

1 Introduction



Naval Air Station Patuxent River, Patuxent River, Maryland

The goal of the AICUZ Program is to protect military operational capabilities and the health, safety, and welfare of the public by achieving compatible land-use patterns and activities in the vicinity of a military installation.

In many locations throughout the United States the military's presence is expanding both in terms of physical size and mission growth. Many areas have also experienced associated population growth and increased development close to a military installation. This growth is evident immediately outside many station fence lines as well as throughout the surrounding areas. This growth typically takes the form of residential and commercial development. New homes are constructed close to an installation to allow both military and civilian personnel who work at a base to live near their employer. Similarly, businesses are established near these homes and the military installation to support the installation and its personnel. Because of its proximity to the installation, some of this development is incompatible with aircraft operations and other military operations that occur at the base and, over time, can result in nearby residents being adversely impacted. This can also result in the degradation of the installation's mission.

The United States Department of Defense (DoD) initiated the Air Installations Compatible Use Zones (AICUZ) Program to help government entities and communities anticipate, identify, and promote compatible land use and development near military installations. The goal of this program is to both protect military operational capabilities and to protect the health, safety, and welfare of the public by achieving compatible land-use patterns and activities in the vicinity of a military installation. The AICUZ Program recommends community land uses that are compatible with noise levels, accident potential, and flight clearance requirements associated with military airfield operations so that the information can be incorporated into local community planning programs.

This AICUZ Study has been prepared for Naval Air Station (NAS) Patuxent River, Patuxent River, Maryland. NAS Patuxent River is part of the Patuxent River Complex, which includes Webster Field (NAS Patuxent River's outlying landing field [OLF] located in St. Inigoes Shores, Maryland) and the Atlantic Test Range (ATR) Inner Range.

The original AICUZ Program for NAS Patuxent River was completed in 1979 (Naval Facilities Engineering Command Chesapeake Division 1979). An aircraft noise study also was conducted for NAS Patuxent River in conjunction with an *Environmental Impact Statement for Increased Flight and Related Operations in the Patuxent River Complex* (Naval Air Warfare Center Aircraft Division 1998). The EIS was finalized in December 1998. Aircraft operations associated with EIS Workload Alternative III were selected to represent the preferred alternative for that EIS. Given NAS Patuxent River's research and testing mission, adoption and implementation of an alternative that provides maximum flexibility with respect to aircraft operational data was needed at NAS Patuxent River to "accept new workloads if and when required." Operational data associated with Alternative III, in part, serve as the framework for this AICUZ Study.

In addition to incorporating the info from the 1998 EIS, this AICUZ Study also incorporates aircraft operations data from the F-35 aircraft provided in part by the *Environmental Assessment/Overseas Environmental Assessment, Joint Strike Fighter System Development and Demonstration Developmental Test Program* (U.S. Department of the Navy August 2006). Information for the analysis was also provided by staff at the NAS Patuxent River Joint Strike Fighter (JSF) Integrated Test Force Office. These data have been supplemented with current JSF data, further measurement data gathered at Edwards Air Force Base (AFB) and provided by the Air Force, and assumptions provided in the Draft EIS for *Proposed Implementation of the Base Realignment and Closure (BRAC) 2005 Decisions and Related Actions at Eglin AFB, FL* (U.S. Air Force 2005). This 2009 AICUZ Study is an update of the 1979 study and is part of the United States Navy's (Navy) participation in the local

community planning process. This study has been prepared in consideration of both past and expected changes in mission, aircraft, and projected operational levels that are expected to occur within the next four- to five-year planning period.

This study provides background information on the Navy's AICUZ program (Section 1) and describes the NAS Patuxent River installation's mission, operational areas, and socioeconomic impact on the surrounding region (Section 2). Section 3 discusses current aircraft operations and airspace at NAS Patuxent River. Section 4 presents the existing and projected aircraft noise zones for NAS Patuxent River and describes how noise zones are determined, the changes that have occurred, and the measures that have been implemented by the Navy in response to noise complaints. Section 5 discusses aircraft safety issues, including changes in the accident potential zones (APZs) and pilot safety. Section 6 evaluates the compatibility of surrounding land uses with aircraft operations, and Section 7 provides the Navy's recommendations for promoting land-use compatibility consistent with the goals of the AICUZ Program for the NAS Patuxent River region.

1.1 AICUZ Program

In the early 1970s, the DoD established the AICUZ Program to balance the need for aircraft operations with community concerns about aircraft noise and accident potential. The AICUZ Program was developed in response to growing incompatible urban development (encroachment) around military airfields. The goals of the AICUZ Program are to:

- Protect the health, safety, and welfare of those living and working near military fields; and
- Preserve the military flying mission.

To meet these goals, the Navy has identified the following actions, components, and requirements for a successful AICUZ Program:

Encroachment

Encroachment is defined primarily as any non-Navy action planned or executed which inhibits, curtails, or possesses the potential to impede the performance of Navy activities.

- Develop and periodically update a study and map for each air installation to quantify and depict aircraft noise zones and APZs;
- Coordinate with federal, state, and local officials to encourage compatible land-use development around each air installation;
- Inform the local communities of the importance of maintaining the Navy’s ability to conduct aircraft operations; and
- Review operations and implement operational changes and noise abatement strategies to minimize noise impacts while ensuring mission requirements.

Under the AICUZ Program, the DoD identifies noise zones and APZs as planning tools for local planning agencies. The Federal Aviation Administration (FAA) and the DoD also encourage local communities to restrict development or land uses that could endanger aircraft in the vicinity of the airfield, including lighting (direct or reflected) that would impair pilot vision; towers, tall structures, and vegetation that penetrate navigable airspace or are constructed near the airfield; uses that generate smoke, steam, or dust; uses that attract birds, especially waterfowl; and electromagnetic interference with aircraft communication, navigation, or other electrical systems.

1.2 Purpose, Scope, and Authority

The purpose of the AICUZ Program is to achieve compatibility between air installations and neighboring communities. To satisfy the purpose of the AICUZ Program, the military installation works with the local community to discourage incompatible development of land adjacent to the installation. As development encroaches upon the airfield, more people experience the noise and accident potential associated with aircraft operations.

The scope of the AICUZ Study includes a detailed analysis and quantification of the following:

- Aircraft noise and accident potential;
- Land-use compatibility;

An AICUZ Study analyzes community development trends, land-use planning tools, and mission requirements to develop a recommended strategy for communities to prevent incompatible land development adjacent to an installation.

- Operational alternatives;
- Noise-reduction strategies; and
- Potential solutions to existing and potential incompatible land-uses.

The AICUZ Study analyzes community development trends, land-uses, and mission requirements at the airfield to develop a recommended strategy for communities in order to prevent incompatible land development adjacent to the installation. AICUZ considerations are based on the impacts of noise, the safety considerations of aircraft accidents, and economic considerations relating to public funds and local economic viability. AICUZ guidelines are implemented by the air installation commander through cooperation with the local governments to protect the installation's mission requirements and, at the same time, protect and promote the public's health, safety, and welfare. The authority for the establishment and implementation of the NAS Patuxent River AICUZ Program is derived from:

- United States Department of Defense Instruction 4165.57, "Air Installations Compatible Use Zones" (November 8, 1977)
- Chief of Naval Operations Instruction and Office of Naval Operations Instruction (OPNAVINST) 11010.36C, "Air Installations Compatible Use Zones Program" (October 9, 2008)
- Naval Facilities Instruction P-971, "Airfield and Helicopter Planning and Design" (May 1, 1999)
- Unified Facilities Criteria (UFC) Airfield and Heliport Planning and Design (November 200),
- United States Department of Transportation, FAA Regulations, Code of Federal Regulations, Title 14, Part 77, "Objects Affecting Navigable Airspace."

1.3 Responsibility for Compatible Land Use

Ensuring land use compatibility within the AICUZ is the responsibility of many, including the DoD, local planning and zoning agencies, real estate agencies, residents, developers, and builders. Military installations and local government agencies with planning and zoning authority share the responsibility for preserving land use compatibility near the military installation. Cooperative action by all parties is essential to prevent land use incompatibility and hazards from neighboring communities. Table 1-1 identifies some responsibilities for various community stakeholders residing in proximity to an installation. (These responsibilities are elaborated in Section 8.)

Table 1-1
Responsibility for Compatible Land Uses

Navy	<ul style="list-style-type: none"> ▪ Examine air mission for operation changes that could reduce impacts. ▪ Conduct noise and APZ studies. ▪ Develop AICUZ maps. ▪ Examine local land uses and growth trends. ▪ Make land-use recommendations. ▪ Release an AICUZ Study. ▪ Work with local governments and private citizens. ▪ Monitor operations and noise complaints. ▪ Update AICUZ plans, as required.
Local Government	<ul style="list-style-type: none"> ▪ Incorporate AICUZ guidelines into a comprehensive development plan and zoning ordinance. ▪ Regulate height and obstruction concerns through an airport ordinance. ▪ Regulate acoustical treatment in new construction. ▪ Require fair disclosure in real estate for all buyers, renters, lessees, and developers.
Private Citizens	<ul style="list-style-type: none"> ▪ Educate oneself on the importance of the Installation's AICUZ Program. ▪ Identify AICUZ considerations in all property transactions. ▪ Understand AICUZ effects before buying, renting, leasing, or developing property.
Real Estate Professionals	<ul style="list-style-type: none"> ▪ Ensure potential buyers and lessees receive and understand AICUZ information on affected properties. ▪ When working with builder/developers, ensure an understanding and evaluation of the AICUZ Program.
Builders/Developers	<ul style="list-style-type: none"> ▪ Develop properties in a manner that appropriately protects the health, safety, and welfare of the civilian population by constructing facilities which are compatible with aircraft operations (e.g., sound attenuation features, densities, and occupations).
<p>Key: AICUZ = Air Installations Compatible Use Zones. APZ = Accident Potential Zone.</p>	

1.4 Previous AICUZ Efforts and Studies

The original AICUZ for NAS Patuxent River was prepared and approved in 1976 and updated and approved again three years later in 1979. In addition, an AICUZ for OLF Webster Field was prepared in 2006 as an update to the 1979 AICUZ.

Several noise studies have been conducted since the 1979 AICUZ update. In 1994 an Aircraft Noise Survey for NAS Patuxent River was conducted. The noise study identified noise exposure levels at that time, but the AICUZ Study was not updated due to uncertainties associated with potential base realignments.

In 1999 an Aircraft Noise Study was conducted for the Patuxent River Complex, which included both NAS Patuxent River and Webster Field (Wyle Laboratories 1999). The noise study was prepared as a component of the *Environmental Impact Statement (EIS) for Increased Flight and Related Operations in the Patuxent River Complex (Naval Air Warfare Center, Aircraft Division 1998)*, previously discussed.

1.5 Changes that Require an AICUZ Update

AICUZ studies are updated when an air installation's AICUZ is considered outdated. Determining whether an AICUZ is outdated is based primarily on the following factors:

- Significant changes that have occurred in aircraft operations (i.e., the number of takeoffs and landings);
- Significant changes in the type of aircraft stationed and operating at an installation; or
- Significant changes that have occurred in flight paths or procedures.

The previous AICUZ studies prepared for NAS Patuxent River were in 1976 and 1979. Since 1979, significant changes occurred at the facility in terms of all three items listed above. Therefore, in accordance with Chief of Naval Operations Instruction (OPNAVINST) 11010.36C,

this AICUZ has been prepared to reflect changes in airfield operations since the last AICUZ update and to incorporate any reasonable projected mission changes.

1.5.1 Changes in Operations Level

Over time, the operational tempo at NAS Patuxent River has fluctuated.

Planned flight operations of 91,546 operations are used as the basis for this AICUZ.

Over time, the operational tempo at NAS Patuxent River has fluctuated (see Table 1-2). In the late 1970s, the AICUZ for NAS Patuxent River reported annual operations for the facility at 159,080 total operations. Although another AICUZ has not been prepared and adopted for Patuxent River since 1976, operations through the 1980s and 1990s have dropped from the historic high in 1979. In 1999, a low of 63,876 total operations were reported. Based on planned flight operations for 2009, 91,546 annual operations are used as the basis for this AICUZ because this was the number of operations projected in Alternative III of the 1998 EIS.

Table 1-2
Yearly Comparison of Operations at NAS Patuxent

Year	Navy/Marine Corps	Other Military	TOTAL
1979	N/A	N/A	159,080
1980 to 1993	N/A	N/A	N/A
1994	74,150	6,747	80,897
1995	79,556	7,185	86,741
1996	74,213	6,643	80,856
1996	N/A	N/A	N/A
1997	77,632	3,315	80,947
1998	78,250	2,474	80,724
1999	62,251	1,625	63,876
2000	66,369	1,937	68,306
2001	N/A	N/A	72,435
2002	N/A	N/A	67,325
2003	N/A	N/A	57,184
2004	N/A	N/A	42,466
2005	N/A	N/A	61,688
2006	N/A	N/A	52,626
2007	N/A	N/A	52,189
2008	N/A	N/A	N/A
2009*	N/A	N/A	91,546
ALT III* ¹	N/A	N/A	94,332

* Projections

¹ Alt III refers to Workload Alternative III identified in the *Environmental Impact Statement for Increased Flight and Related Operations in the Patuxent River Complex*

Sources:

Annual Air Activity Reports for NAS Patuxent River 1994-2008,
Wyle Laboratories 1999.

1.5.2 Changes in Aircraft Mix

NAS Patuxent River is used for a variety of military testing and training purposes. Activities include both rotary-wing and fixed-wing operations. A discussion of the past and current aircraft types that have supported the mission at NAS Patuxent River are provided below.

1.5.2.1 Past Aircraft Types

Since the 1940s, flight test operations have been performed at NAS Patuxent River. In addition to test operations, fleet operational squadrons have also been stationed on base. Aircraft located at NAS Patuxent River have changed over the years along with organizational structures. At the time of the first AICUZ Study in 1976, NAS Patuxent River was a field activity of the Naval Air Systems Command (NAVAIR) Test Directorates and housed the following six Test Directorates:

- Strike Aircraft Test Directorate
- Anti-Submarine Aircraft Test Directorate
- Rotary Wing Aircraft Test Directorate
- Systems Engineering Test Directorate
- Technical Support Test Directorate
- U.S. Naval Test Pilot School

NAVAIR aircraft at NAS Patuxent River in the late 1970s consisted of a fleet of approximately 140 fixed-wing and rotary-wing aircraft. These aircraft are listed in Table 1-3.

In addition to the six NAVAIR Test Directorates listed above, there were four fleet squadrons and a Naval Research Laboratory (NRL) flight detachment located at the station in 1976:

- Fleet Air Reconnaissance Squadron Four, C-130;
- Oceanographic Development Squadron Eight, P-3;

- Reserve Patrol Squadron Sixty Eight, part of the Fleet Air Reserve Wing Atlantic, P-3;
- Air Test and Evaluation Squadron One - P-3, S-3, H24, and H3; and
- NRL Flight Detachment; C-121 and P-3.

See Table 1-3 for a comparison of aircraft usage at NAS Patuxent River since 1979.

Table 1-3
Aircraft Types at NAS Patuxent River/Webster Field
in 1979 and 2008

Aircraft Type	1979	2008
Fixed Wing		
A-3	6	0
A-4	11	0
A-6	6	0
A-7	12	0
AV-8	3	0
B-707	0	0
C-1	4	0
C-2	0	2
C-12	0	7
C-121	1	0
C-130	4	5
C-135	0	0
E-2	1	3
E-6	0	1
EA-18	0	2
EA-6	0	3
F-14	5	0
F/A-18	11	32
F-4	5	0
OV-1	3	0
NU-1	0	1
NP-3	0	3
P-3	22	4
S-3	6	0
T-2	8	1
T-6	0	7
T-34	0	1
T-38	5	10
T-39	1	0
T-45	0	3
U-6	0	2
X-26	0	2
Rotary Wing		
H-1	9	5
H-2	6	0
H-3	6	3
H-46	3	0
H-53	4	2

Table 1-3
Aircraft Types at NAS Patuxent River/Webster Field
in 1979 and 2008

Aircraft Type	1979	2008
H-57	0	2
OH-58	0	4
TH-6B	0	3
H-60	0	7
Tilt Rotor		
V-22	0	4
Unmanned Aerial Vehicles (UAVs)		
Representative UAVs include RQ-2,4,7,8A/B, Silver Fox, etc.	0	103
TOTAL	142	222
Source: NAS Patuxent River 2008.		

1.5.2.2 Present Aircraft Types

Today, NAVAIR is a tenant headquartered at NAS Patuxent River and is an integral part of what is referred to as the Naval Aviation Systems TEAM. The TEAM's unique mission is to serve the Navy and the nation by developing, acquiring, and supporting aircraft and related systems that can be operated and sustained at sea. The Test and Evaluation (T&E) Group of the Naval Aviation Systems TEAM and Naval Air Warfare Center Aircraft Division (NAWCAD) includes Naval Test Wing Atlantic and comprises the following four squadrons located at NAS Patuxent River:

- Naval Force Aircraft Test Squadron
- Naval Rotary Wing Aircraft Test Squadron
- Naval Strike Aircraft Test Squadron
- Naval Test Pilot School Squadron

The Naval Force Aircraft Test Squadron was commissioned to safely provide assets and services in support of program teams, the fleet, and other customers associated with research, development, and current test and evaluation of P-3, S-3, E-2, C-130, T-2, C-2, T-34, C-12, and E-6 aircraft and mission systems.

The Naval Rotary Wing Aircraft Test Squadron performs technical test and evaluations on rotorcraft and their systems for their intended missions. The squadron comprises of military, civil service,

and contractor employees and presently operates and maintains H-1, H-3, H-53, H-57, H-58, and H-60 series aircraft. In addition, the squadron tests the V-22 aircraft.

The Naval Strike Aircraft Test Squadron supports the research, test, and evaluation of fixed-wing tactical aircraft by providing aircraft and pilot assets, maintenance services, safety oversight, and facility support efforts. Squadron aircraft include the F-18, T-45, and X-31 aircraft. The squadron has hosted flight demonstrations for the Joint Strike Fighter. It should be noted that Remote Operating Area (ROA) operations are located at Webster OLF. The Fleet Composite Six Unmanned Aerial Vehicles (UAV) Detachment also operates ROAs at Webster OLF.

The U.S. Naval Test Pilot School provides both fixed-wing and rotary-wing instruction to experienced pilots, flight officers, and engineers in the process of and techniques of aircraft and systems test and evaluation. The school maintains and operates about 50 aircraft of several types, including the fixed wing T-2, T-38, F-18, C-12, P-3, and X-26 and rotary wing H-58 and H-60.

Other tenant organizations maintaining aircraft at NAS Patuxent River include Air Test and Evaluation Squadron One (VX-1), Fleet Air Reconnaissance Squadron Four Detachment (VQ-4), and NRL Flight Support Detachment. VX-1 conducts operational testing and tactics development for aircraft weapons systems, support systems, and equipment supporting the missions of undersea warfare, anti-surface warfare, and special missions. The squadron maintains and operates P-3, H-3, and H-60 aircraft. The NRL Flight Support Detachment operates modified P-3 aircraft to provide airborne support for scientific research projects undertaken. VQ-4 is a detachment of the squadron based at Tinker Air Force Base, Oklahoma. At Webster Field, the Army Reserve is now the primary UAV operator, flying the RQ-7 Shadow UAV.

Base organizations operating and maintaining aircraft include the NAS Patuxent River Air Operations and NAS Patuxent River Flying Club. According to information collected from NAS Patuxent River, the

total aircraft loading for NAS Patuxent River is 222 aircraft (see Table 1-3).

1.5.2.3 Comparison of Aircraft Types

Table 1-3 provides more detailed aircraft loading information by providing loading by specific type of aircraft in 1979 and 2008. Notable changes reflected in the table include the elimination of A-series aircraft and the addition of the F-18. It is also notable that although they are counted in terms of planned flight operations, there are no F-35 aircraft currently stationed at NAS Patuxent River. F-35 aircraft will not begin arriving at NAS Patuxent River until 2009. In terms of total aircraft loading the numbers have risen, increasing from 142 aircraft to 222 aircraft over the 30-plus year stretch.

1.5.3 Changes in Flight Tracks and Procedures

There have been no notable changes that have occurred in flight tracks or procedures for NAS Patuxent River in recent years. Historic modifications to flight operation procedures associated with noise abatement are discussed in Section 4.4, Noise Abatement/Flight Procedures. See Section 3.4.2 for specific flight tracks flown at NAS Patuxent River. Flight tracks are provided for all fixed-wing and rotary aircraft as well as a separate set of flight tracks for the F-35 aircraft.