tourism industry.

2.4 Regional Development Overview

Land uses throughout the JLUS study area are defined by open space and agriculture with concentrated residential and urban population centers along major transportation corridors. The cities of Cambridge, Crisfield, and Salisbury, all located on Maryland's Eastern Shore and Leonardtown, located just west of NAS PAX are among the largest in the study area.

The area surrounding NAS PAX is a mix of agriculture, rural residential, and recreation use / open space uses. Urban development is in the major metropolitan areas of Washington, DC northwest of NAS PAX and Annapolis, MD north of NAS PAX. While these metropolitan areas may not be directly impacted by operations at NAS PAX, continued outward expansion of these urban areas into the counties surrounding the station may create future compatibility concerns.

NAS PAX is bounded to the north by the Patuxent River. Land north of the river in Calvert County is primarily rural with agricultural and residential uses. The eastern boundary of NAS PAX is the Chesapeake Bay. Land across the bay

from NAS PAX is characterized by the coastal marshes and lowlands sparsely inhabited and encompassed in the Blackwater National Wildlife Refuge, Fishing Bay Wildlife Management Area, and Deal Island State Wildlife Management Area. The area south of NAS PAX includes the rural countryside of St. Mary's County which continues to the Potomac River. The area is largely rural, with open space, agriculture, and limited residential uses. The western border of NAS PAX is the most developed including the communities of Lexington Park, Great Mills, California, Hollywood, and Leonardtown. These areas include multiple defense-related industries and are local population and economic centers for personnel associated with NAS PAX. These areas along the numerous state routes crossing the area are likely to experience the most development as the local population continues to grow.



3.1 Introduction

To appropriately develop and assess compatibility issues for the Naval Air Station Patuxent River Complex (NAS PAX) Joint Land Use Study (JLUS), it is critical to understand the military operations and activities associated with NAS PAX missions and how those operations interface with nearby communities. This chapter provides an overview of the NAS PAX mission operational footprint, including the operational areas and current operations at NAS PAX within the JLUS Study Area.

The mission operations performed within NAS PAX Main Station, Webster Outlying Landing Field (Webster Field), and operational areas extending beyond the property boundaries across the Chesapeake Bay [within the Atlantic Test Range's (ATR) Inner Test Range] are described to provide valuable insight into the importance of NAS PAX as a national strategic asset and its relationship with communities in the region. The purpose of providing this information is to enable stakeholders to make informed decisions about the future development and economic growth of communities proximate to NAS PAX that could potentially impact the viability and future role of the installation.

3.2 NAS Patuxent River Complex

The overall Patuxent River Complex includes NAS PAX Main Station, Webster Field, Naval Recreation Center Solomons, and the ATR Inner Test Range which includes the Bloodsworth Island Range (BIR). The NAS PAX Main Station is located adjacent to the Lexington Park area of St. Mary's County, Maryland and stretches across 25 miles of shoreline at the mouth of the Patuxent River, overlooking the Chesapeake Bay, 65 miles southeast of Washington, D.C., and 90 miles south of Baltimore, MD.

The NAS PAX Main Station occupies approximately 6,500 acres, and contains three runways and various support facilities such as hangars to accommodate the variety of aircraft.

Webster Field occupies approximately 900 acres of land 10 miles to the south of the Main Station in the community of St. Inigoes. Webster Field is characterized by a mix of forest, open field, wetlands, open waters, agriculture areas, and wildlife areas. Activities include helicopter, glider, UAS, and limited fixed-wing operations.

The ATR consists of two main operating areas - the Offshore Warning Area and the ATR Inner Test Range. Not included as part of this JLUS, the offshore range areas are collectively referred to as the Atlantic Warning Area. The Atlantic Warning Area is located east of the Delmarva Peninsula over the Atlantic Ocean consisting of three Warning Areas (W-386, W-378, and W-72) covering 30,000 square miles that provide use of airspace from surface to an unlimited altitude. Fleet Area Control & Surveillance Facility, Virginia Capes (FACSFAC VACAPES) maintains primary control over the Atlantic Warning Areas and the Naval Air Systems Command (NAVAIR) Range Department at NAS PAX maintains a partnership with FACSFAC VACAPES for use of the offshore areas.

The ATR Inner Test Range is an instrumented Navy range operating area. The ATR Inner Test Range overlies an area of approximately 2,360 square miles of land, airspace, and surface water in the middle portion of the Chesapeake Bay. Approximately 1,200 square miles (50 percent of the range) overlies land, a fraction of which is military controlled. Additionally, the BIR is situated in the middle of the Chesapeake Bay approximately 20 miles southeast of NAS PAX Main Station, and consists of four main islands: Bloodsworth, Pone, Adam, and Northeast, totaling approximately 6,013 acres.

3.3 Military Mission and Operations

The overall NAS PAX mission is to develop, deliver and sustain Navy and Marine Corps aircraft weapons and systems and serve as the Navy's principal research and development, test, evaluation, engineering and fleet support activity for naval aircraft and their support systems. NAS PAX serves as the Navy's Center for Aviation Excellence providing services in support of NAVAIR, Naval Air Warfare Center Aircraft Division (NAWCAD), and other activities and units as designated by appropriate authority.

Conducting over 150,000 air operations annually, NAS PAX hosts more than 50 tenants including three services, federal agencies, and private industry. Although NAVAIR and NAWCAD are the primary tenants at NAS PAX, the facilities are also used by foreign governments, academic institutions, and private industry for similar projects.

NAVAIR serves the Navy and the nation by developing, acquiring, and supporting aircraft and related systems that can be operated and sustained at sea. The NAVAIR mission is to provide full life-cycle support of naval aviation aircraft, weapons, and systems operated by the fleet. NAVAIR is a competency aligned organization and provides support to Naval Aviation Program Executive Officers and their assigned Program Management Air activities responsible for meeting the cost, schedule, and performance requirements of assigned programs. NAVAIR is also the principle provider for the Naval Aviation Enterprise.

The overall complex comprises 935 separate buildings, including 13 hangars, with a total of over 8.76 million square feet of facilities; five runways; 780 square miles of restricted airspace; and 5,000 square miles of controlled airspace.

Aircraft Operations

Various types of military testing and training takes place at NAS PAX and include both rotary-wing and fixed-wing aircraft and associated operations. As a test and training facility, NAS PAX supports over 35 independent aircraft types and models ranging from modern fighter aircraft to World War II vintage

aircraft, to UAS. As a research, development, acquisition, testing and evaluation (RDAT&E) facility, NAS PAX is constantly receiving new requirements for aircraft testing and integration.

Range Operations

NAVAIR's Range Department controls and manages airspace, aircraft operations, and the target areas within the ATR Inner Test Range. The open-air range and ground test facilities provide RDAT&E application for fleet and war fighter pre-deployment and readiness exercises. Range instrumentation includes acquisition, surveillance and tracking radar, special purpose electronic combat emitters, videographic and photographic instrumentation, laser tracking systems, optical tracking systems, infrared signature measurements, and dynamic cross section measurements. The Range Department is also responsible for the provision and management of flight test control and range safety functions and provides frequency coordination services throughout the Mid-Atlantic region. The ATR Inner Test Range supports a variety of aircraft, operations, and ordnance and operations that must be closely coordinated.

Radar Tracking and Dynamic Measurements of Flight Performance

NAS PAX is equipped with the Advanced Dynamic Aircraft Measurement System (ADAMS), the Navy's only outdoor radar measurement test range that performs radar measurements of targets in flight. These measurements are key to providing the DOD with decision quality information to ensure major weapon systems acquisition are meeting defined requirements and providing measurements to support system developments. This system provides a wide range of radar measurement capabilities that allows for real time data collection and response as the test is being conducted. ADAMS relies strictly on a subset of the 2,400 square miles within the Inner Test Range. This system relies on unobstructed ground and airspace within its viewshed in order for ADAMS to operate fully and accurately. Obstructions such as wind turbines with moving blades could render the system unable to complete its mission when located within the main beam of the radar.

3.4 NAS PAX Military Footprints

Mission and testing activities conducted by NAS PAX generate a number of impacts that can affect the health, safety, and overall quality of life in the surrounding community. Examples of these mission impacts include noise and vibration from overhead flights or the risk of an aircraft accident. Conversely, the military mission is susceptible to hazards created by certain nearby civilian activities and land use development that may obstruct air space or locate noise sensitive uses in high noise zones. Understanding the overlapping spatial patterns of these impacts within military operational areas is essential for promoting compatible and informed land use decisions.

Several elements or mission profiles comprise the mission footprint that extends outside the NAS PAX and Webster Field property boundaries. The following outlines the different elements or mission profiles that comprise the NAS PAX military footprint:

- ATR Inner Range
- Radar Instrumentation View Shed
- High Risk of Adverse Impact Zone (HRAIZ)
- Runway Class Airspace
- Restricted Airspace
- Military Training Routes
- Helicopter Operating Areas
- UAS Operating Areas
- Supersonic flight operating areas
- Aircraft Safety Zones
- Aircraft Noise Contours
- Imaginary Surfaces
- Part 77 Obstruction Evaluation Area
- Bird / Wildlife Air Strike Hazard (BASH)

Atlantic Test Range Inner Test Range- Targets

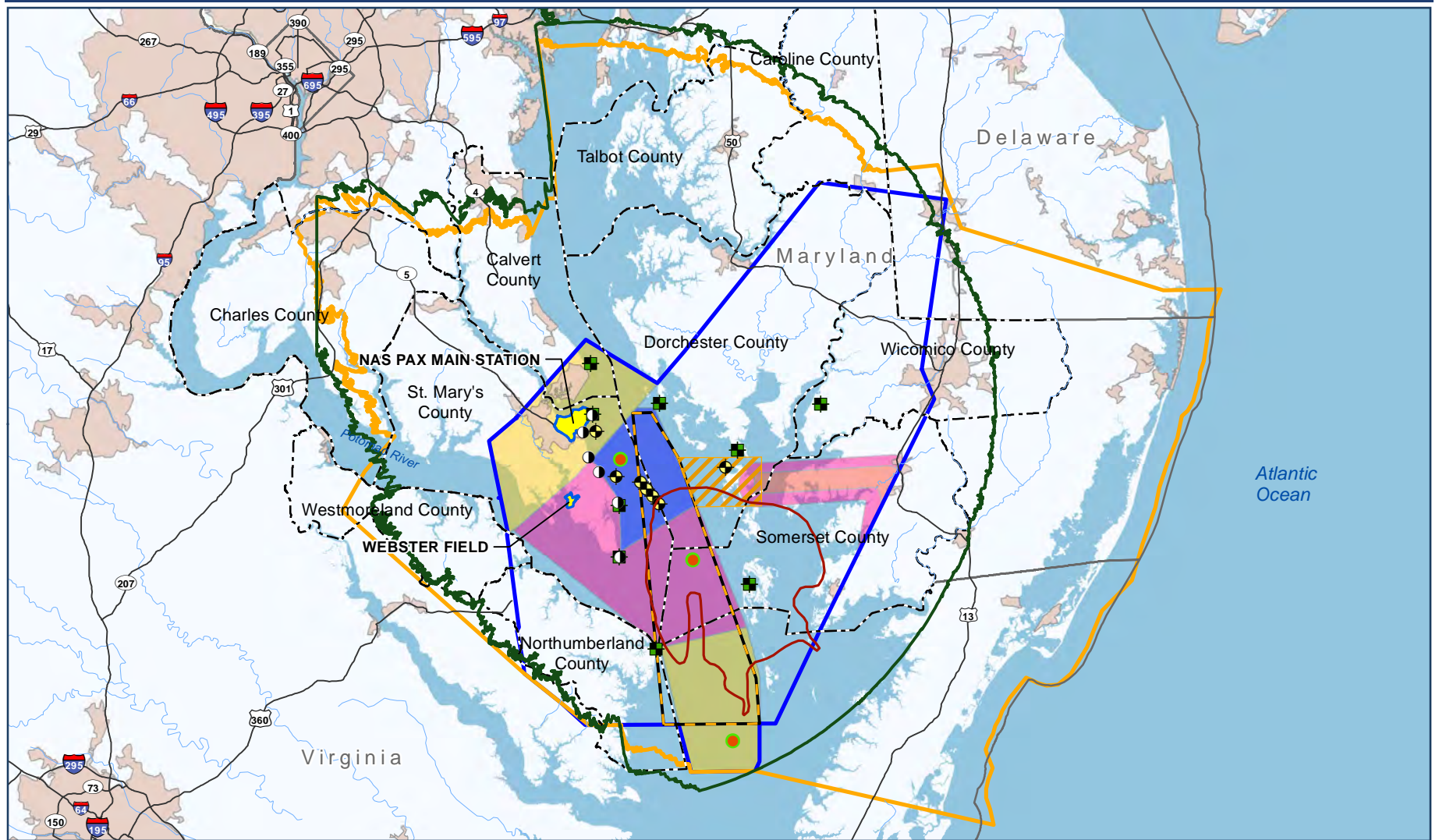
As illustrated on Figure 2, the ATR Inner Test Range consists of selected targets and airspace covering regions over the Chesapeake Bay, Maryland, Delaware, and Virginia. The ATR controls an aerial firing range and two exclusive-use surface target areas in the ATR Inner Test Range restricted areas. Webster Field is used as an auxiliary field for daylight testing and is the primary test area for UASs. The ATR provides real-time connectivity to:

- NASA Wallops Flight Facility
- Fleet Area Control and Surveillance Facility, Virginia Capes
- NAVAIR simulation and stimulation laboratories
- Other NAVAIR and DOD major test ranges

The ATR Inner Test Range contains three exclusive-use surface target areas: the Hooper Target, Hannibal Target, and Tangier Island Target (no longer in use). The surface target areas provide a safe, controlled location where air-to-surface firing and weapon separation testing can be conducted. An integrated network of cinetheodolites (an instrument located throughout the test range used for visual tracking of aircraft and for accurate multi-target tracking), laser and radar trackers, data acquisition, and scoring systems provide the capabilities for diverse testing and training scenarios within the range. Each of these target areas are surrounded by a prohibited area of 1,000 yards in radius which are delineated on navigation charts. Vessels are prohibited from entering these areas at all times unless authorized by NAS PAX.

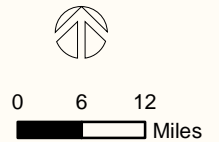
The Hooper and Hannibal targets and associated prohibited areas are surrounded by the aerial and surface firing range, which is open to navigation except during Navy exercise. The aerial and surface firing range overlies the main shipping channel. Due to the shallow depths near the targets, larger commercial vessels are unable to approach the targets; however smaller vessels such as fishing boats, tugboats, and recreational craft, are able to maneuver up to the limits of the prohibited areas and within most of the restricted area comprising the aerial and surface firing range.

Naval Air Station Patuxent River Joint Land Use Study



Legend

- | | | | | | |
|---------------------|--|--------------------|-----------------------------------|-------------------------|------------|
| Target Centers | CDNL Contour | Noise Zones | ADAMS Radar Viewshed | Installation | Water Body |
| Sonic Aim Points | Bloodworth Island Range | 45 - 50 dB | High Risk For Adverse Impact Zone | City/Community | Highway |
| Sonic Boom Monitors | Aerial Firing/Weapons Separation Testing | 50 - 55 dB | ATR Inner Range | County Boundary | River |
| Theodolites | | 60 - 65 dB | | State/District Boundary | |
| | | 65 - 70 dB | | | |



Sources: ESRI, 2010; NAS Pax, 2010
 NAS_PAX_Fig2_Range_Footprint_20141211_CJM.pdf

Figure 2
Range Footprint Composite

Bloodsworth Island Range

The BIR includes the restricted land and surrounding restricted waters of its surface danger zone. The surface danger zone covers approximately 26 square miles of surface water. A variety of targets including billboard-type signs, radar reflectors, simulated weapons platforms (e.g., full-size molded plastic tanks), discarded military and civilian vehicles (after removal of oil and gas), and other equipment are located on the BIR. These targets are used for the purposes of conducting range operations involving aviation-related RDAT&E within the SUA overlying the BIR. The RDAT&E aircraft operations include overflights of Bloodsworth Island; however, ordnance or other expendables are not released from the test aircraft. The targets on the BIR allow aircrews to learn how to sight and recognize ground-based threats. NAS PAX maintains existing targets including the replacement and/or relocation of targets on to meet specific RDAT&E requirements and conducts routine maintenance of the BIR's natural and cultural resources. Because of past exercises at BIR, the island contains unexploded ordnance making it a hazard to the general public. Access to the public is restricted.

Aircraft Noise Contours: ATR Inner Test Range

Noise associated with airspace from such areas as Restricted Areas, MOAs, and MTRs are described differently than the noise metrics used to measure noise exposure in the vicinity of an air station or airfield. Military aircraft conduct training and maneuvers over land and water at low altitudes and high speeds often seeming to appear out of nowhere (producing a great amount of noise and then quickly disappearing). A modified noise metric to appropriately account for these factors utilizes the Sound Exposure Level (SEL) and adjusted DNL metrics that account for the "surprise" or "startle" effect of the onset rate of aircraft noise on humans. Onset-Rate Adjusted SEL is denoted SEL_r and the adjusted DNL for the busiest month of the year is denoted as Onset-Rate Adjusted DNL (Ldnmr).

Because of the sporadic occurrences of aircraft events, the number of average daily operations is determined from the number of flying days in the calendar month with the highest number of operations in the airspace of interest. This metric is designated as Ldnmr, which is used as the primary metric for defining environmental noise occurring in the ATR Inner Test Range. Given the

nature of the use of the ATR Inner Test Range, noise is measured for aircraft travelling at both subsonic and supersonic speeds. The noise model used for predicting aircraft noise from aircraft operating in three types of airspace: MOAs, MTRs, and Range/Restricted Areas are referred to as MR NMAP.

Subsonic Noise Contours

The modeled noise levels for the subsonic operations in the ATR Inner Test Range are based on MR NMAP model used to calculate and plot Ldnmr contours of 65 dB. Based on the resulting levels of planned aircraft activity, the area contained within the Ldnmr contour 65 dB is considered to be within Noise Zone II, an area where there is moderate noise impact. All other areas outside an Ldnmr contour of 65 dB and are considered to be in Noise Zone I, which is subject to minimal or no noise impacts from operations within the ATR Inner Test Range.

Supersonic Noise and Sonic Booms

Supersonic flight events can result in audible sonic booms. A sonic boom is an impulse sound, often occurring with no warning, similar to the sound of thunder or a double gunshot. Depending on the altitude of the aircraft and the air temperature, the path that the noise will travel on is downwards and away from the aircraft and can be altered enough so that it does not reach the ground.

The two metrics most used for quantifying sonic booms are Peak Overpressure and C-Weighted Day Night Average Sound Level (CDNL). The sonic boom Peak Overpressure is described in pounds per square foot and is used to describe the change in air pressure on the ground. The Peak Overpressure is also referred to as the amplitude of the sonic boom. Its value depends on the aircraft's size, weight, geometry, Mach number, and flight altitude. As a result, aircraft in maneuvering flight generate sonic booms of different amplitudes than aircraft in level flight. The second metric is the CDNL, which is similar to DNL, except for the frequency weighting. The human ear is not uniformly sensitive to all frequencies, thus the C-weighting scale, which is nearly flat throughout the range of audible frequencies, approximates the human ear's sensitivity to higher intensity sounds. C-weighting is generally used to quantify high-energy impulsive noise (e.g., sonic booms, detonation of

high explosive materials). The CDNL noise contour for the ATR Inner Test Range is also shown on Figure 2.

These events are monitored to determine if the surrounding community is impacted. Events are tabulated according to altitude [above or at Flight Level (FL) 300 and below FL300], since these altitudes require different supersonic operational procedures. Supersonic Noise Contours represent supersonic operations within the ATR Inner Test Range. The most recent noise models for these events are based on an average of five sonic booms occurring per month within the range. The resulting levels are concentrated within the southeast area of the Restricted Areas, and farther southeast, in a stretch 50 to 100 nautical miles southeast of NAS PAX Main Station. The majority of sonic booms are concentrated over the Restricted Areas; however, long stretches of supersonic flights southeast of the air station (within MTRs VR 1711 and VR 1712) at 10,000 feet MSL and Mach numbers of 1.2 or 1.3 result in the 40 dB CDNL contour 50 to 100 nm southeast of the station.

Line of Sight High Risk of Adverse Impact Zone

The Line of Sight footprint is defined as the area in which electromagnetic waves or acoustic waves are transmitted or spread to various communication sites by simple unobstructed horizontal planes. This horizontal plane is at a certain height and allows for a clear, unobstructed pathway for the transmission of electromagnetic waves.

Depending on the structure's height and distance from the station, obstructions built within the radio frequency line of sight of RDAT&E systems and ATC radars may have a significant adverse impact to RDAT&E activities and ATC services provided by NAS PAX. Sites that require clear line of sight in order to avoid adverse impacts to systems these systems may be designated by the DOD as a High Risk of Adverse Impact Zone (HRAIZ). The HRAIZ associated with NAS PAX and the ATR encompasses the radar instrumentation viewshed as depicted in Figure 2 and extends to the Atlantic Warning Area.

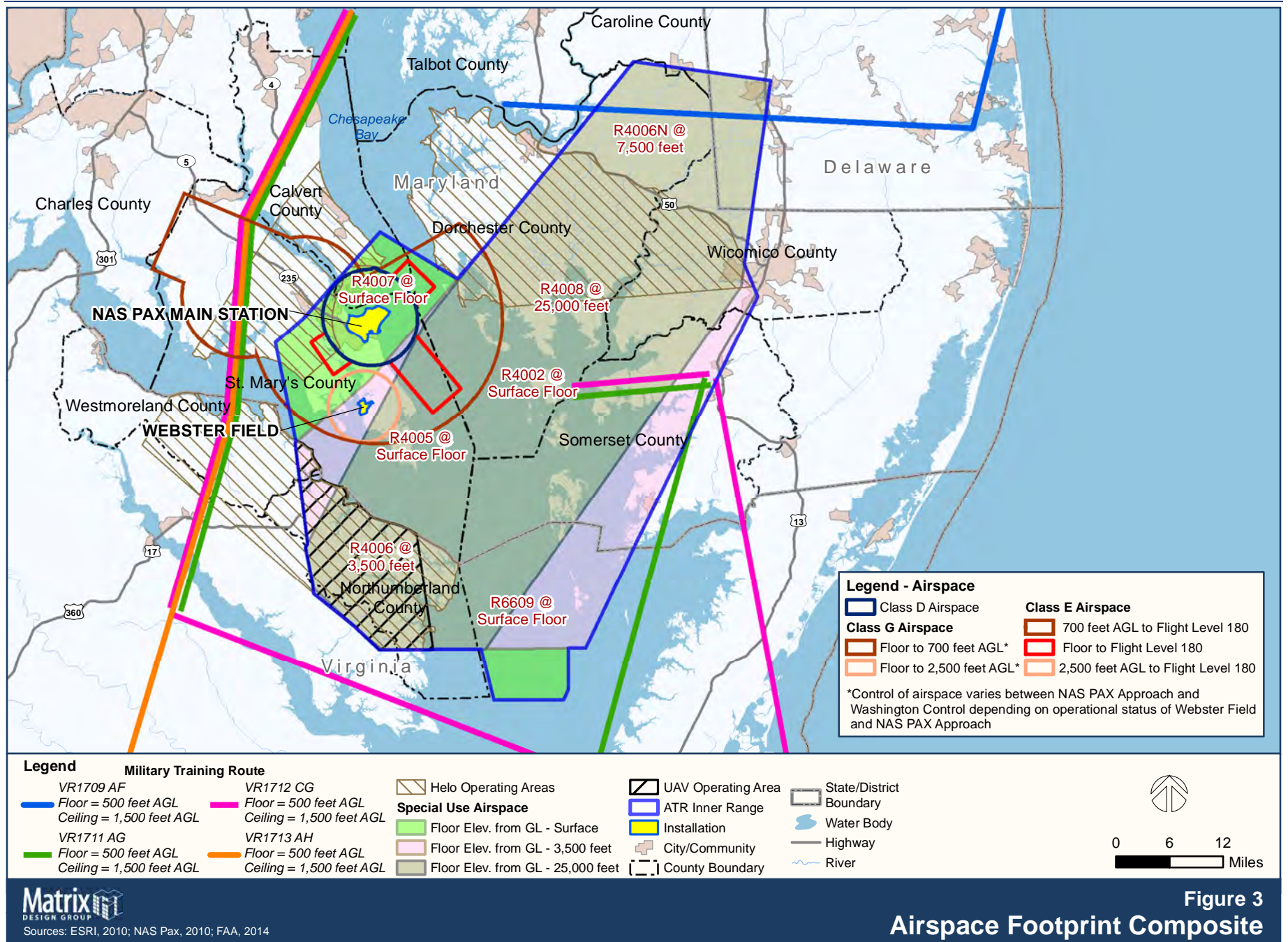
Runway Class Airspace

Class D Airspace - NAS PAX Main Station

NAS PAX Class D Airspace encompasses an area within a 4.5-mile radius of the center of the airfield that extends upward to 2,500 feet mean sea level (MSL). Use of Class D airspace requires the use of two-way communication with Air Traffic Control, which must be established prior to entering Class D airspace. No transponder is required. Visual Flight Rules (VFR) flights in Class D airspace must have three miles of visibility, and fly an altitude at least 500 feet below, 1,000 feet above, and 2,000 feet laterally from clouds. There are two areas of controlled Class E airspace surrounding the airfield. One set of Class E airspace radiates in three rectangles from the Class D airspace from an elevation of floor to a ceiling of Flight Level 180 or generally 18,000 feet MSL. Outside of the Class D airspace and the Class E airspace rectangles is a larger area of Class E airspace that encompasses Webster Field and extends from an elevation of 700 feet above ground level (AGL) to Flight Level 180. The Class D airspace reverts to the Class E airspace when the ATC is closed or during other special conditions. The airspace surrounding the Main Station airfield is depicted on Figure 3.

Class E Airspace - Webster Field

Webster Field is located within Class G / E airspace that is controlled by surrounding towered and non-towered airports depending on their operational status. The Webster Field airspace encompasses an area within a 4-mile radius of the center of the airfield. The Class G airspace extends from floor to 2,500 feet AGL. When Webster Field is open or closed and NAS PAX Approach is open, this airspace is controlled by NAS PAX Approach. When both Webster Field and NAS PAX Approach are closed, the Class G airspace is under the control of Washington Center. The Class E airspace extends from 2,500 AGL to Flight Level 180. When Webster Field is open or closed and NAS PAX Approach is open, this airspace is controlled by NAS PAX Approach. When both Webster Field and NAS PAX Approach are closed, the Class G airspace is under the control of Washington Center. Both VFR and instrument flight rules (IFR) flight is permitted in Class E airspace and communication with air traffic control is not required for VFR flights.



NAS_PAX_Fig3_Airspace_Footprint_20141217_CJM.pdf

The airspace above Webster Field is also designated as Restricted Airspace (R) which when activated, restricts designated airspace to military use. The parameters of Restricted Airspace are described below. Both R-4005 and R-4006 overlie Webster Field. The Class G / E airspace for Webster Field are depicted on Figure 3.

Restricted Airspace

Special Use Airspace (SUA) is airspace where military activity or unusual flight conditions may occur. The designation of SUA serves to alert a nonparticipating aircraft (civilian or military) to the possible presence of these activities. There are six SUA types: Alert Areas, Prohibited Areas, Controlled Firing Areas, Military Operating Areas (MOAs), Restricted Areas, and Warning Areas. Only Restricted Areas are designated within the ATR Inner Test Range.

Restricted Airspace designate areas where ongoing or intermittent activities occur that create usual and often invisible hazards to aircraft. Restricted airspace is specifically designated in areas where flight or ground activities must be confined because of their nature, which may be considered hazardous to nonparticipating aircraft. Restricted airspace is bounded by a floor (minimum altitude a plane can fly) and a ceiling (maximum altitude a plane can fly). Air-to-ground weapons can only be released within a Restricted Area that has a floor of surface level. When restricted airspace is being used for military training, non-participating military, as well as all civilian aircraft, are prohibited from flying through it. When restricted airspace is not being used for military operations, civilian and commercial access through the airspace may be requested from airspace-controlling agency that controls that particular area.

The ATR Inner Test Range Restricted Airspace consists of R-4002, R-4005, R-4006, R-4007, R-4008, and R-6609, the parameters of which are provided in Table 5 and illustrated on Figure 3.

Table 5. Restricted Airspace

Restricted Area	Minimum Altitude feet	Maximum Altitude feet	Area Covered sq. miles
R-4002	Surface	20,000	53
R-4005	Surface	25,000*	419
R-4006	3,500	7,500*	1,816
R-4006N	3,500	7,500*	113
R-4007	Surface	4,999*	216
R-4008	25,000	85,000	1,722
R-6609	Surface	20,000	165

*Up to but not including

Source: NAS PAX RAICUZ, 2009.

Generally, a maximum of 10 aircraft may occupy the range airspace in R-4005, R-4006, and R-4008 during normal operating hours of 7:00 a.m. to 11:00 p.m. Aircraft may be distributed among the different altitudes, ranging from surface to 85,000 feet above sea level. Airspace and surface targets are used for test and evaluation of aircraft and for warfighter training missions. In addition to radar and optical tracking systems, fixed and mobile assets provide the necessary capabilities for diverse testing and training scenarios.

Military Training Routes

Due to the unique nature of military training and testing requirements, Military Training Routes (MTRs) for special military use has been allocated for use by NAS PAX. The MTRs are flight corridors used to practice low-altitude, high speed, terrain-following training missions. Generally, MTRs are established below 10,000 feet MSL for operations at speeds in excess of 250 knots. Each segment of an MTR is allocated a floor altitude (at the earth's surface or any altitude above the surface) and a ceiling altitude with lateral boundaries.

Lateral boundaries are indicated in nautical miles to the left and right of the centerline. Aircraft may freely maneuver within the lateral and vertical confines of the MTR segment or block. Figure 3 shows the MTRs associated with NAS PAX. Parameters for each of these MTRs are listed in Table 6.

Table 6. Military Training Routes Associated with NAS PAX

MTR	Floor (feet AGL)	Ceiling (feet AGL)
VR-1711 AG	500	1,500
VR-1712 CG	500	1,500
VR-1713 AH	500	1,500
VR-1709AF	500	1,500
VR-1709CD	500	1,500
VR-1709DG	100	1,500
VR-1709GH	1,300	1,500
VR-1709HJ	400	1,500

Source: NAS PAX RAICUZ, 2009.

Helicopter Operating Areas

The East, South, and West Helicopter operating areas are located over portions of Maryland's Eastern Shore, Southern Maryland, and the Northern Neck of Virginia, respectively. These operational areas depicted on Figure 3 are primarily used for low-level helicopter and low performance fixed-wing aircraft operations. Ordnance release is not authorized within these areas.

Unmanned Aerial Systems Operating Area

As shown on Figure 3, NAS PAX's UAS Operating Area consists of a constricted area of the ATR Inner Test Range over the Northern Neck of Virginia. The northernmost point that extends over land is located along the shoreline just south of Coles Point in Westmoreland County. The UAS Operating Area limits extend south passing just east of Callao, VA at which point it turns to the southeast toward the Hughlett Point Natural Area. This area was originally

established to easily segregate unmanned from manned flight operations. Low level UAS activities occur on a daily basis in this area.

Supersonic Flight Operating Areas

Supersonic flight operations are conducted in an area over the Atlantic Ocean within the Atlantic Warning Areas referred to as the supersonic test track. The test track runs from near Ocean City to Wallops Island and can be as close as three miles or up to 20 miles from shore. Although this supersonic test track is located within the Atlantic Warning Area, which is located to the east outside of the JLUS Study Area, aircraft must traverse the Chesapeake Bay from its northernmost point near Lexington Park to its southernmost point lining up with Reedville in Northumberland County to reach the warning areas. Supersonic flight operations take place within the limits of R-4005 and R-4006. The primary use of this airspace is for supersonic test flights under 30,000 feet associated with weapons separation events, which require tracking by optical and/or telemetry equipment. Inert ordnance releases are permitted only in approved target areas. Supersonic flights can occur outside of the corridor above 30,000 feet within the restricted airspace.

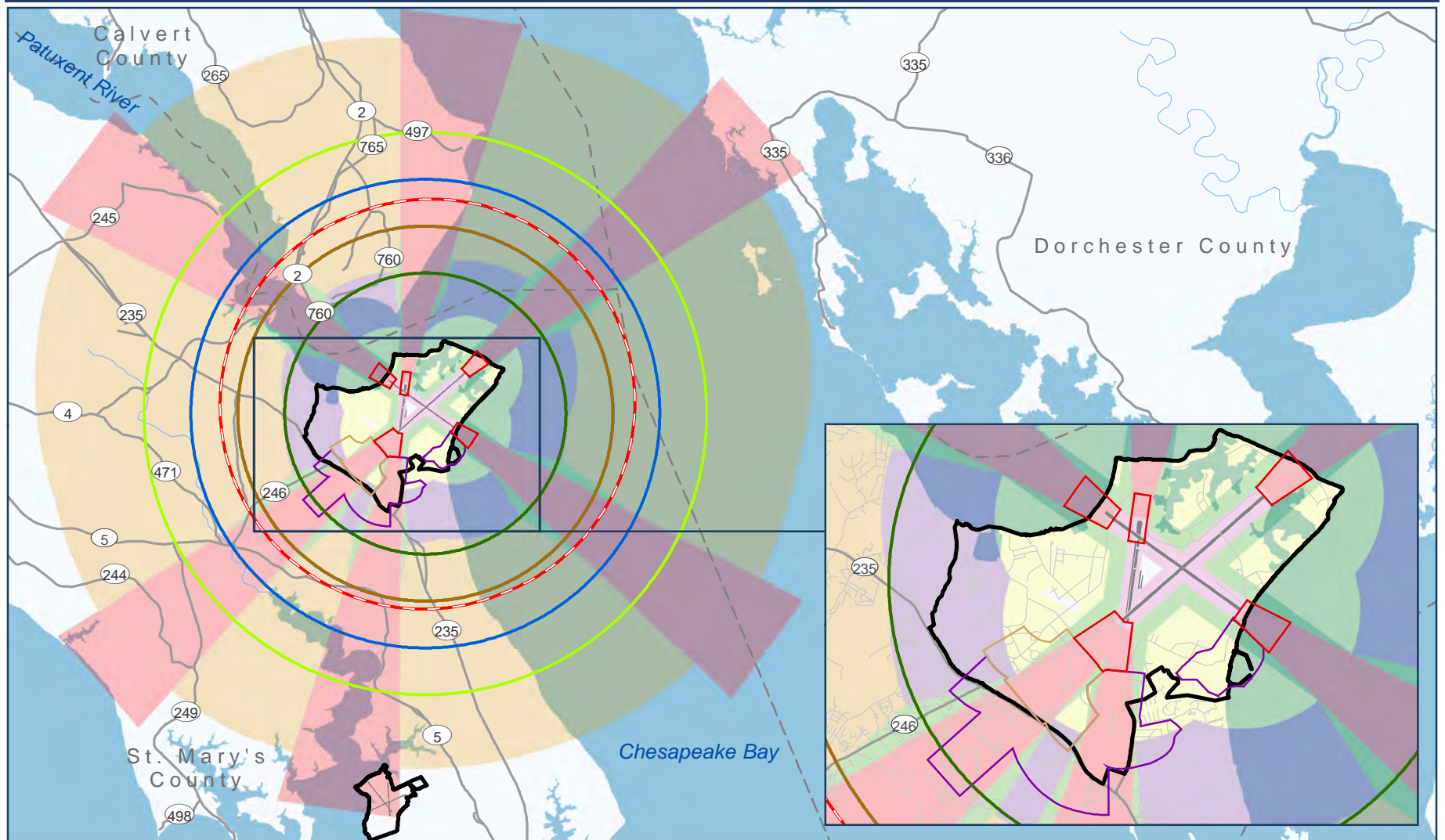
NAS PAX Main Station Military Footprints

Aircraft Safety Zones: NAS PAX Main Station

The 2009 NAS PAX AICUZ report establishes aircraft safety zones for NAS PAX runways (Class B) based on historical data of aircraft collisions, geography, and runway information. Following is a brief description of these safety zones, which include Clear Zones (CZ), and Accident Potential Zones (APZ) I and II. The safety zones are illustrated on Figure 4.

APZs extend from the end of the runway but apply to the predominant arrival and departure flight tracks used by the aircraft. Outside the CZ, APZ I, and APZ II, the risk of aircraft accidents is not significant enough to warrant special consideration in land-use planning. In addition to the CZ, there is a lateral Clear Zone (called the primary surface) that extends outward for 500 feet on each side, and for the length of, the runway.

Naval Air Station Patuxent River Joint Land Use Study



Legend

Imaginary Surfaces

- Approach / Departure
- Conical Surface
- Inner Horizontal Surface
- Primary Surface
- Transitional Surface
- Outer Horizontal

FAA Part 77

- Up to 200' @ 3NM
- Up to 300' @ 4NM
- Up to 400' @ 5NM
- Up to 500' @ 6NM

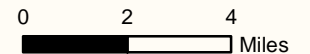
Safety Zones

- CZ
- APZ-I
- APZ-II

5-mile BASH Relevancy Area

- Installation
- County Boundary

- Runway
- Water Body
- Highway
- Road



Sources: ESRI, 2010; NAS Pax, 2010

Figure 4
Main Station Footprint Composite

NAS_PAX_Fig4_MainStationFootprint_20141211_CJM.pdf

Aircraft Noise Contours: NAS PAX Main Station

Noise contours associated with the NAS PAX Main Station were developed in 2009 based on existing and projected aircraft and are illustrated on Figure 5. These contours were determined to be largely the result of the straight-in arrivals of F/A-18C/D, F/A-18E/F and projected operations from the F-35 aircraft. The relatively high noise levels near the runways (greater than a DNL of 85 dB) result from departure operations by the major noise contributors, such as the F/A-18C/D, F/A-18E/F and F-35 operations.

The majority of the acreage encompassed by the Noise Zone I contour is located over Navy-owned property or water. A total of 2,366 acres of land off-station are affected by Noise Zone I, including the southern portion of Calvert County where the Chesapeake Range Estates are located and to the southwest and southeast of the installation into portions of the Lexington Park community of St. Mary's County. All portions of Noise Zone II are either entirely contained within the installation boundary or occur over water.

A small portion of Noise Zone II extends approximately to the southernmost portion of Chesapeake Range Estates in Calvert County. A total of 1,226 acres of land to the southwest and southeast of the installation into portions of the Lexington Park community of St. Mary's County are also affected by Noise Zone II. Fourteen acres of off-station land in the Lexington Park area near Three Notch Road experience noise levels greater than 75 dB.

Imaginary Surfaces Class B Runway: NAS PAX Main Station

The Federal Aviation Administration (FAA) has identified certain imaginary surfaces around runways to determine how structures and facilities are evaluated for creating vertical obstructions relative to the surrounding airspace associated with an active airfield. The imaginary surfaces build upon each other and are designed to eliminate obstructions to air navigation and operations, either natural or man-made. Each type of imaginary surface has different dimensions and planes or slopes in which a structure intruding upon it may be considered a vertical obstruction. Figure 4 illustrates the imaginary surfaces for the NAS PAX Main Station.

Federal Aviation Act (Part 77) Obstruction Evaluation

Separately from and in addition to the DOD-established imaginary surfaces, the FAA also established guidance to reduce the potential for accidents surrounding an airfield. This guidance is codified in the Code of Federal Regulations at Title 14, Part 77.17 and utilized by the FAA during obstruction evaluations. The guidance and process for obstruction evaluation is more fully detailed in Section 4: Existing Tools as it is not a military-specific element and is not a direct result of NAS PAX operations. It is included here, within the military profile, nonetheless, because it is associated with the NAS PAX airfield. Figure 4 illustrates NAS PAX Main Station Part 77 relevancy areas.

Bird/Aircraft Strike Hazard

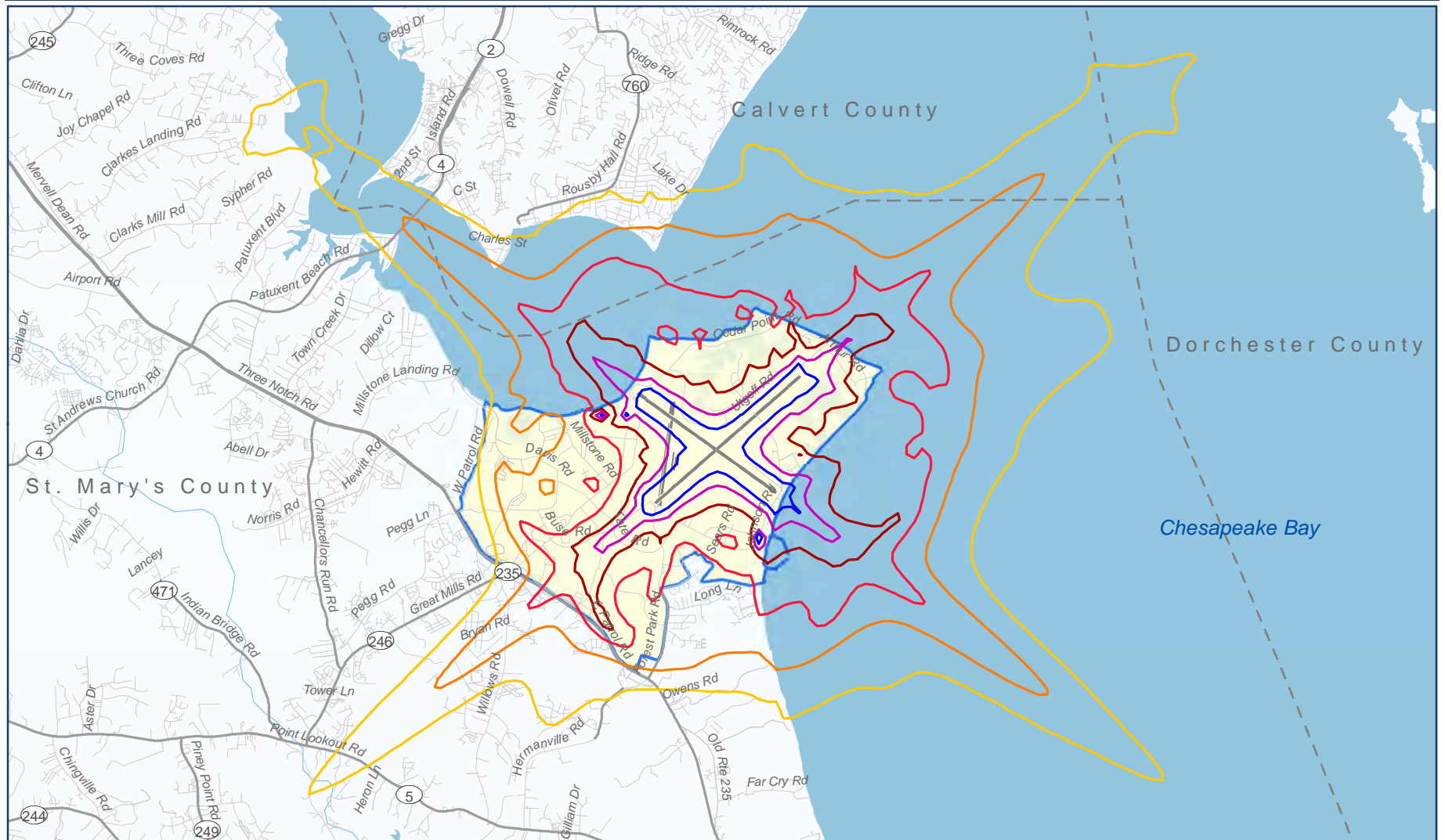
NAS PAX has a variety of facilities and natural areas that inadvertently provide ideal nesting and roosting spots for a variety of birds. A bird/aircraft strike hazard (BASH) program has been adopted by NAS PAX to reduce the impact of birds on aircraft operations. As a result, NAS PAX has made its BASH program its highest natural resources management priority. NAS PAX's active program to reduce exposure to bird and animal hazards on and around the airfield has resulted in minimal BASH incidents. Figure 4 illustrates the FAA statistical BASH relevancy area around NAS PAX Main Station.

Webster Field Military Footprints

Aircraft Safety Zones: Webster Field

All runways at Webster Field are Class A because of the types of aircraft using the runways. The CZ is the area that extends from the end of the active runway measuring 1,000 feet wide and 3,000 feet in length. Clear zones are designated for all active runways; however, APZs are only assigned to runways with at least 5,000 arrivals or departures. Due to the low number of fixed-wing operations that occur at Webster Field, there are only CZs associated with the airfield. Webster Field's rotary wing APZs are contained within the fixed-wing primary surface and/or runway clear zones. The designation of APZs are being considered and programmed for Webster Field by the Navy as allowed by the OPNAVINST 11010.36C.

Naval Air Station Patuxent River Joint Land Use Study



Legend

- | | | |
|----|-----------------|------------|
| 75 | Installation | Water Body |
| 60 | County Boundary | Highway |
| 65 | Runway | Road |
| 70 | 85 | |



0 1 2 Miles

Matrix
DESIGN GROUP
Sources: ESRI, 2010; NAS Pax, 2010

Figure 5
Main Station Noise Footprint

NAS_PAX_Fig5_MainStatNoiseFootprint_20141211_CJM.pdf

Webster Field's CZs, illustrated on Figure 6, extend beyond the airfield perimeter. The CZs extending to the northwest and southwest only occur over water. Approximately 65 acres of land used for mixed forest, cropland, and low-density residential are affected by the CZs extending to the northeast and southeast of the airfield.

Aircraft Noise Contours: Webster Field

The main noise source at Webster Field is aircraft operations, primarily by helicopter operations. Although Webster Field also serves as a detachment for UASs, the systems accessing Webster Field generate minimal levels of noise, thus Webster Field's noise contours are largely a result of rotary-wing operations centralized on the helicopter pad. As shown on Figure 6, portion of Noise Zone I extend outside the Webster Field boundaries over the St. Inigoes residential area. Noise Zone II is entirely contained within Webster Field and noise levels greater than 75 dB have not been recorded for operations at Webster Field.

Imaginary Surfaces Class A Runway: Webster Field

The Federal Aviation Administration (FAA) has identified certain imaginary surfaces around runways to determine how structures and facilities are evaluated for creating vertical obstructions relative to the surrounding airspace associated with an active airfield. The imaginary surfaces build upon each other and are designed to eliminate obstructions to air navigation and operations, either natural or man-made. Each type of imaginary surface has different dimensions and planes or slopes in which a structure intruding upon it may be considered a vertical obstruction. Figure 6 illustrates the imaginary surfaces for Webster Field.

Federal Aviation Act (Part 77) Obstruction Evaluation

Separately from and in addition to the DOD-established imaginary surfaces, the FAA also established guidance to reduce the potential for accidents surrounding an airfield. This guidance is codified in the Code of Federal Regulations at Title 14, Part 77.17 and utilized by the FAA during obstruction evaluations. The guidance and process for obstruction evaluation is more fully detailed in Section 4: Existing Tools as it is not a military-specific element and is not a direct result of NAS PAX or Webster Field operations. It is included

here, within the military profile, nonetheless, because it is associated with Webster Field. Figure 6 illustrates Webster Field's Part 77 relevancy areas.

Bird/Aircraft Strike Hazard

NAS PAX and Webster Field have a variety of facilities and natural areas that inadvertently provide ideal nesting and roosting spots for a variety of birds. A bird/aircraft strike hazard (BASH) program has been adopted by NAS PAX to reduce the impact of birds on aircraft operations. As a result, NAS PAX has made its BASH program its highest natural resources management priority. NAS PAX's active program to reduce exposure to bird and animal hazards on and around the airfield has resulted in minimal BASH incidents. Figure 6 illustrates the FAA statistical BASH relevancy area around Webster Field.

Naval Air Station Patuxent River Joint Land Use Study

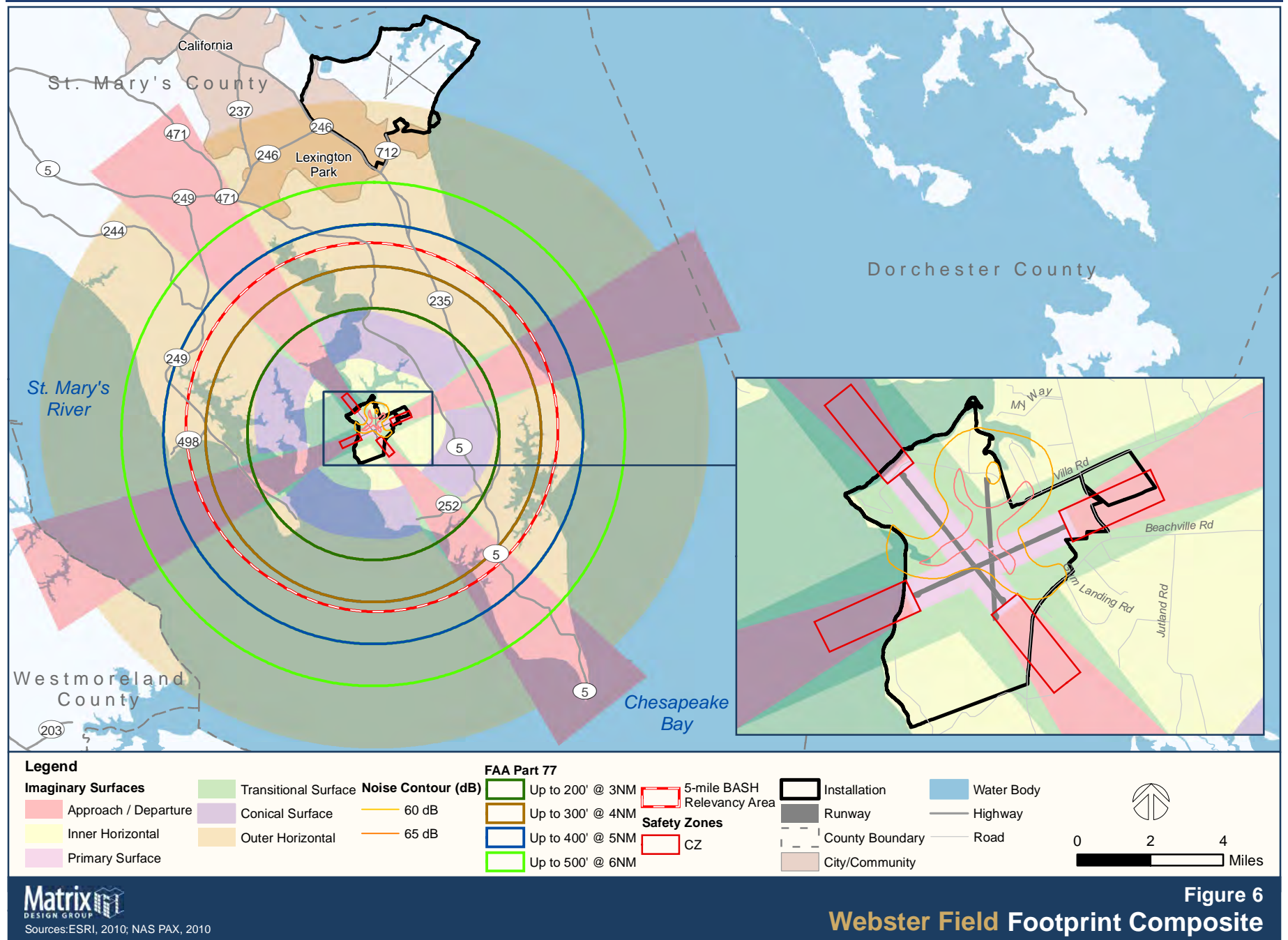


Figure 6
Webster Field Footprint Composite

NAS_PAX_Fig6_WebsterFootprint_20141211_CJM.pdf



4.

EXISTING COMPATIBILITY TOOLS

4.1 Introduction

There are numerous existing tools that can be used to encourage, promote, and manage compatibility between military installations and their neighboring communities. These tools exist at the federal, installation, state, regional, and local level and are used for compatibility purposes to guide every day land use and operational decisions in communities and on military installations.

The following pages list some of the key tools that are currently, or are recommended to be more efficiently, utilized or enhanced for the compatibility issues identified by the Naval Air Station Patuxent River Complex (NAS PAX) Joint Land Use Study (JLUS) process. The tools listed in this section are not exhaustive, but are meant to provide a brief overview of the primary tools currently utilized in the JLUS Study Area.

4.2 Federal Plans and Programs

Air Installations Compatible Use Zones

The United States Department of Defense (DOD) initiated the Air Installations Compatible Use Zones (AICUZ) program to assist government entities and communities in anticipating, identifying, and promoting compatible land use and development near military installations with aircraft activity. The AICUZ program involves coordinating the efforts of installation commanders and local community leaders and other government agencies to encourage compatible development of land in proximity to military airfields. It also serves to protect the health, safety, and welfare of civilians and military personnel by encouraging land development compatible with aircraft operations, while protecting the public investment in the installation. This program recommends compatibility measures and land uses that are compatible with

specific elements of military airfields including elevated sound levels, accident potential zones, and obstruction clearance criteria.

The most recent AICUZ studies were completed for NAS PAX Main Station in 2009 and for Webster Field in 2006. The noise contours and safety zones identified in the AICUZ studies are shown in chapter 3 Military Profile of this JLUS.

Federal Aviation Act, Title 14, Part 77

FAA Regulation Title 14 Part 77, commonly known as Part 77, provides the basis for evaluation of vertical obstruction compatibility. This regulation determines compatibility based on the height of proposed structures or natural features in relation to their distance from the ends of a runway. Using the distance formula from this regulation, local jurisdictions can easily assess height restrictions near airfields. The main focus of Part 77 is to establish standards to determine obstructions within navigable airspace, typically within a certain distance from an airport or airfield, and although it is not a military specific component, it also applies to military airfields. The vertical obstruction relevancy areas for each airfield that adheres to these regulations are shown in maps in Chapter 3.

Separate from Part 77, the FAA has further identified certain imaginary surfaces around runways to determine how structures and facilities are evaluated and whether they pose a vertical obstruction in relation to the airspace associated with a runway. NAS PAX Main Station and Webster Field both employ imaginary surface zones to assist in the deconfliction of airfield vertical obstructions.

Navy Encroachment Management Program

An Encroachment Action Plan (EAP) is an important tool that is developed as a blueprint for an installation or range's Encroachment Management Program. An EAP is designed to identify, quantify, assess, and provide recommendations to mitigate or prevent encroachment impacts around Navy installations. An EAP responds to the requirements of the Navy Encroachment Management Program as described in OPNAVINST 11010.40. Encroachment is primarily any non-Navy action planned or executed which inhibits, curtails, or possesses the potential to impede the performance of Navy activities. An EAP provides the host installation with a methodological approach to address existing and potential encroachment that may impact the Navy's mission. This includes regularly sharing information, analysis, and insights relevant to encroachment and the requirements of current and future test and training operations. Each Navy installation utilizes its EAP to support the analysis and implementation of encroachment mitigation efforts.

NAS PAX's EAP was most recently completed in July 2007 and is currently in the process of being updated. The EAP is actively maintained and serves as an internal encroachment monitoring and management plan for the installation.

Range Air Installations Compatible Use Zones

A Range Air Installations Compatible Use Zones (RAICUZ) study is a DOD program used to identify safety zones and noise contours associated with military-related operations and training exercises such as weapons delivery and target bombing practice conducted on a range. The primary purpose of a RAICUZ study is to provide local government and land management agencies with recommended land uses to protect the general welfare of the public from impacts related to military training and operations and preserve the viability of the military mission and readiness. The most recent RAICUZ Study for the Chesapeake Test Range was completed in 2009 and contains recommendations on how to achieve several critical objectives of the RAICUZ program.

Readiness and Environmental Protection Initiative

The Readiness and Environmental Protection Initiative (REPI) was authorized by Congress to financially assist the military services in working with other government agencies, including local governments, to establish buffers around military installations. In an effort to protect the future use of installations and training land, the fiscal year (FY) 2003 National Defense Authorization Act authorized the Military Services (Army, Navy, Marine Corps, and Air Force) to enter into agreements with eligible entities, such as conservation organizations, local governments, non-governmental organizations, and willing land owners to acquire real estate or conservation easements (from willing sellers only) in the vicinity of, or ecologically related to, a military installation or military airspace. This program serves as a dual benefit program: to protect military readiness by preventing incompatible development along borders between military installations and their neighbors and to protect sensitive environmental natural resources.

4.3 State of Maryland Plans and Programs

Chesapeake Bay Critical Area

The Critical Area Commission for the Chesapeake and Atlantic Coastal Bays was created as the Chesapeake Bay Critical Area Commission within the Department of Natural Resources in 1984 (Chapter 794, Acts of 1984). Initially, the Commission's charge was to adopt necessary criteria and regulations to minimize the adverse effects of human activity on the Chesapeake Bay ecosystem and guide future development. For the Chesapeake Bay Critical Area, these criteria and regulations were completed in 1985. From 1985 to 1990, the Commission reviewed and approved local critical area plans for those jurisdictions required by law to have such a plan. The Critical Area helps to protect NAS PAX from certain developments which may encroach on military influence areas.

The Critical Area Program is a land use and resource protection program established by law to improve water quality and protect wildlife habitat in Maryland's tidal shoreline areas. The program operates through local county and municipal plans and ordinances. The law requires every Maryland

jurisdiction with land in the Critical Area, to implement a Critical Area program through local ordinances, codes, plans, and policies. The law identified the Critical Area as all land within 1,000 feet of the Mean High Water Line of tidal waters or the landward edge of tidal wetlands and all waters of and lands under the Chesapeake Bay and its tributaries.

Maryland Coastal Zone Management Program

In response to the federal CZMA, the Maryland Coastal Zone Management Program (Chesapeake & Coastal Program) was formally created in 1978 representing a unique partnership between the state and the federal government and playing a dynamic role in shaping environmental policy in the state.

The CZMA provides Maryland with the means to administer its Coastal Zone Management Program and the opportunity to work with partners at the local level to develop programs, plans and strategies to address specific coastal issues. Maryland is awarded funds based on the size of its coastal population and the length of its tidal shoreline. Maryland currently receives about \$2.5 million annually from the NOAA Office of Ocean and Coastal Resource Management.

The Maryland coastal zone extends from three miles out in the Atlantic Ocean to the inland boundaries of the 16 counties and City of Baltimore that border the Atlantic Ocean, Chesapeake Bay and the Potomac River up to the District of Columbia. This area encompasses two-thirds of the state's land area and is home to almost 70 percent of Maryland's residents. All of the Maryland counties involved in the NAS PAX JLUS are located within Maryland's designated coastal zone.

Maryland Military Installation Council

The Maryland Military Installation Council (MMIC) originated as the Maryland Military Installation Strategic Planning Council established in August 2003 (Chapter 335, Acts of 2003). Effective June 1, 2006, the Council was restructured as the Maryland Military Installation Council (Chapter 634, Acts of 2006). MMIC serves as a forum for local community, military installation, business, state agency, and elected official dialogue on issues associated with

Maryland's military installations. MMIC is a division of the Maryland Department of Business and Economic Development. MMIC works to identify what public infrastructure and community support is needed for the development and expansion of Maryland's military installations and what the potential impact of that development and expansion will be on local communities. MMIC also researches how other jurisdictions cope with increased development around military installations and reviews state policies in order to best support the mission of the military installations and maximize economic benefits to local communities.

1997 Priority Funding Areas Act

The 1997 Priority Funding Areas Act directs state funding for growth related infrastructure to Priority Funding Areas (PFAs), providing a geographic focus for state investment in growth. PFAs are existing communities and places where local governments request state funding for future growth. Growth-related projects include most state programs that encourage growth and development such as highways, sewer and water construction, economic development assistance, and state leases or construction of new office facilities. This act legislatively designated certain areas as PFAs and established criteria for locally designated PFAs. The criteria include permitted density, water and sewer availability and designation as a growth area in the jurisdiction's comprehensive plan. The Priority Funding Area Act is codified in §5-7B of the State Finance and Procurement Article of the Annotated Code of Maryland.

PFA location within the JLUS Study Area, including the Lexington Park PFA, can potentially cause development of incompatible uses and encroachment on military influence areas.

4.4 Maryland County and Municipal Plans and Programs

Comprehensive Plans and Zoning Ordinances

In Maryland, authority to regulate land use is delegated by the state to counties and municipalities. The counties and municipalities are not always required to exercise these authorities, but if these powers are exercised, they must be exercised in accordance with specific provisions of state law.

Comprehensive plans capture how people want their communities to function and grow. In Maryland, local jurisdictions are required to review and, if necessary, update their comprehensive plans every ten years. The Maryland Department of Planning offers technical assistance for these updates. The Land Use Article of the Annotated Code of Maryland outlines different elements that the comprehensive plan must address and gives the planning commission the authority to include additional elements not required by Land Use Article.

The most fundamental implementation tool is zoning. A zoning ordinance establishes regulations for the use of land and some standards for development within identified zoning district boundaries. A related zoning map identifies properties that fall within different zoning categories. Zoning regulations must be uniform for each class or kind of development throughout each district, but regulations usually differ between districts.

These distinctions may have relevance to the particular scope of the delegated authority, to procedural requirements affecting land use planning and regulation or to other such matters. In addition to their comprehensive plans and zoning ordinances, counties and municipalities may also elect to use other tools to address specific compatibility issues. For example, Maryland state regulations require a general notification of potential noise from military installations, but local jurisdictions may further specify that this notification be accomplished through the land development process or real estate transfer. They may also require specific noise abatement techniques for construction in defined areas (such as a zoning overlay district) with measurable and clearly identified noise impacts.

Subdivision regulations provides cities (and sometimes) counties with authority to regulate the subdivision of land within incorporated areas, including managing roads, streets, drainage, and rights-of-way.

St. Mary's County Zoning, AICUZ Overlay District

Section 43.4.1 of the St. Mary's County Zoning Ordinance requires that development proposals within the AICUZ Overlay Zone provide evidence of filing of a Notice of Proposed Construction or Alteration with the FAA for all subdivisions and site plans; Section 43.4.2.a states that it is required only for buildings exceeding 100 feet in height. The applicant is required to forward copies of the FAA application with the Department of the Navy Commander at NAS PAX. The AICUZ Overlay Zone also addresses noise levels by requiring new construction to adhere to soundproofing standards, but application of the requirements depends upon adoption of noise contour lines on the county zoning map, which has not occurred yet. The AICUZ Overlay Zone additionally addresses the generation of dust, smoke and steam in the vicinity of NAS PAX Main Station through a performance standard that prohibits generation of these and other airborne materials in quantities that would impair visibility in the vicinity of the airport or otherwise interfere with aircraft operations. Furthermore, the AICUZ Overlay Zone prohibits developments that would create difficulty for pilots to distinguish between airport lights and other lights or which would cause glare in the eyes of pilots using the airport or airport facilities.

4.5 Commonwealth of Virginia Plans and Programs

Virginia Coastal Zone Management Act

Westmoreland and Northumberland counties are within Virginia's designated coastal zone. Virginia has developed and implemented a federally-approved coastal resources management program describing current coastal legislation and enforceable policies. The Virginia Coastal Resources Management Program has nine enforceable policies: fisheries management, subaqueous lands management, wetlands management, dune management, non-point source pollution control, point source pollution control, shoreline sanitation, air pollution control, and coastal lands management. Federal consistency

determinations in Virginia are reviewed by the Virginia Department of Environmental Quality, which coordinates reviews with other state agencies as well as county and regional planning agencies. Policies which dictate use of the Virginia Coast are important to NAS PAX because such a large part of NAS PAX activities take place near coastal areas.

Virginia Military Advisory Council

The Virginia Military Advisory Council is a statutorily constituted body (Virginia Code § 2.2-2666.1) comprised of military representatives from installations in the Commonwealth of Virginia as well as several elected and appointed officials. The Virginia Military Advisory Council was formed by the executive branch of the state government to maintain a cooperative and constructive relationship between the Commonwealth and the leadership of the several Armed Forces installations within the Commonwealth, and to encourage regular communication on continued military facility viability, the exploration of privatization opportunities and issues affecting preparedness, public safety, and security.

4.6 Virginia County and Municipal Plans and Programs

Comprehensive Plans and Zoning Ordinances

Virginia law mandates that every local government in Virginia prepare and adopt a comprehensive plan (§ 15.2-2223). The comprehensive plan is the foundation for all decision-making in matters involving land use planning and growth management. The comprehensive plan is considered advisory and serves as a guide for the physical development of the territory within specific jurisdictional boundaries. Although the comprehensive plan itself does not directly regulate land use, the plan does have status as a fundamental instrument of land use control once it is adopted by the local governing body.

Each local government in Virginia is required to adopt a subdivision ordinance to assure that land development occurs in an orderly and safe manner. Zoning Standards authorizing the use of zoning in Virginia are found in § 15.2 2280 of the state code. The purposes of zoning are spelled out in § 15.2 2283 of the code, while matters that a locality shall consider when developing a zoning

ordinance and when applying or using the zoning ordinance are outlined in § 15.2 2284. Zoning is considered the quintessential tool of comprehensive plan implementation. Zoning divides a locality into specific districts and establishes regulations concerning the use, placement, spacing, and size of land and buildings within the respective districts. Zoning is intended to avoid disruptive land use patterns by preventing activities on one property from generating external effects that are detrimental to other properties.

Building Codes

The Virginia USBC contains the building regulations that must be complied with when constructing a new building or structure or when adding an addition to an existing building. It must also be used when maintaining or repairing an existing building or renovating or changing the use of a building or structure. The provisions of the Virginia USBC are based on nationally recognized model building and fire codes published by the International Code Council, Inc. The model codes are made part of the Virginia USBC through a regulatory process known as incorporation by reference. The Virginia USBC also contains administrative provisions governing the use of the model codes and establishing requirements for the enforcement of the code by the local building departments and other code enforcement agencies. The USBC is divided into three stand-alone pieces: the Virginia Construction Code, Virginia Rehabilitation Code, and Virginia Maintenance Code. Provisions contained within the Virginia USBC that may be useful in compatibility planning include R327.2 Airport noise attenuation and 1207.4 Airport noise attenuation standards.

4.7 Regional Planning Entities

There are a number of regional entities engaged in various advocacy, scientific, educational, and organizational activities throughout the Study Area. The relevant regional entities include the Tri-County Council of Southern Maryland, the Mid Shore Regional Council, the Northern Neck Planning District Commission and the Tri-County Council for the Lower Eastern Shore.

Please see the next page.



5.1 Identification of Compatibility Issues

Compatibility, in relation to military readiness, is defined as the balance or compromise between community and military needs and interests. The goal of compatibility planning is to promote an environment where both entities communicate, coordinate, and implement mutually supportive actions that allow them to achieve their respective goals and objectives.

Numerous factors influence whether community and military plans, programs, and activities are compatible or in conflict. For the Naval Air Station Patuxent River Complex (NAS PAX) JLUS, 24 compatibility factors were used to confirm the presence of, and establish priorities for, the key Study Area issues. These compatibility factors are grouped into three broad categories: man-made factors, natural resource factors, and competition for scarce resources.

Man-Made Factors	Natural Resource Factors
1 Interagency Coordination / Communication	9 Vibration
2 Land Use	10 Dust / Smoke / Steam
3 Safety Zones	11 Light and Glare
4 Vertical Obstruction	12 Energy Development
5 Local Housing Availability	13 Air Quality
6 Infrastructure Extensions	14 Frequency Spectrum Impedance / Interference
7 Anti-Terrorism / Force Protection	15 Public Trespassing
8 Noise	16 Cultural Sites
	17 Legislative Initiatives
	18 Water Quality / Quantity
	19 Sensitive Biological Resources
	20 Marine Environments
	Competition for Scarce Resources
	21 Scarce Natural Resources
	22 Land, Air, and Sea Spaces
	23 Frequency Spectrum Capacity
	24 Roadway Capacity

Several of these factors were grouped together due to similar issues and strategies including Noise combined with Vibration, and Frequency Spectrum Impedance/Interference was combined with Frequency Spectrum Capacity.

Of the 24 compatibility factors considered, several of which were determined to be inapplicable to this JLUS: Local Housing Availability, Infrastructure Extensions, Dust / Smoke / Steam, Air Quality, Public Trespassing, Cultural Resources, Marine Environments, and Scarce Natural Resources. The remaining factors are:

- Anti-Terrorism / Force Protection (ATFP)
- Biological Resources (BIO)
- Energy Development (ED)
- Frequency Spectrum (FS)
- Interagency Communication / Coordination (COM)
- Land, Air, and Sea Space Competition (LAS)
- Land Use (LU)
- Legislative Initiatives (LEG)
- Light and Glare (LG)
- Noise (and Vibration) (NO)
- Roadway Capacity (RC)
- Safety Zones (SAF)
- Vertical Obstruction (VO)
- Water Quality / Quantity (WQQ)

Issues

At the initial committee workshops and subsequent public forums, groups were asked to identify the location and type of compatibility issues they thought existed today, or could occur in the future, using the 24 factors as a guide. A number of individual issues were identified for each factor.

Additional technical issues were analyzed and added based on available information and similarity with other community JLUS experiences around the country.

Setting Priorities

The public and committees provided input on establishing priorities for the compatibility factors and issues. Priorities were used to determine the type and timing of associated actions for each issue. Three criteria were utilized to prioritize the compatibility factors:

- **Is it a Current Impact?** Each issue was considered based on its current impact to the compatibility of either NAS PAX or the surrounding areas. Issues posing the most extensive operational constraints or community concerns constitute the highest priority.
- **Location.** This criterion assesses the proximity of each issue in relation to activities occurring on NAS PAX and its ranges and surrounding areas. Issues occurring near the installation are often more critical than those occurring remotely.
- **Potential Impact.** Although an issue may not present a current threat to the installation or the community, it may possess the ability to become an issue in the future. Should conditions change, adjacent or proximate development increase, or other issues become apparent, new conflicts with existing or future missions and operational activities at NAS PAX could arise. Issues were considered based on their future potential using the same criteria that were established for current impact.

With a comprehensive list of issues to address in the JLUS, the public and TAG identified the relative priority of each compatibility factor. The PC finalized the prioritization of issues based on public and TAG input, dividing the factors into four categories:

- **High-Priority.** Due to the nature of these issues, an immediate response is warranted. Issues identified as High Priority are to be initiated during the next 1-2 years beginning in 2015.

- **Medium-Priority.** To be initiated in 3-5 years after completion of the JLUS (initiate by 2017).
- **Awareness Factors.** Awareness factors are those issues that pose a minor threat to NAS PAX and/or the surrounding jurisdictions and are documented in this JLUS for the purpose of maintaining operational awareness. These items do not require action at the current time, but should be monitored in the long term.
- **Ongoing Factors.** Ongoing factors are those issues that require continuous monitoring to ensure the implementation of the strategies are maintained throughout the implementation phase and in the future.

5.2 NAS PAX Compatibility Issues by Factor

Anti-Terrorism / Force Protection is the protection and security of the nation's defense assets. Issues are created when national defenses can be breached or compromised, such as development close to the fence line where the public can view operational activities. It is important for the DOD and NAS PAX to address these issues to ensure military readiness. The following Anti-Terrorism / Force Protection issues were identified:

- **Leased Space Off-Base.** NAS PAX leases and occupies office space off-installation that does not meet security requirements. Proper AT/FP requirements are not met at these sites that are located within the community.
- **Waterfront Access to NAS PAX.** NAS PAX main station is accessible via the Chesapeake Bay and Patuxent River. High levels of waterway traffic create security concerns when boaters approach NAS PAX shorelines.

Biological Resources are resources that include federal and state listed species (threatened and endangered species) and the habitats they exist in or utilize. These resources may also include areas such as wetlands and migratory corridors that are critical to the overall ecosystem. The presence of sensitive biological resources may require special development considerations and

should be included early in the planning process. The following Biological Resources issue was identified:

- **Wildlife Refuges in Region.** Nesting birds and other wildlife species could be impacted by military exercises. This is exacerbated during breeding and migrating times, working against investments that have been made to protect threatened species.

Energy Development of energy sources, including alternative energy sources (such as solar, wind, geothermal or biofuels) could pose compatibility issues related to glare (solar energy), or vertical obstruction (wind generation), or water quality / quantity. The following Energy Development issues were identified:

- **Solar Panels near Flight Paths.** The use of solar panels can adversely affect military operations if not properly sited.
- **Wind Energy Development.** There is a need for a formal and coordinated site selection process and standard criteria for potential wind energy development. Interest in the use of wind turbines on agricultural lands as an opportunity for increasing profitability has grown; however, such uses would interfere with military operations and instrumentation viewsheds.

Frequency Spectrum is the entire range and capacity of electromagnetic frequencies used for communications and other transmissions, which includes communication channels used for radio, cellular phones, and television. In the performance of typical operations, the military relies on a range of frequencies with reliable capacities for communications and support systems. Similarly, public and private users rely on a range of frequencies in the use of cellular telephones and other wireless devices used on a daily basis. The following Frequency Spectrum issues were identified:

- **Disruption to Communications Equipment.** Frequency interference is a great concern around airfields where the loss of communication has

caused both the crash of military systems and aviation equipment critical to uninterrupted communication and safe use of systems.

- **Disruption to Emergency Service Communications Equipment.** Local emergency responders experience interruptions in radio frequency. Radio devices used in emergency response have unexpectedly turned off or failed because of frequency problems.
- **Widespread use of Wireless Devices.** Frequency interference issues have increased as wireless demands and technology use skyrockets. Residents can and have experienced inoperable garage and car doors as well as other systems sharing frequency bands.
- **Vertical Elements.** Tall structures that are at currently unregulated heights (less than 199 feet) can result in vertical obstructions, which in turn cause frequency issues and electromagnetic interference.
- **Competition for Frequency Spectrum.** The existing frequency spectrum allotted by the Federal Communications Commission (FCC) for military use is under pressure and suffering encroachment from consumer electronics manufactured to use the Navy's spectrum.

Interagency Coordination / Communication is the communication and collaboration between multiple agencies engaged in a common goal. For the NAS PAX JLUS, interagency coordination represents several challenges for both NAS PAX and surrounding communities. The lack of a coordinated approach when planning activities including proposed development and infrastructure extensions can result in incompatibilities for sustaining the NAS PAX mission and growth of the surrounding communities. The lack of information sharing such as important geographic information system data used for planning and mapping can potentially result in incompatible development near the installation and ranges. The following Interagency Communication / Coordination issues were identified:

- **Minimal Communication amongst Agencies and Public about Military Operations.** Local agencies and the public feel that efforts to communicate and coordinate with the Navy are dismissed or

discouraged when addressing issues or concerns related to military installations and operations.

- **Community Awareness of Military Operations Varies Across Region.** Communities located furthest from PAX are often unaware of planned exercises and military operations. As a result, residents may call their local government contacts with concerns, often resulting in inaccurate responses due to a lack of awareness of planned PAX activities and little communication between PAX and communities in the region.
- **Local Point of Contact at PAX.** Both residents and local leaders do not know who to contact at PAX when questions or concerns arise.
- **Coordination of Civilian / Military Airspace Interference.** Civilian airports used by PAX do not have a Letter of Agreement that addresses all possible military users and activities at the airport.
- **Regional Coordination Does Not Address All Four Sub Areas.** Although there are four regional planning organizations (Mid Shore Regional Council, Northern Neck Planning District, Tri-County Council for the Lower Eastern Shore and Tri-County Council for Southern Maryland), there is no effort to address common issues from a broader perspective.
- **No Method for Navy Input into Development Review Process.** NAS PAX has no formal development coordination with each jurisdiction affected by military operations. Oftentimes military officials are unaware of upcoming developments and rely on monitoring newspapers and periodicals for potential conflicts. Both the military and the public are typically unaware of potential conflicts prior to advancing development initiatives.
- **Public Uninformed about Unmanned Aerial Systems (UASs).** The general public does not understand military and civilian use of Unmanned Aerial Systems (UASs). The lack of information about the use and intent of UASs' has resulted in concern and decreased support by the public for these aircraft.

Land, Air and Sea Space Competition is defined as multiple uses of land, air, and sea spaces. The NAS PAX JLUS evaluated land, air, and sea space shared between military and civilian activities relative to commercial / civilian—general aviation and maritime operations in the region. The NAS PAX JLUS also assessed several areas used for recreational purposes. The following Competition for Land and Air Spaces issues were identified:

- **Recreational Boaters and Fisherman in Range Area.** There is competition for use of the water among recreational boaters and fishermen. Sea spaces need to be cleared near Webster Field and near the marine targets when active training and operations are occurring.

Land Use is the impetus for the NAS PAX JLUS. The JLUS assesses various components of land use to determine compatibility between unique military missions and the economic vision of the surrounding jurisdictions. This assessment considers accomplishing mutual goals and benefits to facilitate the military's continued training mission for readiness while allowing for economic development in adjacent communities. Certain land uses are sensitive to noise, vibration, and other impacts generated by military training exercises. In contrast, certain land uses employed by communities can limit military training activities by encouraging annexation practices in areas critical to the military mission. The following Land Use issue was identified:

- **Military Compatibility Policy within the Comprehensive Plans.** Compatibility with NAS PAX is not addressed in comprehensive plans, zoning codes, or other development ordinances throughout the region.

Legislative Initiatives are issues that require legislative action or amendments to ensure compatibility factors are addressed within local jurisdictions that affect or are affected by proximity to NAS PAX. The following Legislative Initiatives issue was identified:

- **Repurposing of 500 MHz of Spectrum.** A 2010 Presidential directive to repurpose spectrum for private industry use could impair military mission sustainment.

- **Shared Use of Civilian Airports.** The lack of formal agreements for military use of regional airports could result in reduced capacity for the Navy's use of these airfields.
- **Renewable Energy Mandates.** Maryland's goal of attaining 20 percent of its energy needs from renewable sources and the related promotion of wind powered turbines has the potential to create a variety of substantive conflicts.

Light and Glare can be generated by both military and civilian uses. Light and glare can be generated from certain construction materials during the daytime when sunlight reflects off the structure. This can create visual impairments for pilots flying at low altitudes. Certain types of alternative energy development can create glare for pilots in training, posing a safety hazard to the pilot and the aircraft. The following Light and Glare issue was identified:

- **Light and Glare from Community Development.** Lighting controls and standards are not codified by all jurisdictions in the region. Existing standards do not address compatibility with night operations that require Dark Sky conditions.

Noise (and Vibration) are the result of both military training exercises and construction and development activities. These factors can be incompatible with sensitive land uses. Noise that is loud and extending into night hours can disrupt the lives of the public. Vibration can disrupt daily living activities and in extreme cases cause structural damage. The JLUS strives to balance community quality of life with mission operations and readiness. The following Noise and Vibration issues were identified:

- **Lack of Community Noise Regulations Surrounding Airfields.** Standards to address noise impacts from military operations near airfields do not exist in most jurisdictions. The standards that do exist require an update to noise standards in accordance with current noise level contour maps.
- **Lack of Community Noise Regulations over Range Areas.** Standards to address noise impacts from military operations within range areas do

not exist in most jurisdictions. The standards that do exist require an update to noise standards in accordance with current noise level contour maps.

- **Noise from Jet Holding Pattern.** The jet holding pattern creates excessive levels of noise in areas where sensitive uses are located.
- **Occasional Sonic Boom from Jets Flying Overhead.** Sonic booms are problematic over shoreline communities. There are regular complaints called in to the NAS PAX hotline regarding sonic booms or noise from aircraft passing overhead. The Navy mitigates most noise complaints through awareness notification and testing in ways to minimize complaints; however, increased noise complaints could compromise operations through pressure to modify or discontinue specific operations.
- **Noise and Vibration from Engines.** Engine testing operations and low level flight cause noticeable vibrations and result in community complaints of sleep disturbance and property damage
- **Sensitive Land Uses in Webster Field Noise Contours.** Sensitive land uses (residential and places of worship) exist within areas that experience noise greater than 60 dB DNL. The AICUZ Overlay does not apply to areas around Webster Field, thus development around Webster Field does not require consideration for noise levels.
- **Noise Associated with Military Aircraft at Regional Airports.** Occasional inquiries concerning noise from military aircraft at regional airports are received from residents and occupants of sensitive land uses such as schools and churches. Regional airport representatives are not always aware of planned military activity in the area and often unable to reach a Navy contact who can respond to noise complaints
- **Residential Development Pressures in Areas within Noise Contours.** Increased noise levels up to 70 dB are experienced in the southern tip of Calvert County where Drum Point and the Chesapeake Ranch Estates (single-family residential), which are the most densely populated areas of Calvert County, are located and continue to develop.

Roadway Capacity can create incompatibilities between military operations and civilian activities due to limited roadway capacity. Roadway Capacity was evaluated for coordination of improved public roadways to meet the needs of both military and civilian uses. The following Roadway Capacity issues were identified:

- **Base Ingress / Egress.** Route 235/Three Notch Road is at capacity due to high volumes approaching NAS PAX main station entry points. Additional development on- and off-base will likely lead to roadways and intersections with failing level of service.
- **Safety / Emergency Access Routes.** Congestion on Route 2/4 affects traffic traveling from Calvert County into St. Mary's County in the AM and from St. Mary's County to Calvert County in the PM. The Thomas Johnson Bridge is a vital link between the two counties, is critical to NAS PAX accessibility, and is part of an emergency access/egress route.

Safety Zone issues are generated by both military and civilian land uses. Safety concerns relevant to military operations include development (i.e. even the stacking of hay bales and other such commodities) near or adjacent to the runway in areas where development is strongly discouraged such as the Clear Zone. Safety issues are also evaluated based on the land uses located near active runways, such as water features, that can attract birds and wildlife to this critical aviation area where low-speed low-altitude aircraft perform operations. The following Safety issues were identified:

- **Military Operations over Recreational Waterways Used by Recreational Boaters.** Watermen and recreational boaters often do not understand or are unaware of safety requirements or Navy activities that would affect public waterways. Clearing of the waterways to maintain safe clearance distances can cause delays in scheduled activities and testing.
- **Bird Attractants near Runway.** Runway (14/32) extends from the Patuxent River to the shore of the Chesapeake Bay. Numerous bird attractants such as fishing and clamming nets are located near the piers in the bay. Bird activity in close proximity to the runway is an aviation safety hazard and increases the potential for bird aircraft strikes.

- **Webster Field Clear Zones Extend Off Base (West).** The Clear Zone associated with the runways at Webster Field extend off base to lands not owned by the Navy that are both currently developed and zoned for additional growth. Within St. Mary's Zoning Ordinance, land development tools do not address land use compatibility around Webster Field.
- **No Defined Accident Potential Zones Associated with Webster Field Clear Zones (West).** Due to the low number of fixed-wing operations at Webster Field, Accident Potential Zones (APZs) are not imposed beyond Webster Field's Clear Zones. Based on the Clear Zones extending off base, the APZs would also extend into the community where development of uses that are incompatible in safety zones is currently permitted.
- **Development within NAS PAX Main Station Safety Zones (West).** Although no new residential development is permitted in the CZs or APZs associated with NAS PAX Main Station, residential uses are currently located in the safety zones. Residential areas are located to the southeast of the base in the Lexington Park, Southampton, Southgate Park, Cedar Cove, and Forest Park neighborhoods within or adjacent to APZ I and APZ II.

Vertical Obstructions are structures that impede navigable airspace for both military and civilian aircraft operations. Structures that pose a threat to the airspace for military and civilian aviation include tall wind turbines and wireless communication towers. It is important to ensure the communities adjacent to NAS PAX plan accordingly to safeguard against unintended safety concerns relative to structures that obstruct navigable airspace. The following Vertical Obstructions issues were identified:

- **Interference with Low Level Flight Activity.** Future development of wind turbines and cell towers are likely to create vertical obstruction issues, particularly for UASs and low level aircraft.
- **Airfield Protection.** Tall structures in proximity to the airfield have the potential to interfere with the safe operation of the airfield.

Water Quality and Quantity is the factor that assesses the quantity and quality of water resources in the NAS PAX JLUS Study Area. This factor evaluates the amount of water that is utilized by the installation relative to the available supply of water and then compares that with the demand and supply that is utilized by the surrounding communities to provide for the necessary public services. In addition to evaluating the water supply, this factor also reviews the overall quality of public water use in the JLUS Study Area. Water quality can be affected by military operations, public recreation use and stormwater drainage. The following Water Quality and Quantity issue has been identified:

- **Salt Water Intrusion.** Water quality / quantity concerns include the assurance that adequate water supplies of good quality are available for use by the installation and surrounding communities as the area develops. Water supply for agriculture and industrial use is also considered.

Please see the next page.



6.1 Implementation Plan

This section identifies and organizes the recommended actions (strategies) developed through a collaborative effort between representatives of local jurisdictions, NAS Patuxent River Complex (NAS PAX), state and federal agencies, local organizations, the general public and other stakeholders that own or manage land or resources in the region. Because the NAS PAX JLUS is the result of a collaborative planning process, the recommendations in this section represent a true consensus plan; a realistic and coordinated approach to compatibility planning developed with the support of stakeholders involved throughout the process.

JLUS strategies incorporate a variety of actions that can be implemented to promote compatible land use and resource planning. Upon implementation, existing and potential compatibility issues arising from the civilian / military interface can be removed or significantly mitigated. As such, the recommended strategies function as the heart of the JLUS document and are the culmination of the planning process.

The key to the implementation of the strategies is the establishment of the JLUS Implementation Task Force to oversee the JLUS execution. Through this Task Force, local jurisdictions, NAS PAX, and other interested parties can continue their initial work together to establish procedures, recommend or refine specific actions for member agencies, and make adjustments to strategies over time to ensure the JLUS continues to resolve key compatibility issues through realistic strategies and implementation.

6.2 Implementation Plan Guidelines

The key to a successful plan is balancing the different needs of all involved stakeholders. Several guidelines formed the basis upon which the strategies were developed:

- In concert with the Maryland and Virginia state laws, the Implementation Plan was developed with the understanding that the recommended strategies must not result in a taking of property value. In some cases, the recommended strategies can only be implemented with new enabling legislation.
- In order to minimize regulation, where appropriate, strategies were recommended only for specific geographic areas to resolve the compatibility issue.
- Similar to other planning processes that include numerous stakeholders, the challenge is to create a solution or strategy that meets the needs of all parties. In lieu of eliminating strategies that do not have 100 percent buy-in from all stakeholders, it was determined that the solution / strategy may result in the creation of multiple strategies that address the same issue but tailored to individual circumstances.

6.3 NAS PAX Military Compatibility Area Overlay District (MCAOD)

In compatibility planning, the term “Military Compatibility Area” (MCA) is used to formally designate a geographic area where military operations may impact local communities, and conversely, where local activities may affect the military’s ability to conduct its mission. The MCAs are geographic areas where specific types of recommended JLUS strategies apply.

An MCA is designated to accomplish the following:

- Promote an orderly transition between community and military land uses so that land uses remain compatible.
- Protect public health, safety, and welfare.
- Maintain operational capabilities of military installations and areas.
- Promote an awareness of the size and scope of military training areas to protect areas separate from the actual military installation (i.e., critical air space) used for training purposes.
- Establish compatibility requirements within the designated area, such as requirements for sound attenuation and aviation easements.

An MCA delineates a geographic area where strategies are recommended to support compatibility planning and JLUS goal and objectives. To better reflect the area of interest and focus implementation, several MCAs are further divided into subareas.

The Military Compatibility Area Overlay District (MCAOD) is a zoning technique that ensures the JLUS strategies are applied to the appropriate areas, and that locations deemed not subject to a specific compatibility issue are not adversely impacted by regulations or policies inappropriate for their location or circumstance. The MCAODs encompass all the MCAs and its geographic boundary is defined by the largest MCA boundary. The MCAOD should be used by local jurisdictions to address ways to prevent or mitigate compatibility issues. Each jurisdiction’s MCAOD boundary is determined by

the largest geographic boundary of all the MCAs that fall within their jurisdiction.

For the purpose of this JLUS Implementation Plan, there is one MCAOD which includes MCAs for both NAS PAX and Webster Field as depicted in Figure 7.

The NAS PAX MCAOD has one MCA applicable to a major portion of the entire JLUS Study Area – the Energy Development MCA and four MCAs specific for each NAS PAX Main Station and Webster Field which include:

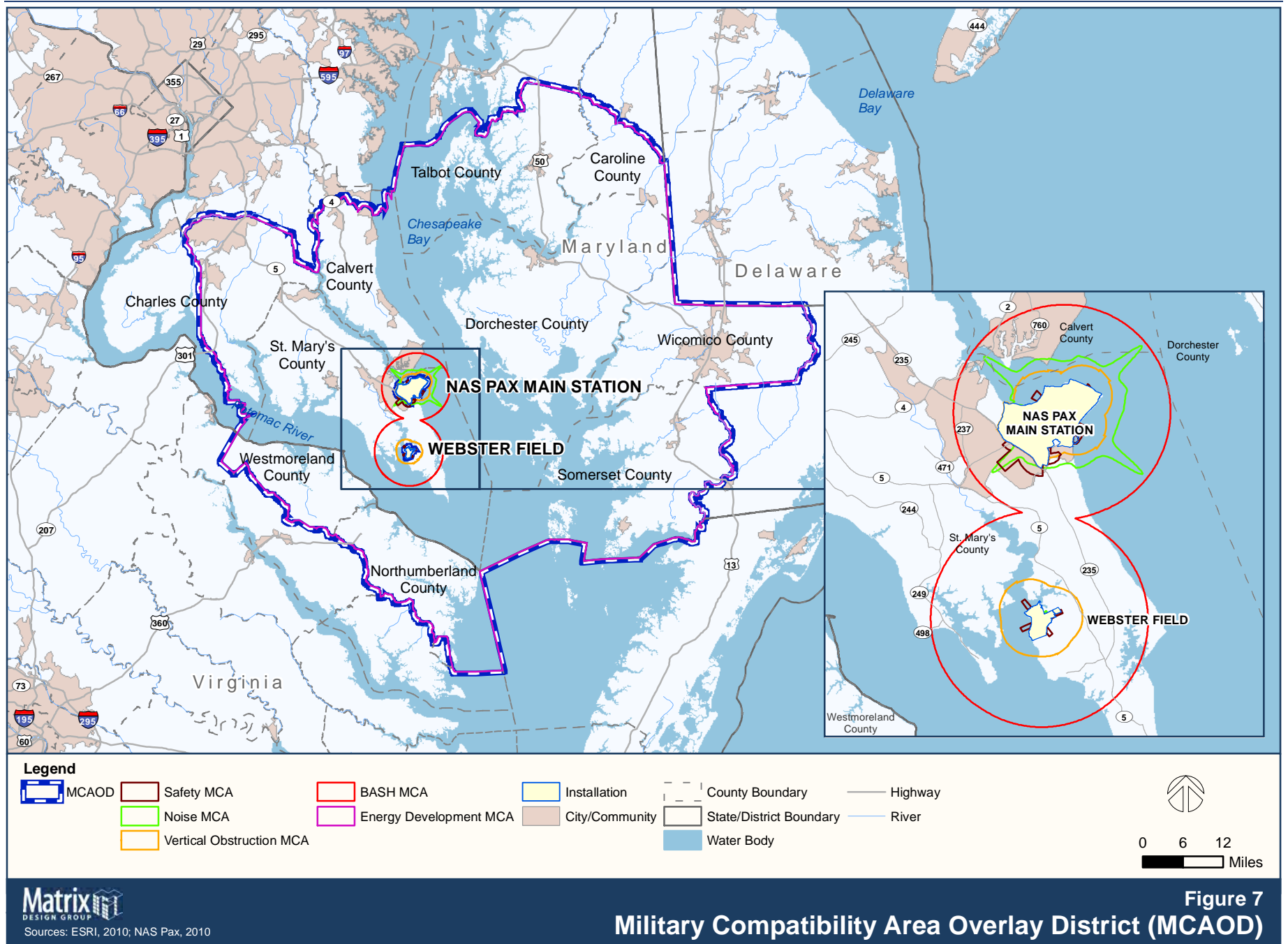
- Safety MCA
- Noise MCA
- Vertical Obstruction MCA
- BASH MCA

These MCAs are discussed in the following sections.

NAS Patuxent River Military Compatibility Areas

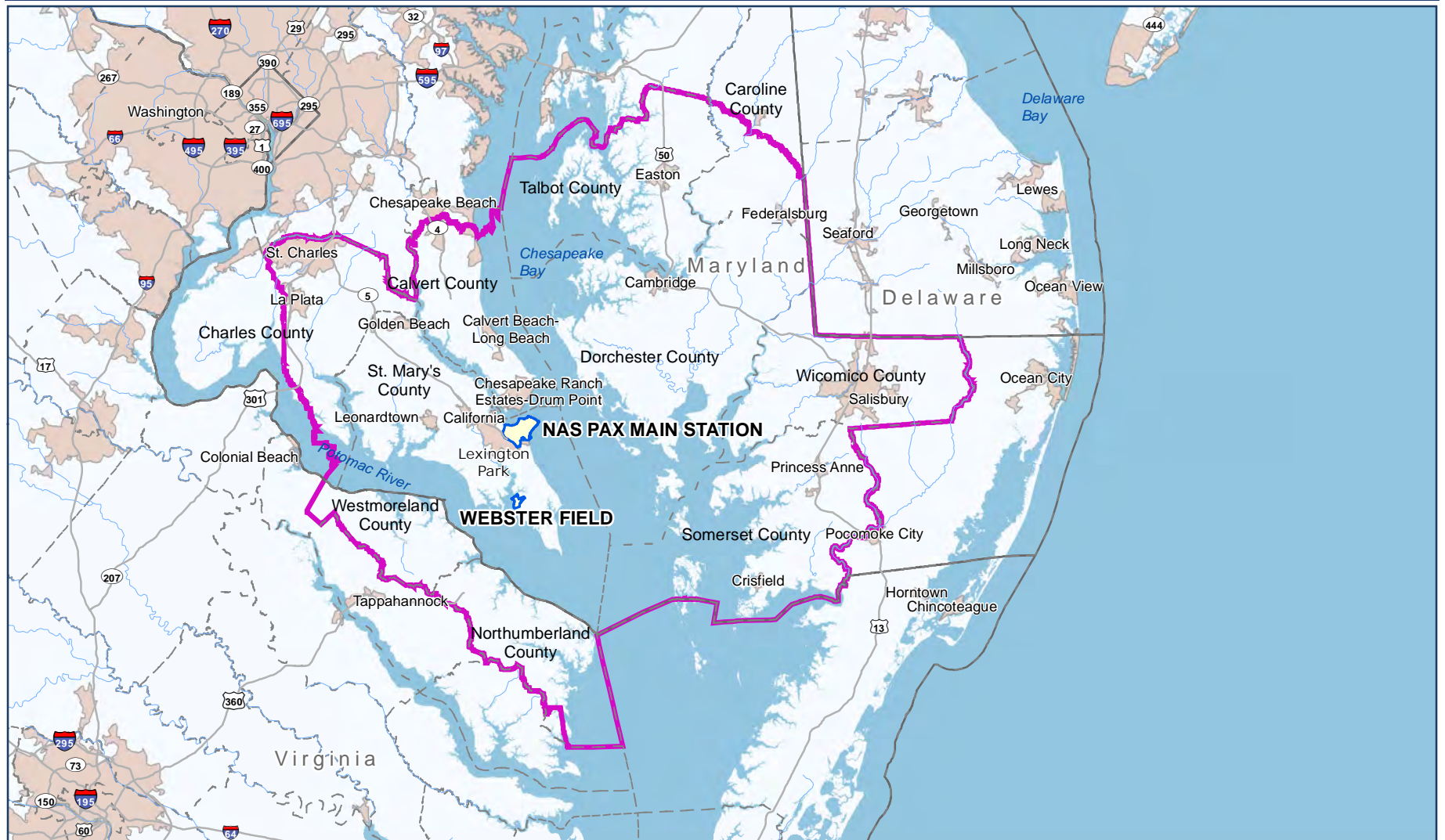
Energy Development MCA

The Energy Development MCA is an area characterized by existing, proposed, or potential areas for alternative wind energy development or other types of proposed structures that may have a height that penetrates into the NAS PAX Radar Viewshed area or the High Risk For Adverse Impact Zone that may cause vertical obstructions and / or frequency interference issues that could conflict with the military operations. This broad area, illustrated in Figure 8, covers St. Mary’s County, Calvert County, Caroline County, Charles County, Dorchester County, Wicomico County, and Somerset County in Maryland and Northumberland and Westmoreland Counties in Virginia. Wind energy development such as wind turbines and transmission towers in this area should be coordinated with NAS PAX.



NAS_PAX_Fig7_MCAOD_20150113_JKC.pdf

Naval Air Station Patuxent River Joint Land Use Study



Legend

- Energy Development MCA
- Installation
- County Boundary
- Highway
- City/Community
- State/District Boundary
- Water Body
- River



0 6 12
Miles



Sources: ESRI, 2010; NAS Pax, 2010

Figure 8
Energy Development Military Compatibility Area (MCA)

NAS_PAX_Fig8_EnergyDevelopmentMCA_20141211_CJM.pdf

The Energy Development MCA is characterized by wind energy development evaluation criteria such as height of structures and frequency spectrum interference. Therefore, recommendations for this area include case-by-case coordination with FAA, NAS PAX, and the DOD Clearinghouse regarding possible height restrictions and frequency interference.

NAS PAX Main Station Military Compatibility Areas (MCAs)

Safety MCA

The Safety MCA addresses areas that could be affected by low-speed and low-altitude aircraft associated with military training operations and comprises the airfield's Clear Zone (CZ), Accident Potential Zones I and II (APZ I and APZ II) as depicted in Figure 9. The airfield safety zones are characterized by a high risk for aircraft collisions due to location and types of aviation operations that occur based on statistical modeling of past aviation collisions.

The proposed Safety MCA identifies areas where measures would be applied to regulate compatible land use types and densities / intensities and provide additional development review coordination. The MCA contains three subzones: CZ, APZ I, and APZ II.

Each of the safety zones has recommended guidelines of the type of development that should not occur within them. These guidelines can be found in the DOD United Facilities Criteria (UFC) 3-260-01, under Land Use Compatibility Guidelines for Clear Zone and Accident Potential Zones. Within the CZ, most land uses are incompatible with aircraft operations. It is recommended that no development be located within CZs.

Compatibility guidelines preclude land uses that concentrate large numbers of people (such as but not limited to high density residences, apartments, churches, and schools) from being constructed within the APZs. While the likelihood of an accident is remote, the DOD recommends low density land uses within the APZs to ensure the maximum protection of public health and property.

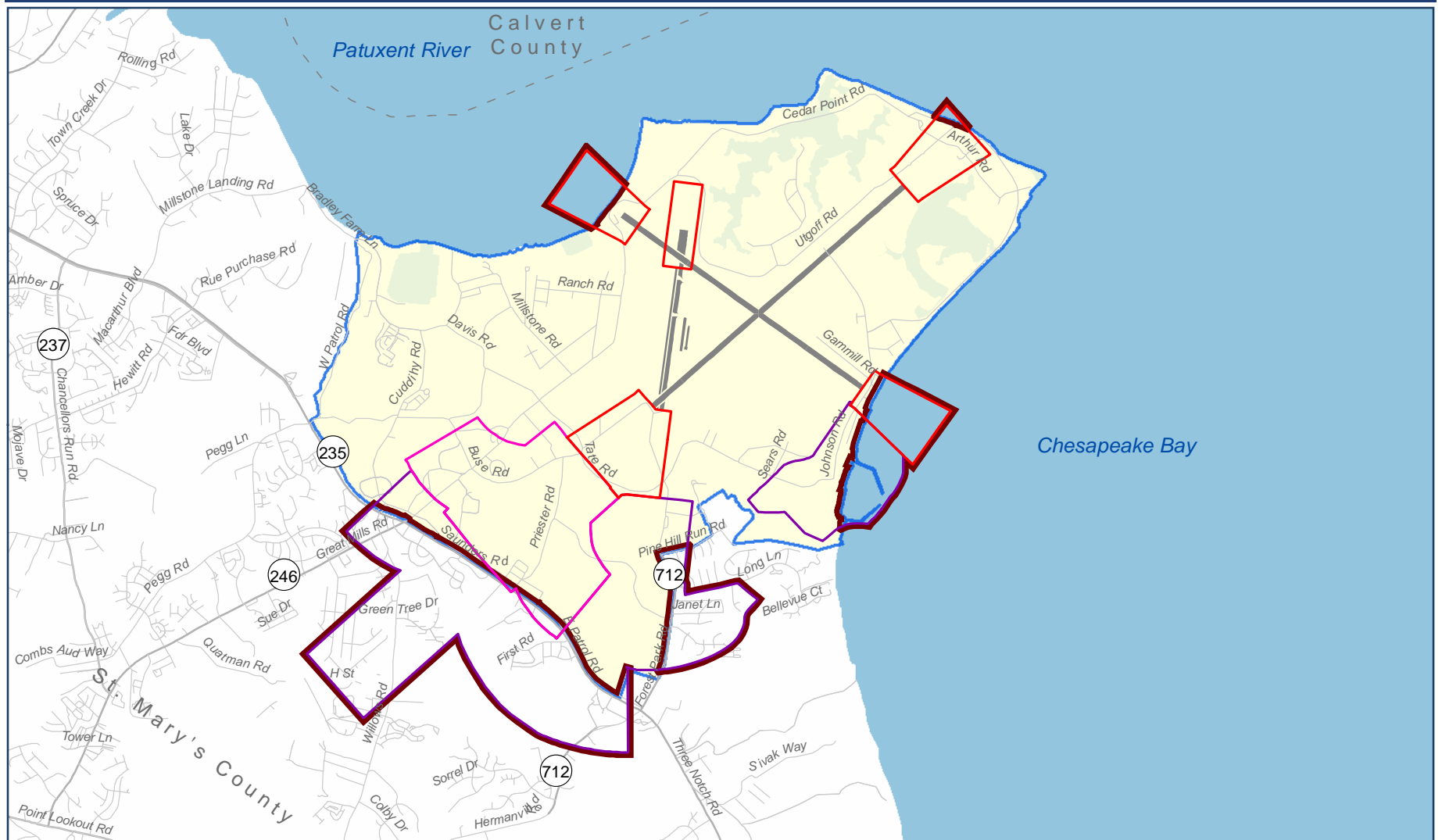
Strategies recommended for this area include updating zoning codes to address safety zones and requiring a special approval process that includes Navy review. Prescribed heights of proximate structures would need to be coordinated with NAS PAX.

Noise MCA

The Noise MCA includes all land located off-installation within noise contours greater than 65 decibels, A-weighted (DNL) noise levels associated with military activities. This MCA is depicted in Figure 10.

Noise is often a concern to the public surrounding military installations with a flight mission. Residential developments and other noise sensitive land uses within this MCA should be subject to sound attenuation measures to reduce interior noise levels to achieve a maximum interior noise level of 45 dB DNL to enhance the quality of life for the citizens within this area and to possibly eliminate noise complaints.

Naval Air Station Patuxent River Joint Land Use Study



Legend

- | | | | |
|------------|---------------------|-----------------|------------|
| Safety MCA | Safety Zones | Installation | Water Body |
| CZ | APZ-I | County Boundary | Runway |
| APZ-II | APZ-II | Highway | Road |



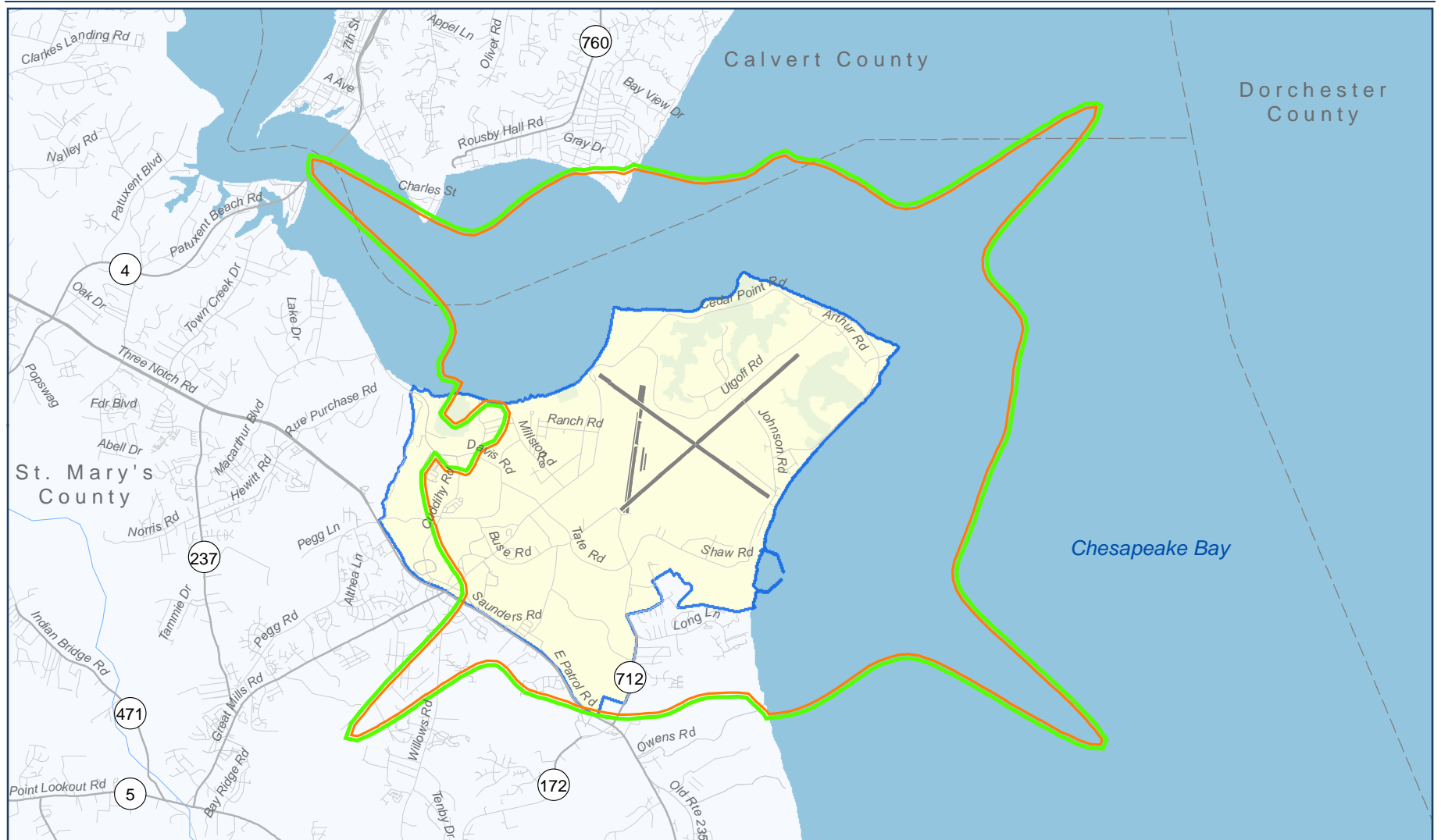
0 0.5 1
Mile



Sources: ESRI, 2010; NAS Pax, 2010

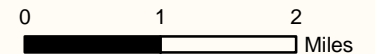
Figure 9
Main Station Safety Military Compatibility Area (MCA)

NAS_PAX_Fig9_MainStationSafetyMCA_20150113_JKC.pdf



Legend

- Noise MCA
- Installation
- Water Body
- County Boundary
- Runway
- Highway
- Road



Matrix
DESIGN GROUP
Sources: ESRI, 2010; NAS Pax, 2010

Figure 10
Main Station Noise Military Compatibility Area (MCA)

NAS_PAX_Fig10_MainStatNoiseMCA_20150113a_JKC.pdf

Without a requirement for sound attenuation via building code requirements, certain uses such as residential, uses that congregate large groups, schools, healthcare facilities, and outdoor parks and recreation are not compatible within areas that experience noise levels of 65 dB DNL or greater. Uses compatible within airport noise contours are office / retail and manufacturing / industrial when interior noise levels experienced are less than 70 dB DNL. The local building code should be used to require the implementation of noise-attenuation measures for all new development within the Noise MCA. Although this tool will not prevent incompatible development, building codes can maximize compatibility to the greatest extent practicable.

Additional information and technical background explaining the various noise measurement units (i.e., ADNL / CDNL vs. dB) and specific noise contours associated with both arms and aviation is provided in the JLUS Background Report.

Vertical Obstruction MCA

The Vertical Obstruction MCA is based on the DOD imaginary surfaces - Inner Horizontal Surface and Approach-Departure Clearance Surface for active runways and an additional one half nautical mile beyond these boundaries which restricts development of buildings and structures from 0 feet to 150 feet above mean sea level. The Vertical Obstruction MCA is intended to denote the importance of incorporating requirements that follow the DOD criteria with regard to structure height and is not intended to reduce or change guidance with regard to maximum height of structures.

A potential source for aircraft accidents to occur is related to the presence of vertical obstructions in areas that are frequently used by low flying aircraft. Examples of potential vertical obstructions include communications towers (radio, television, cellular, microwave, etc.), silos, electric transmission towers and lines, and similar manmade structures. While the presence of vertical obstructions can sometimes be mitigated by altering training routes, increasing minimum allowable flight altitudes or similar risk reduction measures, the proliferation of vertical obstructions or their placement along key flight routes can cause long term changes in the viability of military

airspace and training operation, ultimately affecting the sustainability of the military training mission.

The purpose of the Vertical Obstruction MCA is to regulate the height of all structures and buildings within the area defined by DOD instructions known as imaginary surfaces. The imaginary surfaces are a three dimensional geographic area comprising a series of surfaces that extend both vertically and horizontally from an airfield. Vertical obstruction issues are a major concern to flight operations and training due to the potential for a building or structure to extend into navigable airspace and impede the safety of flight operations. Vertical obstructions that can affect flight safety include, but are not limited to, cell towers, power lines, wind turbines, buildings, and trees.

The NAS PAX Main Station Vertical Obstruction MCA is illustrated on Figure 11.

BASH MCA

The NAS PAX Bird and Wildlife Strike Hazard (BASH) MCA extends out from Main Station primary surfaces (runways) a distance of five statute miles. This MCA is meant to include areas around the airfield with the highest safety concerns if concentrations of birds or bird-attractions uses were located there. Bird strikes with aircraft can have serious safety concerns, including the potential for loss of life and / or aircraft. Even minor bird strikes can cause costly repairs to aircraft and interfere with training missions.

The five-mile distance associated with the BASH MCA is an FAA recommended standard for managing bird attractants around runways. Developments like landfills, landfill transfer stations, developments with major water features are just some examples of uses that may attract birds within the approach and departure flight corridors in an around NAS PAX. The NAS PAX Main Station BASH relevancy area MCA is illustrated on Figure 12.

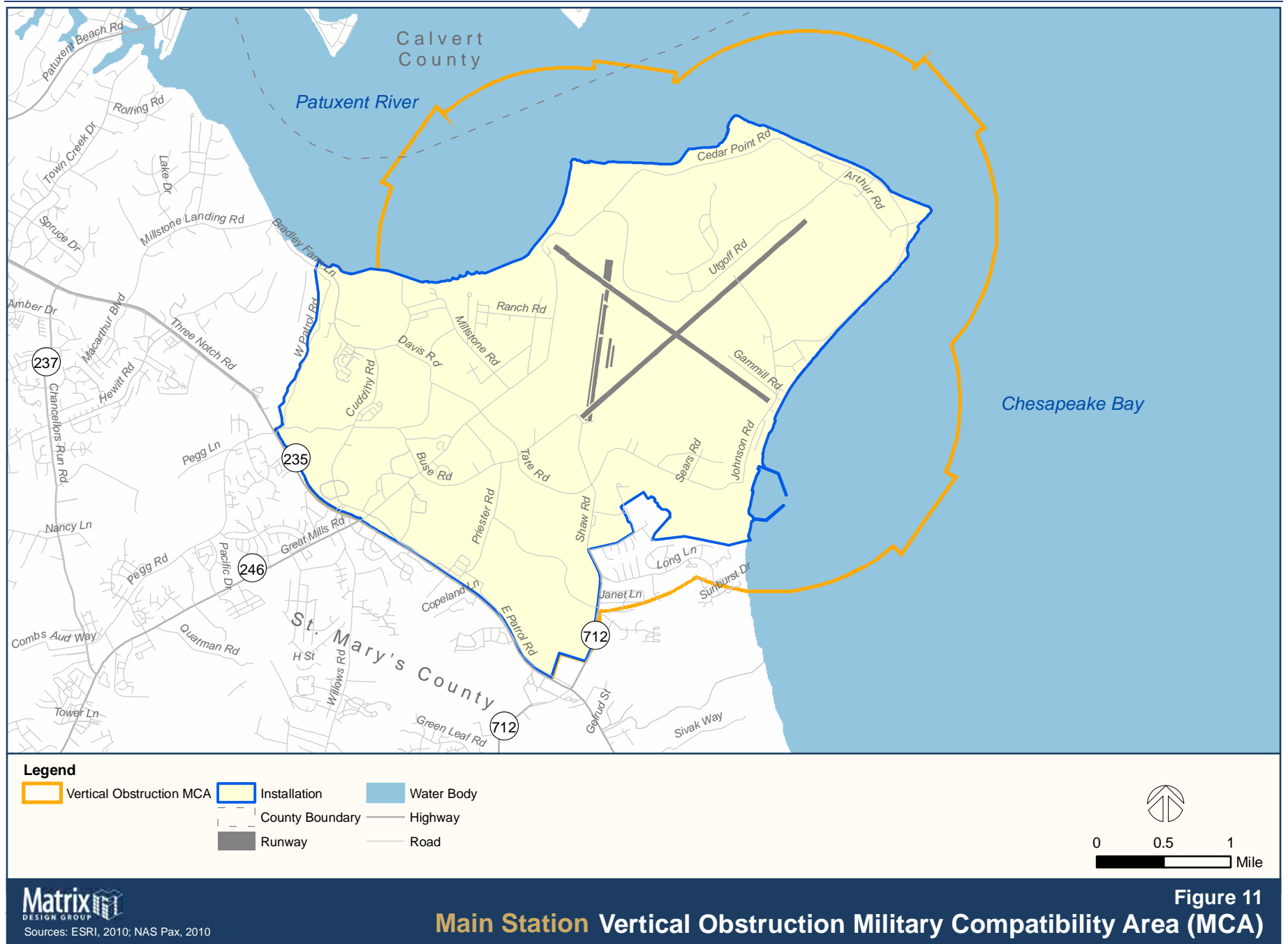
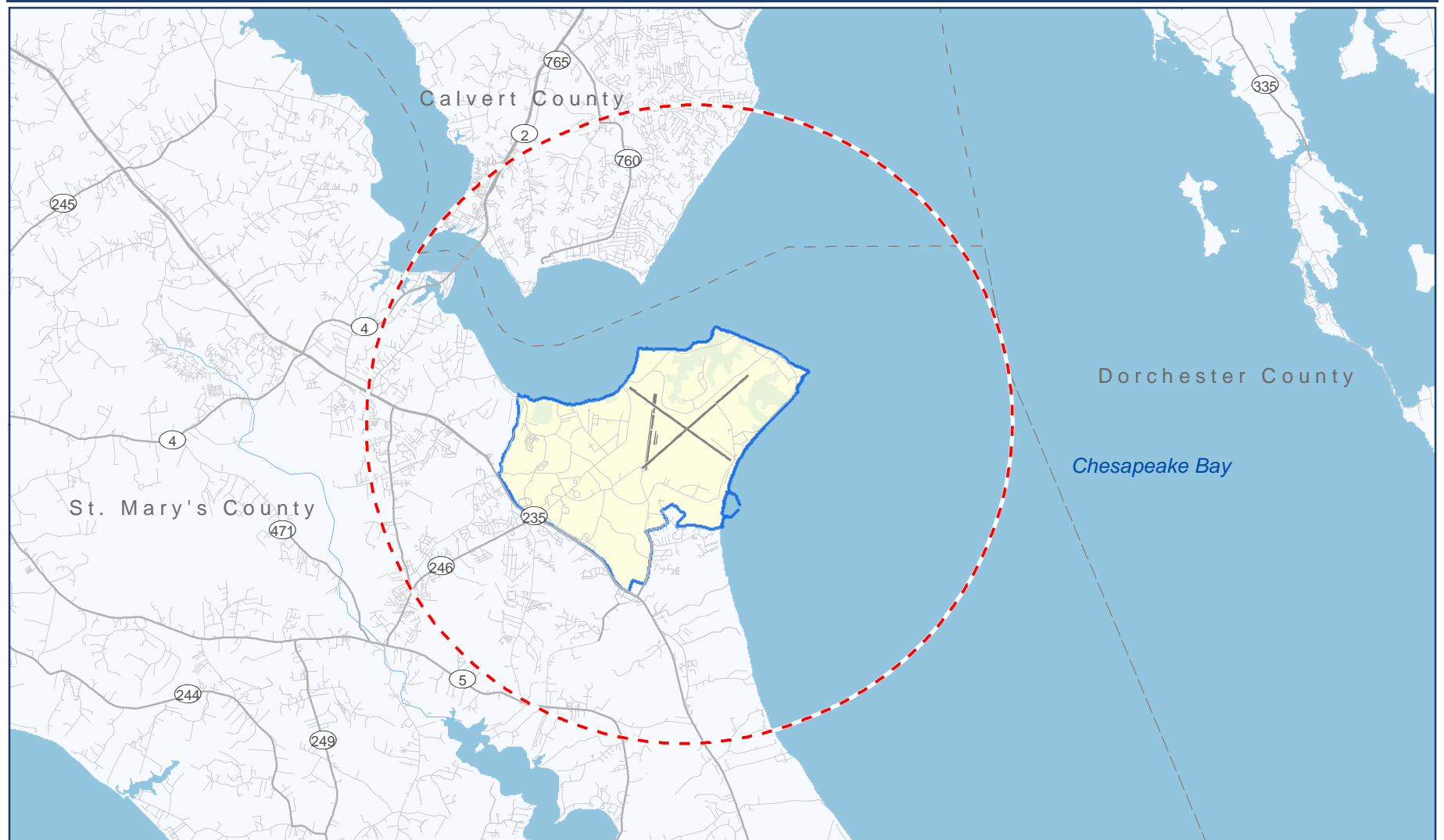


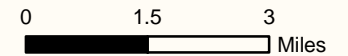
Figure 11
Main Station Vertical Obstruction Military Compatibility Area (MCA)

NAS_PAX_Fig11_MainStationVerticalObstructionMCA_20150113_JKC.pdf



Legend

- BASH MCA
- Installation
- Water Body
- County Boundary
- Highway
- Runway
- Road



Sources: ESRI, 2010; NAS Pax, 2010

Figure 12
Main Station BASH Military Compatibility Area (MCA)

NAS_PAX_Fig12_MainStatBASHMCA_20150113_JKC.pdf

Webster Field Military Compatibility Areas (MCAs)

Safety MCA

The Webster Field Safety MCA addresses areas that could be affected by low altitude helicopter, Unmanned Aerial Systems (UAS) and fixed-wing aircraft associated with military training operations. The Safety MCA at Webster Field includes only the Clear Zones due to a low number of flight operations as depicted in Figure 13. The Clear Zone is characterized by a higher risk for aircraft collisions due to location and types of aviation operations that occur based on statistical modeling of past aviation collisions.

The Clear Zones include recommended guidelines for the type of development that should not occur within them. These guidelines can be found in the DOD United Facilities Criteria (UFC) 3-260-01, under Land Use Compatibility Guidelines for Clear Zone and Accident Potential Zones. Within the CZ, most land uses are incompatible with aircraft operations. It is recommended that no development be located within CZs for the safety of the citizens and the pilots.

Strategies recommended for the Clear Zone include incorporating the Safety MCA into the AICUZ Overlay, continuing land acquisition efforts, considering land exchanges, and identifying APZs around Webster Field.

Noise MCA

The Noise MCA includes all land located off-installation within noise contours greater than 65 decibels, A-weighted (DNL) noise levels associated with military activities. This MCA is depicted in Figure 14.

For additional detail on noise contours, refer to the NAS PAX Noise MCA earlier in this section.

Vertical Obstruction MCA

The Webster Field Vertical Obstruction MCA includes the Inner Horizontal Surface and Approach-Departure Clearance Surface for the active runways and an additional one half nautical mile beyond these boundaries which restricts development of buildings and structures from 0 feet to 150 feet

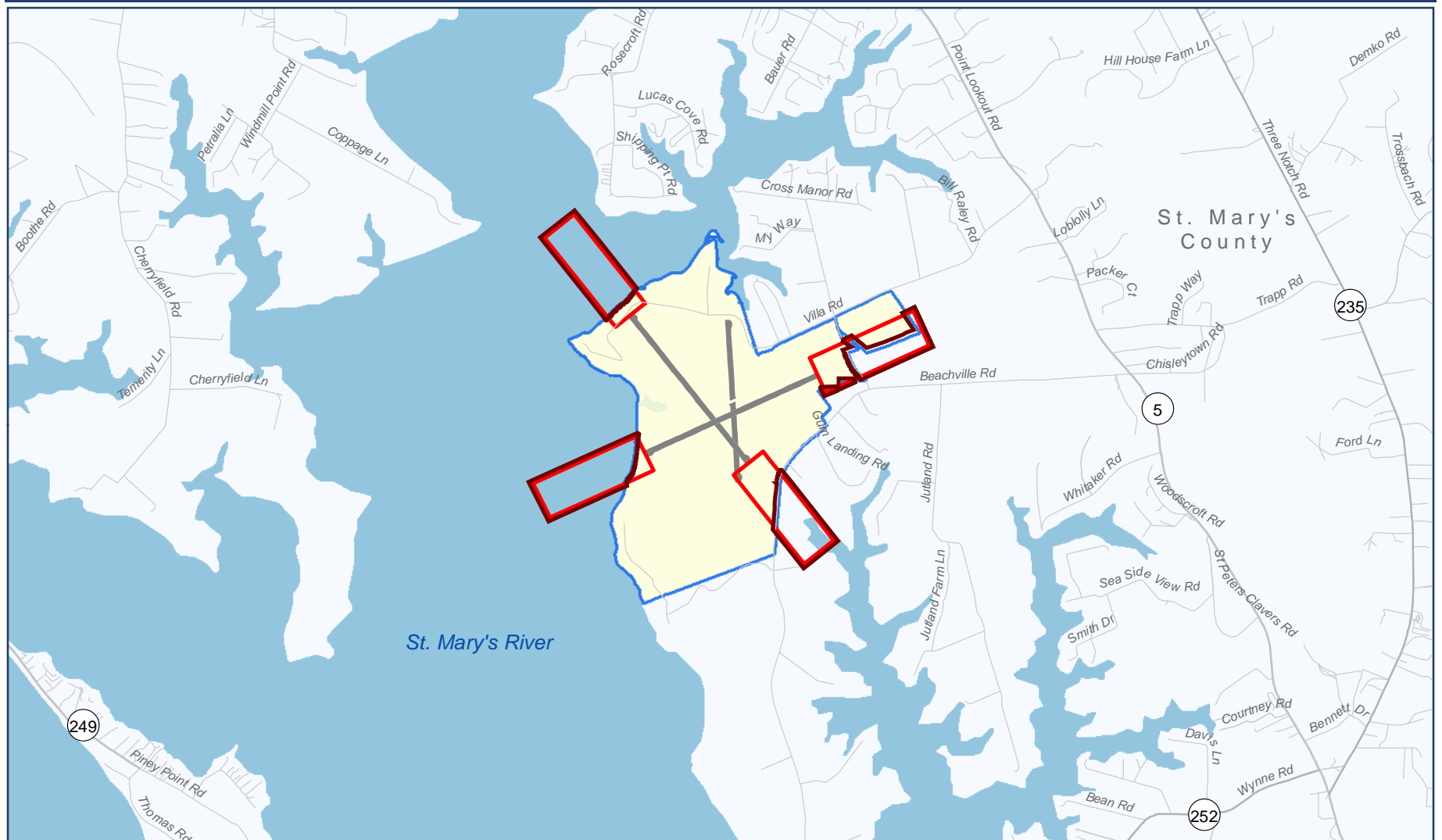
above mean sea level. The Webster Field Vertical Obstruction MCA is intended to emphasize the importance of following DOD imaginary surfaces with regard to structure height and is not intended to reduce or change guidance with regard to maximum height of structures. The Webster Field Vertical Obstruction MCA is illustrated on Figure 16.

For more detail on the Vertical Obstruction MCA, refer to the NAS PAX Main Station Vertical Obstruction MCA earlier in this section.

BASH MCA

The Webster Field BASH MCA extends out from Webster Field's primary surfaces (runways) a distance of five statute miles. This MCA is meant to include areas around the airfield with the highest safety concerns if concentrations of birds or bird-attractions uses were located there. Bird strikes with aircraft can have serious safety concerns, including the potential for loss of life and / or aircraft. Even minor bird strikes can cause costly repairs to aircraft and interfere with training missions.

The five-mile distance associated with the BASH MCA is an FAA recommended standard for managing bird attractants around runways. Developments like landfills, landfill transfer stations, developments with major water features are just some examples of uses that may attract birds within the approach and departure flight corridors in and around Webster Field. The Webster Field BASH relevancy area MCA is illustrated in Figure 16.



Legend

- Safety MCA
- CZ
- Installation
- Runway
- Water Body
- Highway
- Road



0 2,000 4,000
Feet



Sources: ESRI, 2010; NAS PAX, 2010

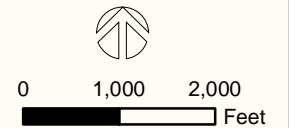
Figure 13
Webster Field Safety Military Compatibility Area (MCA)

NAS_PAX_Fig13_WebsterSafetyMCA_20150113_JKC.pdf



Legend

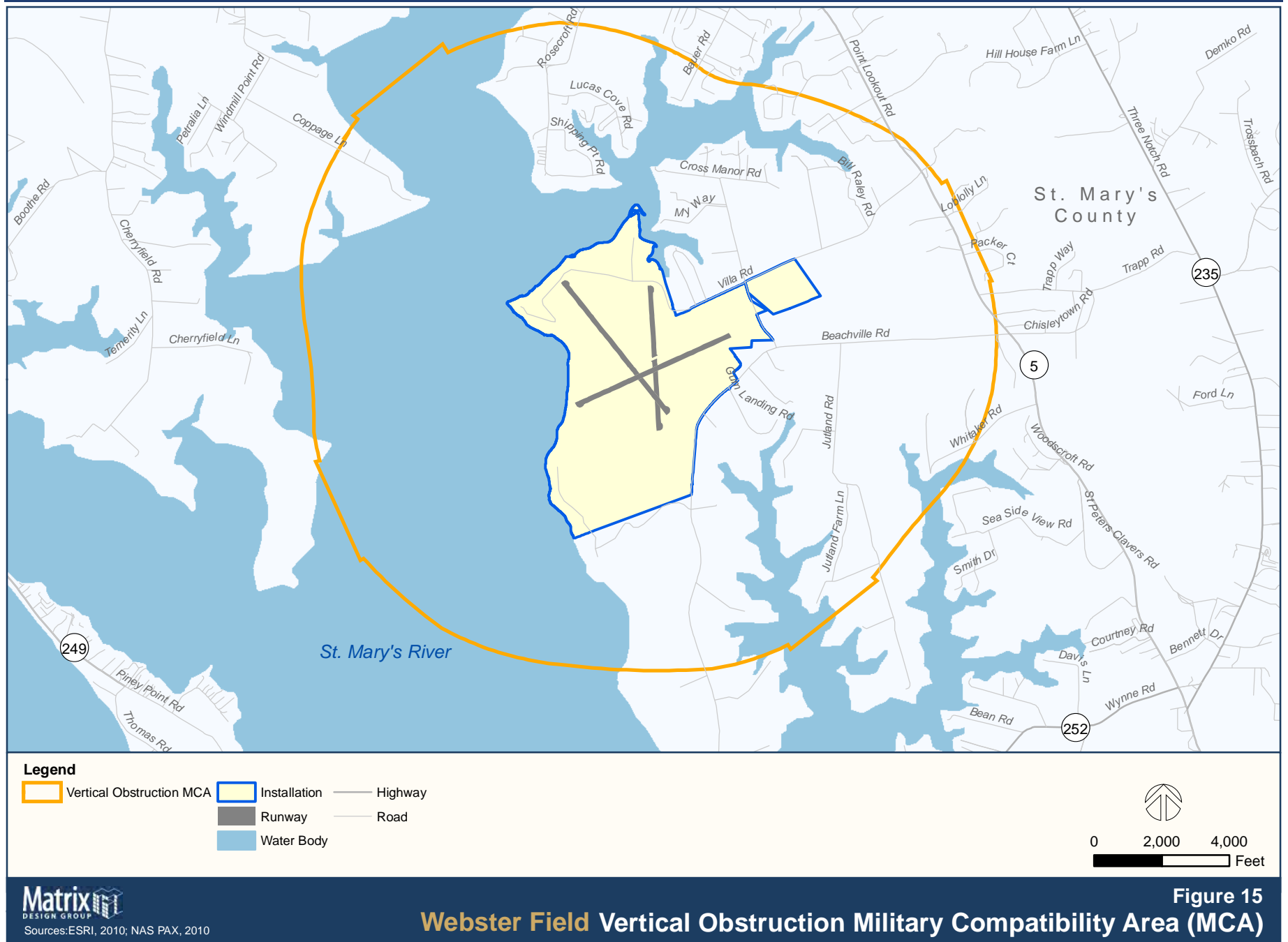
- Noise MCA
- Installation
- Runway
- Highway
- Road
- 65 dB Noise Contour (dB)
- Water Body



Sources: ESRI, 2010; NAS PAX, 2010

Figure 14
Webster Field Noise Military Compatibility Area (MCA)

NAS_PAX_Fig14_WebsterNoiseMCA_20150113a_JKC.pdf



NAS_PAX_Fig15_WebsterVerticalObstructionMCA_20150113_JKC.pdf



Figure 16
Webster Field BASH Military Compatibility Area (MCA)



Sources: ESRI, 2010; NAS Pax, 2010

NAS_PAX_Fig16_WebsterBASHMCA_20150113_JKC.pdf

6.4 How to Read the Implementation Plan

The recommended JLUS strategies developed were designed to address the issues identified during preparation of the JLUS. The purpose of each strategy is to:

- Avoid future actions, operations, or approvals that would cause a compatibility issue,
- Eliminate an existing compatibility issue,
- Reduce the adversity of an existing issue, or
- Provide for on-going communications and collaboration.

To make the strategies easier to use, they are presented in a table format that provides the strategy and information on when and how that strategy will be implemented. The NAS PAX JLUS Strategy Key, Table 7, on the following page highlights the format and content of the strategy table, and the following paragraphs provide an overview of how to read the information presented within each strategy. Issues are shaded rows with the applicable strategies in subsequent rows.

It is important to note that strategies may or may not be applicable to all agencies, depending upon further implementation details yet to be determined.

Issue / Strategy ID. The Issue / Strategy ID is an alpha-numeric number that provides a unique reference for each specific issue and strategy.

Geographic Area. This column indicates the applicable geographic area applicable to the strategy, if it relates to an area outside NAS PAX. Geographic Areas may consist of the following:

- County – a specific county only (county is identified)
- General – generally applicable throughout the Study Area; no specific geography

- Study Area – applies throughout the JLUS Study Area
- MCAOD – Military Compatibility Area Overlay District (a composite of all MCAs)
- MCA – Military Compatibility Area (Energy Development, Imaginary Surfaces, Noise, or Safety)

Strategy. In bold type is a title that describes the strategy. This is followed by the strategy statement that describes the action needed.

Timeframe. This column indicates the projected timeframe of each strategy. The timeframes are described below:

- **2015.** Strategy to be initiated by 2015 (within same year of JLUS completion)
- **2016.** Strategy to be initiated by 2016 (within 1-2 years of JLUS completion)
- **2018.** Strategy to be initiated by 2018 (3 to 5 years from JLUS completion)
- **On-going.** These issues need to be addressed on an on-going basis and addressed immediately.

Responsible Party. At the right end of the strategy table are a series of columns – one for each jurisdiction, military entity, agency, and organization with responsibility for implementing the JLUS strategies. If an entity has responsibility relative to implementing a strategy, a mark is shown under their name. This mark is one of two symbols that represent their role. A solid square (■) designates that the entity identified is responsible for implementing the strategy. A hollow square (□) designates that the entity plays a key supporting role, but is not directly responsible for implementation. The responsible parties are identified in the heading at the top of each page.

The JLUS Strategies are presented on the following pages organized alphabetically by compatibility factor.

Table 7. NAS PAX JLUS Strategy Key

Issue or Strategy ID	Geographic Area	Strategy	Timeline	Calvert County MD	Caroline County MD	Charles County MD	Dorchester County MD	Northumberland County MD	St. Mary's County MD	Talbot County MD	Westmoreland County VA	Wicomico County MD	City of Cambridge MD	Town of Leonardtown MD	FAA	NAS PAX	Other
ENERGY DEVELOPMENT																	
ED-2		Wind farm development. There is a need for a formal and coordinated site selection process and standard criteria for potential wind farm development. Interest in the use of wind turbines on agricultural lands as an opportunity for increasing profitability has grown; however, such uses would interfere with military operations and instrumentation viewsheds.															
ED-2A	Energy MCA	Identify and map locations suitable for wind energy development. Identify and publish locations for alternative energy development that are ideal for wind developers as well as compatibility with military operations. Develop a "Red, Yellow, Green" map that communicates and illustrates specific locations where structures that exceed a mutually agreed upon height should be prohibited to avoid incompatibility with the radar viewshed and HRAIZ.	2015				■			■						■	

Issue / Strategy Number:
Alpha-numeric identifier used for reference.

Geographic Area: Where each strategy applies. For example, if only MCA is indicated, then that strategy only applies to areas within the MCA.

Strategy:
Description of the strategy.

Timeline:
The expected initiation date for strategy implementation.

Responsible Party: The primary and partner responsible agencies. For example, the ■ denotes the primary agency who will take the lead in implementation. The □ denotes partner agency who will assist the primary agency in implementation.

Issue / Strategy ID	Geographic Area	Strategy	Timeline	Calvert County MD	Caroline County MD	Charles County MD	Dorchester County MD	Northumberland County VA	St. Mary's County MD	Talbot County MD	Westmoreland County VA	Wicomico County MD	City of Cambridge MD	Town of Leonardtown MD	NAS PAX	Other
ANTI-TERRORISM / FORCE PROTECTION																
AT/FP-1		Leased space off-base. NAS PAX leases and occupies office space off base that does not meet security requirements. Proper AT/FP requirements are not met at these sites that are located within the community.														
AT/FP-1A	St. Mary's County	Enhance existing partnerships. Leverage existing entities and partnerships, share information on NAS PAX space requirements and collaborate on ways to meet these requirements through on and off-base development. Additional partners: Community business leaders, economic development authorities.	2016						■						■	
AT/FP-2		Waterfront access to base. NAS PAX main station is accessible via the Chesapeake Bay and Patuxent River. High levels of waterway traffic create security concerns when boaters approach NAS PAX shorelines.														
AT/FP-2A	General	Increase signage and buoy placement. Increase signage and strategic placement of buoys to warn boaters they are approaching an active military installation where access is prohibited.	2016												■	
AT/FP-2B	General	Increase boater awareness of NAS PAX location. Increase boater awareness of NAS PAX location and prohibited shoreline areas by providing informational brochures at marinas, at locations where fishing licenses are issued, and when boats are registered. Other partners: Somerset County, marinas, bait and tackle shops, DNR (Service Centers / online / by mail), and sport license agents.	2016	■			■	■	■	■	■	■				■

Issue / Strategy ID	Geographic Area	Strategy	Timeline	Calvert County MD	Caroline County MD	Charles County MD	Dorchester County MD	Northumberland County VA	St. Mary's County MD	Talbot County MD	Westmoreland County VA	Wicomico County MD	City of Cambridge MD	Town of Leonardtown MD	NAS PAX	Other
BIOLOGICAL RESOURCES																
BR-1		<p>Wildlife refuges in region. Nesting birds and other wildlife species could be impacted by military exercises. This is exacerbated during breeding and migrating times, working against investments that have been made to protect threatened species.</p>														
BR-1A	MCAOD	<p>Seek REPI funding to protect area of environmental concern. Enter into encroachment partnering agreements with eligible entities under 10 U.S.C. §2684a to acquire environmentally important lands that, if developed, would adversely impact the military mission. This authority allows the Secretary of a military department to partner with another entity to acquire real property in the vicinity of, or ecologically related to, a military installation or military airspace, to limit encroachment or other constraints on military training, testing and operations. Eligible entities include a State and its subdivisions, and private entities that have, as their principal organizational purpose or goal, the conservation, restoration, or preservation of land and natural resources, or a similar purpose or goal. Other partners: Somerset County, Virginia Land Conservation Fund, Virginia Open Space Lands Preservation Trust Fund, Lower Shore Land Trust, Chesapeake Conservancy, State of Maryland, and State of Virginia.</p>	2018	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Issue / Strategy ID	Geographic Area	Strategy	Timeline	Calvert County MD	Caroline County MD	Charles County MD	Dorchester County MD	Northumberland County VA	St. Mary's County MD	Talbot County MD	Westmoreland County VA	Wicomico County MD	City of Cambridge MD	Town of Leonardtown MD	NAS PAX	Other
BR-1B	Caroline County / Dorchester County	<p>Strengthen Partners in Flight (PIF) program to address migratory bird species potentially impacted by military activities.</p> <p>The PIF program provides a forum for natural resources managers from a diverse group of public, private, and international agencies to cooperate to achieve enhanced protection of wildlife and standardized policies and procedures for reporting and studying wildlife. One such program is the Monitoring Avian Productivity and Survivorship (MAPS) initiative, which focuses on the protection of the neotropical migratory bird resource. MAPS research should continue at NAS PAX, with all data contributed to the national database at the Institute for Bird Populations.</p> <p>Other partner: Somerset County.</p>	2018		■		■								■	■
BR-1C	General	<p>Expand existing environmental programs and outreach.</p> <p>Seek to expand partnerships with existing environmental organizations, state and federal agencies, conservation groups, academic groups, etc. to assist in the development, improvement, expansion, and implementation of best management practices. Potential partnerships may include:</p> <ul style="list-style-type: none"> ■ Nature Conservancy. ■ The USFWS, to provide assistance in matters that concern the conservation, protection, and management of fish and wildlife species. 	2018	■	■	■	■	■	■	■	■	■			■	■

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BR-1C (cont'd)		<ul style="list-style-type: none"> ■ The USFWS Chesapeake Bay Ecological Services Field Office, to provide assistance in the management of invasive species. ■ The MDNR Wildlife and Heritage Service, to provide assistance in matters that concern the conservation, protection, and management of fish and wildlife species. ■ The MDNR Natural Heritage Program, to provide information and guidance related to rare, threatened, and endangered species information. ■ The Alliance for the Chesapeake Bay, to provide assistance in meeting the mandates of the Agreement of Federal Facilities on Ecosystem Management in the Chesapeake Bay. ■ Ducks Unlimited, to coordinate with natural resources staff for waterfowl monitoring and habitat enhancement. <p>Other partner: Somerset County, Nature Conservancy, USFWS, MDNR Wildlife and Heritage Service, Alliance for the Chesapeake Bay, and Ducks unlimited.</p>														

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INTERAGENCY COORDINATION / COMMUNICATION																
COM-1		<p>Minimal communication amongst agencies and public about military operations. Local agencies and the public feel that efforts to communicate and coordinate with the Navy are dismissed or discouraged when addressing issues or concerns related to military installations and operations.</p>														
COM-1A	General	<p>Establish a JLUS Coordination Committee. Establish a JLUS Coordination Committee to maintain efficient and effective coordination among the JLUS partners and to oversee the implementation of JLUS recommendations. The JLUS Coordination Committee should meet on a regular basis as agreed upon by the Committee and be responsible for establishing effective and timely means of communication for the purpose of coordinating and addressing compatibility concerns and issues. Members should include representatives from Calvert County, Charles County, Caroline County, Dorchester County, Talbot County, Wicomico County, St. Mary's County, Northumberland County, and Westmoreland County as well as other community partners as determined appropriate. Where possible, look to opportunities to create a coordination entity that can provide a regional look, integrating with efforts around other installations in the region where joint planning or meetings is advantageous to members.</p>	Ongoing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				<input type="checkbox"/>	<input checked="" type="checkbox"/>

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COM-1A (cont'd)		Other partners: Tri-County Council for Southern Maryland (primary partner), Somerset County (supporting partner).														
COM-1B	General	<p>Conduct a Good Neighbor Program.</p> <p>NAS PAX should conduct, on a bi-annual basis, a Good Neighbor Program where they send out letters to property owners within the region inviting them to a NAS PAX Open Forum. The purpose of the meeting will be to allow for an open exchange of information to maintain transparent communication and provide a platform for NAS PAX to inform neighbors and interested citizens of any upcoming mission changes or operations and maintenance events that may have an impact on the neighbors and whereby the adjacent property owners can provide input and pose questions to Navy representatives.</p> <p>The open houses would be held in rotating locations on or near NAS PAX and within the region on a semi-annual basis and require participation by each local jurisdiction.</p> <p>Other partner: Somerset County.</p>	Ongoing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				<input checked="" type="checkbox"/>	<input type="checkbox"/>

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COM-1C	General	<p>Allow public review of military planning documents. NAS PAX, in cooperation with NDW, should provide public versions of key planning documents for review and comment prior to finalization. Key planning documents could include, but not be limited to, the following:</p> <ul style="list-style-type: none"> ■ AICUZ Updates and brochures ■ RAICUZ Updates and brochures ■ Master Plan Updates ■ Integrated Cultural Resource Management Plan ■ Integrated Natural Resource Management Plan ■ Other documents as appropriate 	Ongoing												■	
COM-1D	General	<p>Establish an NAS PAX outreach program. NAS PAX should create an outreach plan to share information with the community. The public outreach program should describe outreach activities to include tours of the installation, development of informational brochures to be mailed to neighbors and posted on the NAS PAX website, identification of a single public relations point of contact for NAS PAX, and making contact information widely available. It should also include a military and community communication protocol directory that identifies the different level of communication channels between the appointed and elected officials, to staff, to the general public and NAS PAX.</p>	Ongoing												■	

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COM-1D (cont'd)		As part of the outreach program, NAS PAX should host regularly scheduled open houses for the public to provide an overview of training activities, construction, or other items of public interest. This forum should also allow residents the opportunity to comment on concerns. An open house on an annual basis would be an option to consider. Any open house or activities that invite civilians onto NAS PAX should be deconflicted with installation activities such as changes in base command or senior leadership, and other open house activities.														
COM-1E	Calvert County / St. Mary's County	<p>Establish sub-committee focused on regional traffic concerns.</p> <p>Establish a joint sub-committee focused on traffic issues associated with recent gate changes and anticipated economic development in the area. Jointly work together to improve traffic conditions along Three Notch Road in particular through mutually agreed-upon road, gate and intersection improvements.</p> <p>Other partner: JLUS Coordination Committee (primary partner), Calvert-St. Mary's MPO (supporting partner).</p>	Ongoing	<input type="checkbox"/>					<input type="checkbox"/>						<input type="checkbox"/>	<input checked="" type="checkbox"/>

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COM-2		<p>Community awareness of military operations varies across region.</p> <p>Communities located furthest from NAS PAX are often unaware of planned exercises and military operations. Residents who call their local government contacts with concerns often receive inaccurate responses due to a lack of awareness or notification of planned NAS PAX activities.</p>															
COM-2A	General	<p>Strengthen relationship with ongoing UAS research being conducted by local universities through the Mid-Atlantic Aviation Partnership.</p> <p>Increase public awareness of this program through on-site and interactive events to preclude potential confusion regarding the introduction of drones into the National Air Space.</p> <p>Other partners: Virginia Tech, University of Maryland, FAA.</p>	Ongoing	■	■	■	■	■	■	■	■	■			■	□	
COM-2B	General	<p>Cooperate with the Navy to expand communication efforts with all jurisdictions within the study area.</p> <p>NAS PAX should initiate enhanced communication by meeting with each county within its area of influence to develop a plan for increasing community awareness and support of NAS PAX operations. As part of this, NAS PAX should widely distribute materials associated with operations that may result in noise impacts with a focus on identification of the appropriate contact with questions and / or concerns associated with noise events as they occur.</p> <p>Other partner: Somerset County.</p>	Ongoing	□	□	□	□	□	□	□	□	□	□	□	■	□	

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COM-2C	General	<p>Develop an Enhanced Real Estate Disclosure Statement.</p> <p>In conjunction with the development of a military operations nuisance disclaimer, include appropriate information about NAS PAX operations, the NAS PAX Operating Area, use of civilian airports, and potential noise and vibration effects that may result from certain types of events and activities performed (including supersonic flight). The disclosure should state that the building/structure for sale or lease is located within the NAS PAX Operating Area and that aircraft operations are conducted within the region that may have an impact on the community such as noise or vibration.</p> <p>Work with state real estate boards, local real estate representatives, and the development community to develop and implement adequate language for inclusion in disclosure notices. Technical information should be provided by and approved by NAS PAX prior to release. Consider developing the real estate disclosure statement in conjunction with other area JLUS studies being conducted to promote consistency.</p> <p>Other partners: Virginia Military Advisory Council, Virginia State Real Estate Board, Maryland Real Estate Commission, Federal Real Property Association, Virginia Association of Counties, and Virginia General Assembly.</p>	Ongoing	■	■	■	■	□	■	■	□	■	□	□	□	■

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COM-2D	General	<p>Develop information to facilitate accurate disclosures.</p> <p>Provide current and adequate information to facilitate informed decisions by jurisdictions, developers and interested citizens relative to a property's location relative to military operation areas.</p>	Ongoing												■	
COM-2E	Dorchester County / Wicomico County	<p>Strengthen outreach to Eastern Shore communities.</p> <p>NAS PAX should strengthen its outreach efforts and coordination with the Eastern Shore communities that are further away from the base. These communities are not as heavily impacted by day-to-day operations, but they are within the NAS PAX Operating Area and may have some impacts or could impact future operations at NAS PAX.</p> <p>Other partner: Somerset County.</p>	Ongoing				☐					☐			■	☐
COM-2F	Study Area	<p>Educate public about relationship between military presence and wildlife habitat.</p> <p>Continue to increase awareness of NAS PAX's existing partnerships with natural resources and conservation groups to identify methods of protection.</p> <p>Other partners: Somerset County, Chesapeake Conservancy, The Nature Conservancy, USFWS, American Bird Conservancy, National Audubon Society, Chesapeake Bay Foundation, National Wildlife Federation, and Ducks Unlimited.</p>	Ongoing	☐	☐	☐	☐	☐	☐	☐	☐	☐			■	☐

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COM-2G	General	<p>Increase public education and awareness of Part 15 devices.</p> <p>Educate the general public about programs and equipment that have been developed by garage door manufacturers to minimize and / or eliminate problems associated with the use of Part 15 devices.</p>	Ongoing	■			■	■	■	■	■				■	
COM-2H	MCAOD	<p>Develop and distribute property owner educational materials.</p> <p>An information packet should be developed that provides information on applicable regulations that govern development within the NAS PAX operating area.</p>	Ongoing	■	■	■	■	■	■	■	■	■			□	
COM-2I	MCAOD	<p>Expand outreach to boating community.</p> <p>Engage boating community through formal education session to increase awareness of the range area. This could include methods such as:</p> <ul style="list-style-type: none"> ■ increased and enhanced signage, ■ engagement of boating community through marinas and boating associations, ■ expanded radio communications, and ■ requirement of all boaters in area to have an onboard radio (potential for equipment rental option) <p>Other partner: Somerset County.</p>	Ongoing	■	■	■	■	■	■	■	■	■	■	■	■	■

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COM-2J	MCAOD	<p>Increase public understanding of noise sources.</p> <p>Increase community awareness of flight schedules and military operations throughout the entire NAS PAX Operating Area through the use of local media sources, newsletters, brochures, and annual outreach functions hosted by NAS PAX in cooperation with each sub-area or regional entity.</p> <p>Other partner: Somerset County.</p>	Ongoing	■	■	■	■	■	■	■	■	■	■	■	■	■
COM-2K	MCAOD	<p>Consider developing an airfield / airport awareness program.</p> <p>Consider developing an airfield / airport awareness program targeted to the landowners and homeowners to increase awareness of the effects of aircraft operations within NAS PAX Operating Areas.</p>	Ongoing	■			■	■	■	■		■			■	
COM-2L	Energy Dev MCA	<p>Educate the public and local leaders about the NAS PAX HRAIZ and potential safety hazards.</p> <p>Increase public awareness and understanding of the HRAIZ, its extents, and potential height contours that can illustrate the importance of this area to the military and the potential line-of-sight impacts that could occur if projects are uncoordinated.</p> <p>Other partner: Somerset County.</p>	Ongoing	■	■	■	■	■	■	■	■	■	■	■	■	■

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COM-2M	MCAOD	Educate local builders on sound attenuation. Work with local construction and development organizations to ensure that builders and relevant skilled trades are familiar with the noise attenuation measures, how to incorporate them in a cost-effective manner and how to market them as a benefit to clients and prospective clients.	Ongoing	■	■		■		■	■		■			<input type="checkbox"/>	
COM-3		Local point of contact at NAS PAX. Both residents and local leaders do not know who to contact at NAS PAX when questions or concerns arise.														
COM-3A	General	Maintain NAS PAX designated CPLO. Seek assistance from NAVFAC to maintain a CPLO that is designated for NAS PAX only as opposed to the NDW region.	COMPLETED												■	
COM-3B	General	Make NAS PAX points of contacts more widely known. Advertise and increase awareness of NAS PAX Public Affairs Office and other contact numbers for all community complaints and inquiries. Communication procedures, including methods for providing input, posing inquiries, and expected response time should be made publicly available through the NAS PAX and local jurisdiction websites, social media sources, and posted in public facilities such as community centers, municipal buildings, and local newsletters.	Ongoing	■	■	■	■	■	■	■	■	■			■	

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COM-3C	General	<p>Expand communication efforts with all jurisdictions within the study area.</p> <p>Update jurisdictions' and regional planning organizations websites to recognize NAS PAX, its mission, location, links to the NAS PAX webpage, contact information for key organizations, and relevant installation activities potentially involving the communities.</p> <p>Other partner: Somerset County</p>	Ongoing	■	■	■	■	■	■	■	■	■	■	■	□	■
COM-3D	General	<p>Establish internal information liaisons.</p> <p>Each jurisdiction and NAS PAX should, if they have not already, identify an internal liaison within their organization that is responsible for relaying information from outside parties to their organization to ensure that all entities are aware of pertinent information and information does not stop at one person.</p> <p>Other partner: Somerset County</p>	Ongoing	■	■	■	■	■	■	■	■	■	■	■	■	■

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COM-4		<p>Regional coordination does not address all four sub areas. Although there are four regional planning organizations (Mid Shore Regional Council, Lower Shore Land Trust, Northern Neck Planning District, and Tri-County Council for Southern Maryland), there is no effort to address common issues from a broader perspective.</p>															
COM-4A	General	<p>Improve methods and extent of community outreach. Engage community members to determine preferable means and outlets of communication. Continue and expand military operations notification to as many outlets as possible to inform residents of expected noise and aviation impacts. The NAS PAX Public Affairs Office (PAO) should collaborate with other Navy installations for enhancing media and social network for notifications. This improved process should seek to identify methods to obtain feedback on the effectiveness of notifications. Other partners: Somerset County, other Navy installations.</p>	Ongoing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input checked="" type="checkbox"/>	<input type="checkbox"/>	
COM-5		<p>No method for Navy input into development review process. There is no established role or process for NAS PAX to provide input into community development proposals within all jurisdictions affected by military operations. Oftentimes military officials are unaware of upcoming developments and rely on monitoring newspapers and periodicals for potential conflicts. Both the military and the public are typically unaware of potential conflicts prior to advancing development initiatives.</p>															
COM-5A	General	<p>Include an NAS PAX in an advisory capacity to local planning commissions and organizations. Establish a formal agreement between all study area jurisdictions and NAS PAX to formalize a process that provides copies of certain types of development</p>	Ongoing	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	

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COM-5A (cont'd)		<p>proposals, rezoning, and other land use or regulation changes for lands located within the NAS PAX influence area for review and comment. For jurisdictions in the state of Virginia, the agreement should build upon provisions of the State of Virginia Code including Sections 15.2-2211, 15.2-2294, 15.2-2283, 15.2-2200, and 15.2-2204 that promote coordination between jurisdictions and military installations. The agreement should address an effective method that promotes a productive communication and coordination process that can be maintained and reproduced in the future. This supports a proactive approach for identifying potential conflicts early in the proposed development application. Review periods shall conform to existing community processes for providing comment.</p> <p>The process of formalizing Navy review and comment should include:</p> <ul style="list-style-type: none"> ■ Definition of project types that require review ■ Definition of project types that require military attendance at pre-application meetings, if applicable ■ Identification of the points of contact for all coordination ■ Formal procedures for requesting and receiving comments ■ Standard timelines for responses consistent with State law and local/county procedures 														

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COM-5A (cont'd)		<p>The Navy representative will provide technical information on items being considered, but shall not directly vote to approve, conditionally approve, or deny a project or development application.</p> <p>Procedures should be reviewed annually and updated as appropriate by the JLUS Coordination Committee.</p> <p>Other partner: Somerset County.</p>														
COM-5B	General	<p>Seek regular input from Navy representatives for technical assistance as needed.</p> <p>Request a Navy representative presence in processes associated with plan updates, code updates, and development review processes on an as-needed / as-requested basis.</p> <p>Other partner: Somerset County.</p>	Ongoing	■	■	■	■	■	■	■	■	■	■	■	□	■

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ENERGY DEVELOPMENT																
ED-1		Solar panels near flight paths. The use of solar panels can adversely affect military operations if not properly sited.														
ED-1A	MCAOD	Develop solar siting guidelines. Develop guidelines for proper siting and use of appropriate solar technologies near airfields, flight corridors, and beneath military airspace that include: <ul style="list-style-type: none"> ■ updating zoning ordinances to specify non-reflective panels for non-residential applications and ■ requiring review and coordination by Navy prior to permit approval. 	2016	■	■	■	■	■	■	■	■	■			■	
ED-2		Wind energy development. There is a need for a formal and coordinated site selection process and standard criteria for potential wind energy development. Interest in the use of wind turbines on agricultural lands as an opportunity for increasing profitability has grown; however, such uses would interfere with military operations and instrumentation viewsheds.														

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ED-2A	Energy Dev MCA	<p>Identify and map locations suitable for wind energy development.</p> <p>Identify and publish locations for alternative energy development that are ideal for wind developers as well as compatibility with military operations. Develop a "Red, Yellow, Green" map that communicates and illustrates specific locations where structures that exceed a mutually agreed upon height should be prohibited to avoid incompatibility with the radar viewshed and HRAIZ.</p> <p>Other partner: Somerset County.</p>	Ongoing	■	■	■	■	■	■	■	■	■			■	■
ED-2B	Energy Dev MCA	<p>Coordinate with wind developers to reach an agreement that supports wind energy and military missions.</p> <p>Seek local support to develop agreements between the military, county, and wind energy developers that can be used to support wind projects by identifying conditions that will allow for mission sustainment and economic feasibility of proposed projects.</p>	Ongoing	■	■	■	■	■	■	■	■	■			□	

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ED-2C	Energy Dev MCA	<p>Coordinate with DOD Siting Clearinghouse.</p> <p>The DOD Siting Clearinghouse requirements and standards published in Title 32, Code of Federal Regulations, Part 211 shall advise and guide the process to facilitate the early submission of renewable energy project proposals to the Clearinghouse for military mission compatible review.</p> <p>Amend applicable local planning documents (comprehensive plans, regional plans, and energy system ordinances) to incorporate procedures for coordinating alternative energy development applications with the DOD Siting Clearinghouse.</p> <p>Other partners: DOD Clearinghouse, Somerset County.</p>	Ongoing	■	■	■	■	■	■	■	■	■			□	■

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ED-3		LNG tanker routes through range areas. Liquefied Natural Gas is transported along the Patuxent River shipping corridor, including areas that may have weapons drops, laser testing, rocket firings and low level supersonic flights. Continued growth of this industry where personnel may routinely be located in test areas may pose disturbances to Navy operations.														
ED-3A	Calvert County	Monitor potential energy plant expansions. Continue to monitor Cove Point Expansion Project efforts and consult with NAS PAX as future changes are proposed. Existing relationships have resulted in minimal issues. Continuation of this relationship and review process should assist in conflict avoidance. Other partner: Dominion Cove Point.	2016	■											■	□
FREQUENCY SPECTRUM CAPACITY																
FS-1		Widespread use of wireless devices. Frequency interference issues have increased as wireless demands and technology use skyrockets. Residents can and have experienced inoperable garage and car doors as well as other systems sharing frequency bands.														
FS-1A	General	Acquire and improve RF spectrum analysis technology devices. Pursue acquisition and development of "RF spectrum analyzer" technologies used to detect interference between frequency bands. This tool can be used to identify interference from on-installation sources including military and public/commercial users.	2018												■	

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FS-1B	General	<p>Ensure compatible frequencies.</p> <p>The Federal Communications Commission is the government entity responsible for managing frequency usage. The military is assigned certain frequencies to use that generally do not interfere with civilian uses. The continued usage of only assigned frequencies should ensure no interference between military and civilian uses.</p> <p>Other Partner: Federal Communications Commission.</p>	2018												<input checked="" type="checkbox"/>	<input type="checkbox"/>
FS-1C	Energy Dev MCA	<p>Establish procedures to avoid frequency conflicts / issues.</p> <p>The Navy should coordinate with jurisdictions on RF projects in the Study Area that could impact off-installation communications. The criteria that triggers coordination includes:</p> <ul style="list-style-type: none"> ■ tower height, ■ proximity to NAS PAX, ■ power emission from tower sources, and ■ high output transmission devices. <p>Other partner: Somerset County.</p>	2018	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
FS-2		<p>Vertical elements.</p> <p>Tall structures that are at currently unregulated heights (less than 199 feet) can result in vertical obstructions, which in turn cause frequency issues and electromagnetic interference.</p>														
FS-2A		<p>For strategies that address this issue refer to Strategies VO-1B and VO-2A.</p>														

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FS-3		Disruption to Communications Equipment. Frequency interference is a great concern around airfields where the loss of communication has caused both the crash of military systems and aviation equipment critical to uninterrupted communication and safe use of systems.														
		For strategies that address this issue refer to Strategies FS-1A, FS-1B, and FS-1C.														
FS-4		Disruption to emergency service communications equipment. Local emergency responders experience interruptions in radio frequency. Radio devices used in emergency response have unexpectedly turned off or failed because of frequency problems.														
		For strategies that address this issue refer to Strategies FS-1A, FS-1B, and FS-1C.														
LAND USE																
LU-1		Local planning policies and regulations do not address military compatibility. Compatibility with NAS PAX is not addressed in Comprehensive Plans, Zoning Codes, or other development ordinances throughout the region.														
LU-1A	Noise MCA	Apply St. Mary's County AICUZ Overlay to include Webster Field. Update / expand existing AICUZ Overlay that is currently in use by St. Mary's County for NAS PAX Main Station environs to apply to Webster Field.	2016						■						□	
LU-1B	MCAOD	Define and establish Military Compatibility Areas (MCAs). Create a Military Compatibility Area Overlay District (MCAOD) containing Military Compatibility Areas (MCAs) that reflect the types and intensity of compatible uses. The MCAOD is the collective geographic area of all of the MCAs combined.	2016	■	■	■	■	■	■	■	■	■			□	■

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LU-1B (cont'd)		<p>The MCAs established should be used by local jurisdictions to identify areas where specific compatibility issues are more likely to occur and address ways to avoid compatibility issues. The MCA's should include:</p> <p>Safety MCA - Includes the Clear Zone (CZ) and Accident Potential Zones (APZs) I and II.</p> <p>Noise MCA - Includes areas within the 65 ADNL (62 CDNL) contour.</p> <p>Energy Development MCA - Encompasses the areas within the radar viewshed and HRAIZ to limit heights of structures and identify potential mitigation measures to enable development of wind turbines that are compatible with military operations.</p> <p>Vertical Obstruction MCA – Based on the DOD imaginary surfaces map, horizontal area which limits development of buildings and structures from zero to 150 feet above mean sea level and the approach-departure clearance surface.</p> <p>BASH MCA – Encompasses a five statute mile radius from the primary surfaces of the airfield for managing bird attractants around runways.</p> <p>Where appropriate, the jurisdictions should incorporate the MCAOD and MCA boundaries on their zoning map and future land use maps and include the zones on their websites for easy access by the public.</p>														

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LU-1B (cont'd)		Other partner: Somerset County.														
LU-1C	MCAOD	<p>Update comprehensive plans to include military compatibility policies.</p> <p>Policies that support the proposed MCAs and encourage uses that are compatible with NAS PAX operations should be incorporated into jurisdictions' comprehensive plans. Update and adopt future land use maps and supporting goals, objectives, and policies that encourage compatible growth around NAS PAX. Navy representatives should be included as a stakeholder in the development and regular updates of the plans.</p> <p>Other partner: Somerset County.</p>	2016	■	■	■	■	■	■	■	■	■			<input type="checkbox"/>	■
LU-1D	MCAOD	<p>Make existing compatibility guidance easily accessible to the public.</p> <p>Incorporate the NAS PAX AICUZ and RAICUZ and DOD Compatibility Guidelines as a factor considered in the evaluation of existing and future land use proposals.</p> <p>Other partner: Somerset County.</p> <p>For other strategy that addresses this issue refer to Strategy COM-2H.</p>	2016	■	■	■	■	■	■	■	■	■			<input type="checkbox"/>	■

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LU-2		Land use compatibility around regional airports with military operations. Although regional airports are identified in some land use plans in the region, the military use of non-military airports (Easton Airport, Salisbury-Ocean City Wicomico Regional Airport, and Cambridge-Dorchester Regional Airport) is not addressed.															
LU-2A	MCAOD	<p>Establish airport overlay zoning districts around all regional airports used by NAS PAX.</p> <p>An airport overlay zoning district ordinance should be developed within the jurisdictions that have public airports that are used by NAS PAX aircraft. The ordinance should include:</p> <ul style="list-style-type: none"> ■ purposes of the district, ■ definitions, ■ airport zones, airport zone height limitations, ■ permits required, ■ use restrictions, ■ nonconforming uses, ■ variances, ■ conflicting regulations, and ■ amending the official zoning map by the adoption of an official supplementary airport overlay zoning map. 	2016		■		■			■		■				<input type="checkbox"/>	
LU-2B	MCAOD	<p>Update local zoning codes.</p> <p>Update zoning map and zoning code to be consistent with any changes or updates that may have occurred to the future land use plan / comprehensive plan.</p>	2016		■		■	■		■	■	■				<input type="checkbox"/>	

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LAND / AIR/ SEA SPACE COMPETITION																
LAS-1		<p>Recreational boaters and fisherman in range area.</p> <p>There is competition for use of the water among recreational boaters and fishermen. Sea spaces need to be cleared near Webster Field and near the marine targets when active operations are occurring. Waterman and recreational boaters often do not understand or are unaware of safety requirements or Navy activities that would affect public waterways. Clearing of the waterways to maintain safe clearance distances can cause delays in scheduled activities and training.</p>														
		For strategy that addresses this issue refer to Strategy COM-2I.														
LEGISLATIVE INITIATIVES																
LI-1		<p>Shared use of civilian airports.</p> <p>Navy aircraft are no longer able to use regional airports to their full potential due to the loss of federal (FAA) contracts and agreements.</p>														
LI-1A	General	<p>Conduct airport feasibility studies.</p> <p>Conduct feasibility and utilization studies that identify the number of flight events by user and the economic benefit provided by the Navy's use of regional airports.</p>	2016		■		■			■		■			■	
LI-1B	General	<p>Seek federal assistance.</p> <p>Seek federal assistance to formalize use of regional airports by the Navy through renewed contracts and agreements. Develop formal memorandums of agreements regarding use of regional airports by military aircraft. Details should include the type of activities performed at each regional airport, the Navy's need for this use, and the benefits provided to each airport as a result of Navy operations.</p>	2015		■		■			■		■			■	

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LI-2		<p>Renewable energy goals mandated. Maryland's State mandate to attain 20% renewable energy power sources has the potential to cause a variety of repercussions including vertical obstructions; radar and satellite communications issues; and interruption to NAS PAX mission critical activities.</p>														
		For other strategies that address this issue refer to Strategies ED-1A, ED-2A, ED-2B, ED-2C, ED-3A.														
LIGHT AND GLARE																
LG-1		<p>Light / glare from community development. Lighting controls and standards are not codified by all jurisdictions in the region. Existing standards do not address compatibility with operations (Night Vision Goggle training) that require dark sky conditions.</p>														
LG-1A	MCAOD	<p>Develop and establish Dark Sky Lighting ordinance. The jurisdictions within the NAS PAX Operating Areas should adopt "Dark Skies" ordinances that minimize urban sky glow and potential for light trespass onto adjacent properties. Specific development standards should be incorporated into zoning ordinances and building codes of each jurisdiction including areas adjacent to the installation boundary. The lighting ordinance should also include lighting regulation such as LED billboards in important flight paths and approach departure corridors.</p>	2018			■		■	■		■				□	

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NOISE AND VIBRATION																
NV-1		Lack of community noise regulations surrounding airfields and within areas designated for aircraft operations. Standards to address noise impacts from military operations near airfields do not exist in most jurisdictions. The standards that do exist require an update to noise standards in accordance with current noise level contour maps.														
NV-1A	Noise MCA	Incorporate noise contour maps into local planning documents. Use Navy-provided noise overlays and / or contour maps in County planning documents. Incorporate policies and guidelines that address noise impacts from aircraft operations and DOD compatibility guidelines as an appendix in these documents easily accessible by the public.	2016	■	■		■		■	■	■	■			<input type="checkbox"/>	
		For other strategy that addresses this issue refer to Strategy COM-2J.														
NV-2		Sensitive uses within noise contours. Sensitive land uses (residential and places of worship) are located within areas that experience increased noise (greater than 60 dB). The St. Mary's County AICUZ Overlay does not apply to areas around Webster Field.														
NV-2A	Noise MCA	Update St. Mary's County AICUZ Overlay. Amend the St. Mary's County AICUZ Overlay to include the Noise MCA at NAS PAX Main Station. Apply Noise MCA to Webster Field as part of recommended Webster Field AICUZ Overlay. Incorporate these into the zoning layer in online GIS.	2016						■						<input type="checkbox"/>	

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NV-3		<p>Residential development pressures in areas within noise contours. Increased noise levels up to 70 dB are experienced in the southern tip of Calvert County, which are the most densely populated areas of Calvert County and for which continued growth is anticipated.</p>															
NV-3A	Noise MCA	<p>Identify noise contours on county documents and in the decision-making process. Use Navy-provided noise overlays and / or contour maps in County planning documents to address existing and future operations that may result in noise and vibrations impacts to the community.</p>	2016	■												□	
NV-3B	Noise MCA	<p>Identify noise compatibility policies for inclusion in local planning documents. Incorporate policies and guidelines that address noise impacts from aircraft operations and DOD compatibility guidelines as an appendix to current planning documents that are easily accessible by the public.</p>	2016	■													
NV-3C	Noise MCA	<p>Amend building codes and zoning ordinance. Amend the building codes and zoning ordinance to require sound attenuation that achieves an interior noise level of 45 dB for any new buildings or significant changes or additions to current buildings located within areas identified as experiencing noise levels greater than 65 dBA LDN.</p>	2016	■													

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NV-4		Noise from jet holding pattern. The jet holding pattern creates excessive levels of noise in areas where sensitive uses are located.														
NV-4A	Noise MCA	Seek assistance from NAS PAX to incorporate maps and updates to planning documents and guidelines to minimize noise concerns among residents. Based on additional noise data and input from NAS PAX, consider revisions to communities' comprehensive plans to define areas that may be suitable for future real estate disclosure, sound attenuation or other measures to mitigate impacts from military operations.	2016	■					■						□	
NV-5		Occasional sonic boom from jets flying overhead. Sonic booms are problematic over shoreline communities. There are regular complaints called in to the NAS PAX hotline regarding sonic booms or noise from aircraft passing overhead. The Navy mitigates noise complaints through awareness notification and testing in ways to minimize complaints; however, increased noise complaints could compromise operations through pressure to modify or discontinue specific operations.														
		For strategies that address this issue refer to Strategies COM-2C, COM-2D, and COM-2L.														
NV-6		Noise and Vibration from Engines. Engine testing operations and low level flight cause noticeable vibrations and result in community complaints of sleep disturbance and property damage.														
NV-6A	General	Consolidate Information on Damage Claims Process. Preparation and development of a fact sheet on the damage claims process can be provided upon request to homeowners if they believe damage from vibration caused by aircraft activities has occurred.	2016												■	

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NV-6A (cont'd)		The fact sheet should include where to locate and submit claim forms, points of contact for the process, and what to expect during the claims review process.														
		See also Strategy COM-2K.														
ROADWAY CAPACITY																
RC-1		Congestion impedes safety / emergency access routes. Congestion on Route 2/4 affects traffic travelling from Calvert County into St. Mary's County. The Thomas Johnson Bridge is a vital link to the rest of the region and for accessibility to NAS PAX as well as an emergency egress route.														
RC-1A	Calvert County / St. Mary's County	Continue existing efforts and seek additional support to improve flow across Thomas Johnson Bridge. Continue coordination efforts with the MD DOT to improve traffic flow across the Thomas Johnson Bridge and affected major corridors to improve ingress/egress routes. Other partners: Calvert-St. Mary's MPO, MD DOT.	2016	■					■							□
RC-1B	Calvert County / St. Mary's County	Seek alternative funding sources for transportation improvements. Seek additional and alternative sources of funding for improvements to the Thomas Johnson Bridge project under the jurisdiction of the state of Maryland. Consider Public-Public or Public-Private (P4) funding sources. Other partners include: Calvert-St. Mary's MPO, MD DOT.	2016												□	■

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RC-2		Base Ingress/Egress. Route 235/Three Notch Road is at capacity due to high volumes approaching NAS PAX main station entry points. Additional development on- and off-base will likely lead to roadways and intersections with failing level of service.															
RC-2A	St. Mary's County	Conduct a traffic study to assess community impacts on NAS PAX and vice versa. Conduct an internal traffic study to quantify demand cycles and address alternatives such as repositioning or improvements to gate access to allow for alternative routes to NAS PAX. Other partner: Calvert-St. Mary's MPO.	2016	■					■						■	■	
RC-2B	St. Mary's County	Consider relocation main gate functions. Consider reopening Gate 3 to reduce traffic and congestion resulting from heavy use of Gates 1 and 2 and assist in supporting the economic vitality of the community. Other partners: Calvert-St. Mary's MPO, Tri-County Council of Southern Maryland.	2016												■	□	
RC-2C	St. Mary's County	Consider reopening Gate 3. Consider reopening Gate 3 to reduce traffic and congestion resulting from heavy use of Gates 1 and 2 and assist in supporting the economic vitality of the community. Other partner: Tri-County Council of Southern Maryland.	2016												■	□	

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RC-2D	St. Mary's County	Coordinate and budget for gate improvements that affect off-base roadway capacity and level of service. Identify, and budget for, necessary improvements to achieve AT / FP and more efficient functionality of egress / ingress points. Other partner: Calvert – St. Mary's MPO, Tri-County Council of Southern Maryland.	2016												■	<input type="checkbox"/>
RC-2E	MCAOD	Consider alternative modes of transportation to access NAS PAX Main Station. Consider providing alternative modes of transportation that provide drop off points within NAS PAX Main Station. Other partners: Calvert – St. Mary's MPO, Tri-County Council of Southern Maryland, State of Maryland	2016												■	<input type="checkbox"/>
		For other strategy that addresses this issue refer to Strategy COM-1E.														
SAFETY																
SA-1		Bird attractants near runway. Runway (14/32) extends from the Patuxent River to the shore of the Chesapeake Bay. Numerous bird attractants such as fishing and clamming nets are located near the piers in the bay. Bird activity in close proximity to the runway is an aviation safety hazard and increases the potential for bird aircraft strikes.														

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SA-1A	General	Reevaluate and update BASH Program. Update NAS PAX's BASH Program per the recently updated (January 2014) DOD Instruction with a focus on the elimination of wildlife attractants near runways and minimization of potential for accidents to occur.	2016												■		
SA-2		Webster Field Clear Zone extends off base. The Clear Zone associated with the runways at Webster Field extend off base to lands not owned by the Navy that are both currently developed and zoned for additional growth. Land development tools do not address land use compatibility around Webster Field.															
SA-2A	Safety MCA	Acquire all lands within Clear Zones. Seek funding from Congress to acquire sufficient real property interest to maintain Webster Field Clear Zones.	Ongoing													■	
SA-2B	Safety MCA	Consider strategic land exchange options. Explore strategic land exchanges on land (private, state, federal) within and proximate to Webster Field CZs and potential APZs.	Ongoing						■							■	
SA-3		No defined Accident Potential Zones associated with Webster Field Clear Zones. Due to the low number of fixed-wing operations at Webster Field, Accident Potential Zones (APZs) are not imposed beyond Webster Field's Clear Zones. Based on the Clear Zones extending off base, the APZs would also extend into the community where development of uses that are incompatible in safety zones is currently permitted.															
SA-3A	Safety MCA	Establish Webster Field safety zones. Pursue identification of additional safety zones (APZs I and II) around Webster Field.	Ongoing						■							■	

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SA-3B	Safety MCA	<p>Consider encroachment partnering agreements.</p> <p>Enter into encroachment partnering agreements with eligible entities under 10 U.S.C. §2684a to protect lands within the Webster Field APZs. This authority allows the Secretary of a military department to partner with another entity to acquire real property in the vicinity of, or ecologically related to, a military installation or military airspace, to limit encroachment or other constraints on military training, testing and operations. Eligible entities include a State and its subdivisions, and private entities that have, as their principal organizational purpose or goal, the conservation, restoration, or preservation of land and natural resources, or a similar purpose or goal.</p> <p>Other partners: Chesapeake Conservancy, and State of Maryland.</p>	Ongoing						■						■	<input type="checkbox"/>
SA-4		<p>Development within NAS PAX Main Station safety zones.</p> <p>Although no new residential development is permitted in the Clear Zone or Accident Potential Zones (APZ) associated with NAS PAX Main Station, residential uses are currently located in the safety zones. Residential areas are located to the southeast of the base in the Lexington Park, Southampton, Southgate Park, Cedar Cove, and Forest Park neighborhoods within or adjacent to APZ I and APZ II.</p>														
SA-4A	Safety MCA	<p>Incorporate Safety MCA into local planning documents.</p> <p>Incorporate the Safety Military Compatibility Area into local zoning codes and comprehensive plans by reference. The Safety MCA should address areas located within existing safety zones.</p>	Ongoing						■						<input type="checkbox"/>	

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SA-4C	Safety MCA	<p>Update zoning codes to address safety zones. Update and/or develop zoning codes to require residential uses and other uses that are proposed within safety zones to undergo a special approval process that includes Navy review. Uses that would require additional review include, but are not limited to, those that currently permit residential structures, churches, commercial day care, family day care facility, and other group care facilities.</p>	Ongoing						■						<input type="checkbox"/>	
SA-4D	Safety MCA	<p>Provide safety zone maps to local realtors and title companies. St. Mary's County should provide maps of the flight safety zones to local realtors and title companies. Maps should include a delineation of properties/areas that are, and may be in the future, subject to operational impacts associated with NAS PAX operations.</p>	Ongoing						■						<input type="checkbox"/>	

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VERTICAL OBSTRUCTIONS																
VO-1		Interference with low level flight activity. Development of wind turbines and cell towers are likely to create vertical obstruction issues, particularly for UAVs and low level aircrafts.														
VO-1A	Energy Dev MCA	Optimize use of towers. In order to reduce the number of towers needed in the future, providers should be encouraged to design new towers, structurally and electrically, to accommodate the applicant / licensee's antennas and comparable antennas for at least two additional users (minimum of three users for each tower structure), unless this design would require the addition of lights or guy wires to an otherwise unlighted and / or unguyed tower. Other partner: Somerset County.	2018	■	■	■	■	■	■	■		■				■
VO-1B	General	Identify and map specific areas of concern related to tall structures. Develop a "Red, Yellow, Green" (RYG) Map identifying locations throughout the NAS PAX Operating Area where tall structures (with defined heights) should be prohibited to protect public safety and ensure compatibility. Other partner: Somerset County.	2018	■	■	■	■	■	■	■	■	■			□	■

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VO-1C	General	<p>Include NAS PAX on tower siting and approval process.</p> <p>Establish partnerships between each jurisdiction and NAS PAX to allow for Navy review or comment on any proposed communications towers. Local jurisdictions should seek to leverage NAS PAX's modeling capabilities to identify proper locations of proposed towers.</p> <p>Other partner: Somerset County.</p>	2018	■	■	■	■	■	■	■	■	■			<input type="checkbox"/>	■
VO-1D	Vertical Obstruction MCA	<p>Incorporate Vertical Obstruction MCA into local planning documents.</p> <p>Adopt and implement height guidance in the Vertical Obstruction MCA that encompasses areas within existing Inner Horizontal Surfaces and Approach-Departure Clearance Surfaces for active runways and an additional one half nautical mile beyond these boundaries. Establish height limitations for all proposed structures within the Vertical Obstruction MCA.</p>	2018	■					■						<input type="checkbox"/>	

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VO-2		Airfield Protection. Tall structures in proximity to the airfield have the potential to interfere with the safe operation of the airfield.														
VO-2A	General	Establish height limits within the overall NAS PAX Operating Area. With technical assistance provided by the Navy, amend zoning ordinances for appropriate height restrictions in flight corridors based on AICUZ, RAICUZ, radar viewshed and HRAIZ concerns. Other partner: Somerset County.	2016	■	■	■	■	■	■	■	■	■			□	■
VO-2B	General	Enhance coordination of FAA permitting process. Coordinate with the FAA about permitting of cell towers that exceed 200 feet and trigger required approvals. Provide this guidance in local planning documents or made available online from each jurisdiction's website in an easy to access location and easy to understand format. Other Partner: Federal Aviation Agency.	2016	■	■	■	■	■		■	■	■				□
VO-2C	General	Create a cell tower siting awareness program. Develop a brochure which provides information about best practices for cell tower siting to telecommunications companies and local jurisdictions. Include instructions for coordinating with affected jurisdictions and NAS PAX when considering the placement of cell towers. Other partner: Somerset County.	2016	■	■	■	■	■	■	■	■	■			□	■

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VO-2D	Vertical Obstruction MCA	<p>Develop a 3-dimensional imaginary surfaces model for use by regional airports and local jurisdictions.</p> <p>Develop a 3D modeling of existing height regulations compared to allowable heights based on the DOD imaginary surfaces of airfields. The purpose of this tool is to assist the jurisdictions in understanding the imaginary surfaces, to make appropriate amendments to ordinances, and enhance military compatibility.</p> <p>Other partner: Tri-County Council for Southern Maryland.</p>	2016	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input checked="" type="checkbox"/>
WATER QUALITY / QUANTITY																
WQ-1		<p>Salt Water Intrusion.</p> <p>Water quality / quantity concerns include the assurance that adequate water supplies of good quality are available for use by the installation and surrounding communities as the area develops. Water supply for agriculture and industrial use is also considered.</p>														
WQ-1A	General	<p>Continue to monitor groundwater levels.</p> <p>Continue to monitor aquifers patterns of water quality and recharge associated with salt water intrusion. Benchmark water usage rates against changes in aquifer levels as part of an ongoing awareness strategy.</p> <p>Other partners: USGS, Maryland Geologic Survey, Maryland Department of the Environment.</p>	Ongoing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

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