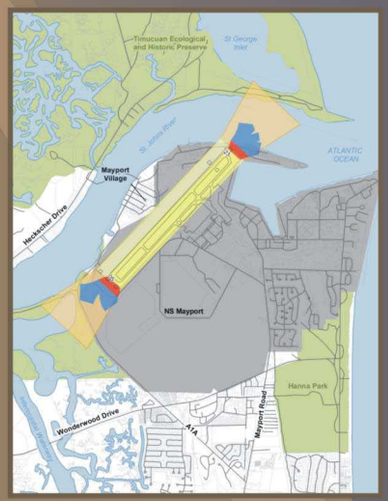

Final

Air Installations Compatible Use Zones Report for

NAVAL STATION MAYPORT JACKSONVILLE, FLORIDA

June 2007

Prepared by:
UNITED STATES DEPARTMENT OF THE NAVY
Naval Facilities Engineering Command Southeast
Jacksonville, Florida

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Acronyms and Abbreviations

AAD	average annual day
AGL	above ground level
AICUZ	Air Installations Compatible Use Zones
APZ	accident potential zone
ATC	air traffic control
BASH	bird/animal aircraft strike hazard
CFR	Code of Federal Regulations
COMHELMARSTRKWINGLANT	Helicopter Maritime Strike Wing, Atlantic
CY	calendar year
dBA	decibels (A-weighted)
DNL	day-night average sound level (sometimes called Ldn)
DoD	United States Department of Defense
DoDINST	United States Department of Defense Instruction
DST	Daylight Savings Time
EIS	environmental impact statement
EMI	electromagnetic interference
FAA	Federal Aviation Administration
FCLP	Field Carrier Landing Practice
FLUCC	Florida Land Use Classification Code
GCA	ground-controlled approach
GIS	Geographic Information Systems
GSA	Government Services Administration
GSI	glide slope indicator
HSL	Helicopter Anti-Submarine Light Wing
HUD	Housing and Urban Development
NAVFAC	Naval Facilities Engineering Command
Navy	United States Department of the Navy
NS Mayport	Naval Station Mayport
OPNAVINST	Office of Naval Operations Instruction

Acronyms and Abbreviations, *continued*

RNM	Rotorcraft Noise Model
SH-60 or H-60	Seahawk helicopter
SLUCM	Standard Land Use Coding Manual
SR	State Route
TACAN	tactical air navigation
TDR	Transfer of Development Rights
UFC	Unified Facilities Criteria
VFR	visual flight rules

1 Introduction

All airports attract development. Housing is constructed for airport employees who want to live nearby, and businesses are established to cater to the airport. As development encroaches upon the airfield, more people are exposed to the noise and accident potential associated with aircraft operations. The goal of the United States Department of Defense's (DoD's) Air Installations Compatible Use Zones (AICUZ) Program is to protect the health, safety, and welfare of those living near a military airfield while preserving the defense flying mission. The AICUZ Program recommends land uses that are compatible with noise levels, accident potential, and flight clearance requirements associated with military airfield operations.

DoD
United States Department of Defense

AICUZ
Air Installations Compatible Use Zones

NS Mayport
Naval Station Mayport

Navy
United States Department of the Navy

This AICUZ report has been prepared for Naval Station Mayport (NS Mayport), Mayport, Florida (also referred to in this report as the Installation, the Air Installation, and the Station). Preparation and presentation of this update to NS Mayport's AICUZ study is part of the United States Department of the Navy's (Navy's) continuing participation in the local planning process. As local communities prepare land use plans and zoning ordinances, the Navy has the responsibility to provide input on its activities relating to the community. This study is presented in the spirit of mutual cooperation and assistance by NS Mayport to aid in the local land use planning process. This study updates information on base flying activities since the 1993 AICUZ study, and

APZ
accident potential zone

provides noise contours and accident potential zones (APZs) based on projected flying activities through 2008. The noise contours and APZs presented in this study are based on actual 2003 flight operations conducted at NS Mayport. Section 1 of this AICUZ report provides background on the AICUZ Program. Section 2 describes the Air Installation, its tenants and operations. Section 3 discusses current airspace and aircraft operations at the Installation. Section 4 presents information on aircraft noise zones – how noise zones are determined, what changes have occurred, and what measures have been implemented by the Navy in response to noise complaints. Section 5 discusses aircraft safety issues. Section 6 evaluates the compatibility of surrounding land uses with aircraft operations. Section 7 outlines tools for implementing the AICUZ Program and provides the Navy recommendations for promoting land use compatibility consistent with the goals of the AICUZ Program.

1.1 AICUZ Program

In the early 1970s, the DoD established the AICUZ Program to balance the need for aircraft operations and community concerns over 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
- To preserve the military flying mission.

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

- 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 the Air Installation;

- Inform the local community of the importance of maintaining the Navy's ability to conduct aircraft operations; and
- Review operations and implement operational changes and noise abatement strategies that would minimize noise impacts while ensuring mission requirements.

Under the AICUZ Program, DoD identifies noise zones and APZs as planning tools for local planning agencies. The Federal Aviation Administration (FAA) and 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 (EMI) with aircraft communication, navigation, or other electrical systems.

FAA
Federal Aviation Administration

EMI
electromagnetic interference

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, local commands work with nearby communities to prevent incompatible development of land adjacent to the air station. 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:

- Aircraft noise and accident potential;
- Land use compatibility;
- Operational alternatives;
- Noise reduction strategies; and
- Potential solutions to existing and potential incompatible land use problems.

The update to the NS Mayport AICUZ study will utilize an analysis of community development trends and mission requirements to develop a strategy that prevents 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 related to public funds and local economic viability. The basis for implementing AICUZ guidelines lies in the Station Command's 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 NS Mayport AICUZ Program is derived from:

DoDINST
United States Department of Defense Instruction

OPNAVINST
Chief of Naval Operations Instruction

UFC
Unified Facilities Criteria

CFR
Code of Federal Regulations

- United States Department of Defense Instruction (DoDINST) 4165.57, "Air Installations Compatible Use Zones," dated November 8, 1977;
- Chief of Naval Operations Instruction (OPNAVINST) 11010.36B, "Air Installations Compatible Use Zones Program," dated December 19, 2002;
- UFC 3-260-01, "Unified Facilities Criteria, Airfield and Heliport Planning and Design," dated November 1, 2001; and
- United States Department of Transportation, FAA Regulations, Code of Federal Regulations (CFR), 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 DoD, local planning and zoning agencies, real estate professionals, 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 encroachment. Table 1-1 identifies entity responsibilities.

Table 1-1 Responsibility for Compatible Land Uses	
Navy	Continue to examine air mission for operation changes that could reduce impacts. Conduct noise and APZ studies. Develop AICUZ maps. Examine local land uses. Make land use recommendations. Release an AICUZ Report. Work with local governments and private citizens. Monitor operations and noise complaints. Update AICUZ, as warranted.
Local Government	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, and lessees.
Private Citizens	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	Ensure that 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	Develop properties in a manner to protect the health, safety and welfare of the civilian population by constructing land use facilities which are compatible with aircraft operations (e.g., sound attenuation features).
Key: AICUZ = Air Installations Compatible Use Zones. APZ = Accident potential zone. Navy = United States Department of the Navy.	

1.4 Changes That Require an AICUZ Update

Engine Run-Ups
aircraft engine test at maximum power for maintenance or prior to take-of of an aircraft

Aircraft noise consists of two major sound sources: flight operations and ground engine maintenance "run-ups," which are associated with pre-flight and maintenance checks. The level of noise exposure relates to a number of variables, including the aircraft type, engine power setting, altitude, flight track, temperature, relative humidity, frequency, and time of operations. Generally, these factors fluctuate from year to year. Small fluctuations in the annual number of operations will not have a significant effect on community noise exposure.

AICUZ reports should be updated when an air installation has a significant change in aircraft operations (i.e., number of takeoffs and landings), a change in the type of aircraft stationed and operating at the installation, or a significant change in flight paths or procedures.

This AICUZ study has been prepared in accordance with the Navy's latest AICUZ guidance, in consideration of expected changes in mission, aircraft, operational levels, etc., that can reasonably be projected. This update to the NS Mayport AICUZ report is needed due to changes in the percentage of the predominantly fixed-wing transient aircraft operations. This AICUZ Report supersedes information on base flying activities since the 1994 Noise Update for NAS Mayport. For aircraft stationed at NS Mayport, no significant change in operational activities, outside those activities addressed in this AICUZ update, are expected. Although no significant aircraft operations changes are expected, future aircraft in the Navy and Navy fleet may include another version of the current Seahawk helicopters operating at NS Mayport. However, this aircraft is not yet in the current NS Mayport aircraft inventory.

2 Naval Station Mayport

2.1 Location

NS Mayport is located on the northern coast of Florida at the mouth of the St. Johns River, approximately 15 miles east of the city of Jacksonville in Duval County. Figure 2-1 depicts the regional setting of Mayport. Its surrounding area is mostly residential, with an area of commercial activity around the fishing village of Mayport. Atlantic Beach, Neptune Beach, Jacksonville Beach, and Ponte Vedra Beach are all populated communities just south of the Installation. Figure 2-2 shows the airfield location and its immediate vicinity. As illustrated, the Installation is surrounded by a large body of water, with the Atlantic Ocean on the east and St. John's River to the north and west. The runway is located on the northwest quadrant of NS Mayport property.

The only aircraft permanently based at NS Mayport is the **Seahawk (SH)-60 helicopter**. All other aircraft types using the Station do so on a visitor basis.

NS Mayport is one of two major Navy air installations in the Jacksonville area. The only aircraft permanently based at NS Mayport is the SH-60 helicopter. All other aircraft types using the Station do so on a visitor basis. Aircraft activity at NS Mayport comprises both rotary-wing and fixed-wing operations. Rotary-wing aircraft (i.e., helicopters) are the main users of the airfield in terms of total operations with such activity as arrivals, departures, patterns, and run-up operations, including maintenance test cell operations for the five active and one reserve based SH-60 squadrons. The SH-60 is the dominant aircraft in terms of flight operations at NS Mayport. All fixed-wing aircraft operations at the Installation are conducted by transient aircraft. The C-12 and other aircraft account for the majority of the transient operations at NS Mayport. In addition to C-12 operations, other fixed-wing activity at

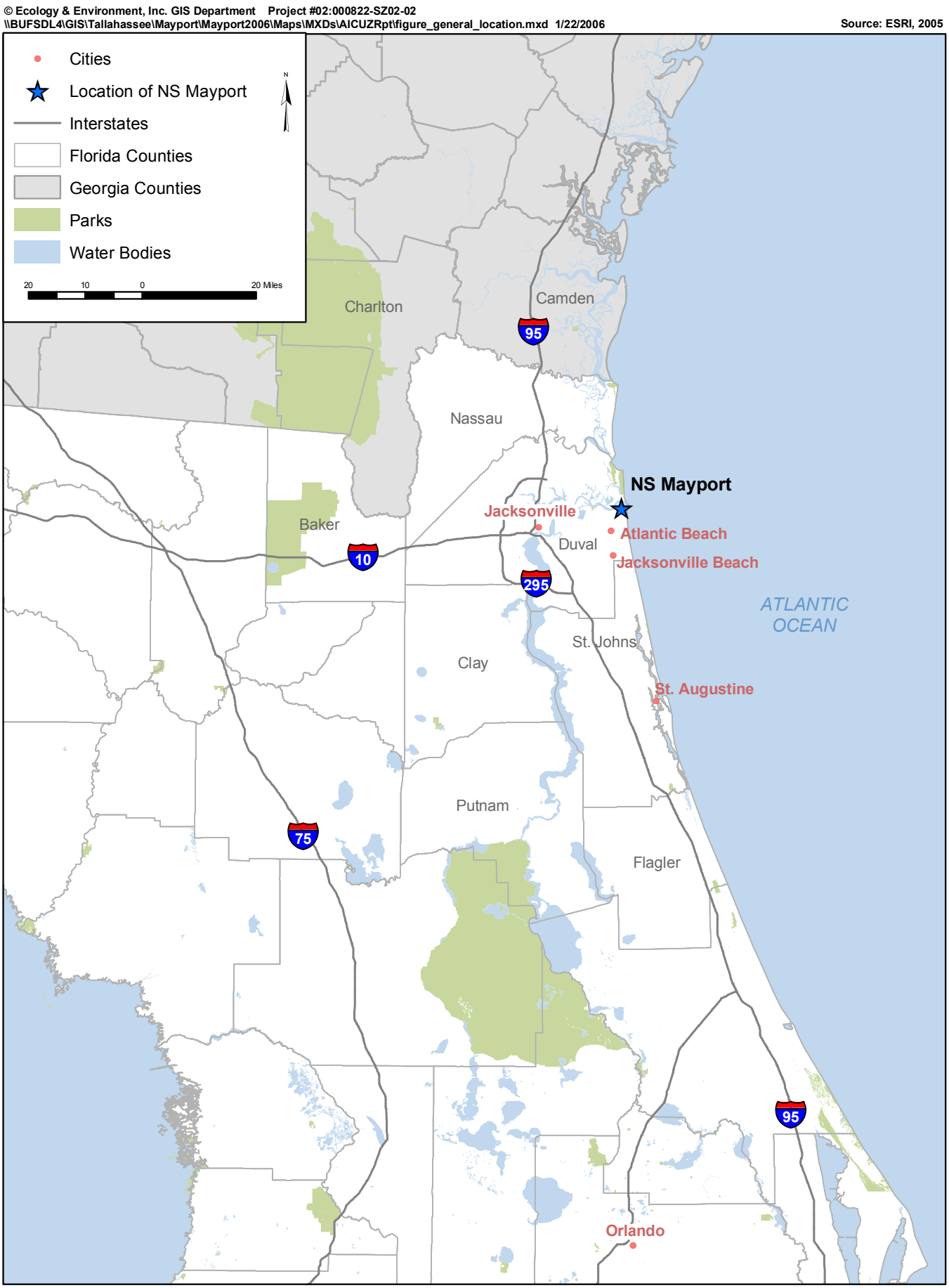

Figure 2-1
General Location Map, NS Mayport
Mayport, Florida

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Source: ESRI, 2005; NS Mayport, 2005

Figure 2-2
Airfield Location and Vicinity
NS Mayport

the Installation includes transient operations by F/A-18, C-12, T-45, F-15 and other aircraft at the time of the noise study. However, the mix of transient aircraft is constantly evolving.

2.1.1 Mission

Mission
The mission of NS Mayport is to enhance warfighter operational readiness through superior logistical support to the fleet and a demonstrated commitment to the welfare of war fighters and their families. During mobilization, NS Mayport provides support to all deploying personnel.

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2.1.2 Tenant Commands

Current flight tenant activities and tenant aircraft at NS Mayport are:

HSL
Helicopter Anti-Submarine Light Wing – Helicopter Squadron

- Helicopter Maritime Strike Wing, Atlantic (COMHELMARSTRKWINGLANT);
- Helicopter Anti-Submarine Squadron Light Forty (HSL-40), with 12 SH-60s;
- Helicopter Anti-Submarine Squadron Light Forty Two (HSL-42), 14 SH-60s;
- Helicopter Anti-Submarine Squadron Light Forty Four (HSL-44), 14 SH-60s;
- Helicopter Anti-Submarine Squadron Light Forty Six (HSL-46), 14 SH-60s;
- Helicopter Anti-Submarine Squadron Light Forty Eight (HSL-48), 14 SH-60s; and
- Helicopter Anti-Submarine Squadron Light Sixty (HSL-60), 6 SH-60s.

2.2 History

The history of the Navy in Mayport began during the early stages of World War II when Mayport was selected to become the second southeast Naval installation. The city of Jacksonville provided the initial tract of 700 acres. The natural basin at the mouth of the St. Johns River was expanded and dredged to 29 feet, and used by patrol craft, rescue boats, and jeep carriers. When the base was commissioned in

1942, it occupied less than one quarter of the land acreage it does today. In 1943, Mayport was reclassified as a Naval Section Base.

A landing field and taxiway were completed during that year, and Mayport became a maintenance and fueling facility for submarines. The Naval Auxiliary Air Station was commissioned at Mayport on April 1, 1944. In 1945, the air station encompassed the entire site, including the pier and docking facilities. At the war's end, Mayport was decommissioned and placed in a caretaker status. In June 1948, Mayport was reactivated as a Naval Outlying Landing Field. By 1951, construction had begun for a carrier pier. *USS TARAWA* (CVS-40) was stationed at Mayport after the pier was completed.

By July 1, 1955, Mayport once again became a Naval Auxiliary Air Station. It had grown considerably in land area, command importance, and activity and it represented an investment of nearly $10 million. It included an 8,000-foot-long jet runway and an additional 4,200-foot runway. In 1959, Mayport was redesignated as Naval Station Mayport. The Naval Station received national exposure in 1962 during the Cuban missile crisis when NS Mayport served as an advanced staging area. From 1982 to 1984, ships homeported at NS Mayport were involved in operations off the coast of Beirut, Lebanon. In 1983, three NS Mayport ships were involved in Operation Urgent Fury, the rescue operation in Grenada.

Today, the Installation covers approximately 3,500 acres. NS Mayport is located in Duval County, Florida, near the confluence of the St. Johns River and the Atlantic Ocean, approximately 15 miles east of downtown Jacksonville. Duval County, which lies along the northeast coast of Florida, is bordered by Nassau County to the north, Baker County to the west, Clay and St. Johns Counties to the south, and the Atlantic Ocean to the east.

SR
State Route

The Atlantic Ocean and the St. Johns River are east and north, respectively, of NS Mayport. Huguenot Park, Little Talbot Island Park, and Fort George Island are north of the St. Johns River. Salt marsh and wetland communities are located southwest and west of the Installation. State Route (SR) A1A, Wonderwood Drive, and Kathryn Abbey Hanna

Park border the southern edge of NS Mayport. Land uses along the boundaries of the Installation generally provide good buffers between NS Mayport and surrounding communities. Commercial development around NS Mayport is located primarily in the community of Mayport, Florida, along SR A1A, and south of the naval complex along Mayport Road.

Existing land use at NS Mayport is the result of planned incremental development of facilities during station operation. In general, administration, maintenance, and repair functions are located adjacent to the waterfront, providing a logical grouping of activities around the ships and turning basin. The 8,000-foot runway and airfield operations lie west of the turning basin between the harbor operations and the community of Mayport. Housing and community facilities are separated from the industrial areas by the roadway network, administration facilities, and the golf course. The community of Mayport is situated on a narrow strip of land along the St. Johns River, northwest of NS Mayport between Chicopit Bay and the ferry boat station. The community of Mayport is comprised predominantly of single-family homes, with limited commercial and industrial uses along the riverfront. Residential densities are mostly low to medium (up to 15 units per acre).

2.3 Economic Contributions

NS Mayport provides a significant economic contribution to the City of Jacksonville. As of January 2004, the military/civilian payroll was $638.7 million and there were $200 million worth of goods and services purchased on the local economy (Austin 2006). The total economic impact of NS Mayport is $1.8 billion. This number was derived by the following formula (Austin 2006):

Payroll X 2.5 (economic multiplier) + Goods and Services

There are also 41,897 DoD retirees and Survivor Benefits recipients with a payroll of $857 million in the greater Jacksonville area.

3 Airspace and Aircraft Operations

3.1 Airspace

3.1.1 Airspace Vicinity

NS Mayport Tower provides airport traffic control (ATC) services to all aircraft operating below 2,500 feet above mean sea level within a 5-mile radius of NS Mayport. Airport traffic control also is provided to aircraft and vehicles operating on the taxiways and runways at NS Mayport. Approach/departure control and en route services are provided to aircraft operating within the airspace delegated to NS Mayport by the FAA.

ATC
air traffic control

3.1.2 Airspace Control Zones and Flight Procedures

NS Mayport has one runway (05/23) that is 8,000 feet long by 200 feet wide. NS Mayport is a Class IIIB ATC facility with control towers and ground-controlled approach (GCA) facilities providing full pattern control within its Class D airspace (5-nautical-mile radius). The aircraft flight pattern during takeoff is to the left when using Runway 05 and is to the right when using runway Runway 23, unless otherwise instructed. General utilization for Runway 05 is 49% of the total operations and 51% for Runway 23. When aircraft are flying patterns around the Station, the altitude is 500 feet above ground level (AGL) for helicopters and 1,000 feet AGL for fixed-wing aircraft. NS Mayport airfield's published operating hours are Monday through Thursday, 7:00 a.m. to 12:00 a.m. Daylight Savings Time (DST) (winter hours 7:00 a.m. to 11:00 p.m. EST); Friday, 8:00 a.m. to 6:00 p.m. DST (8:00 a.m. to 6:00 p.m. EST); Saturday and Sunday open by coordination for

GCA
ground-controlled approach

AGL
above ground level

DST
Daylight Savings Time

operational requirements only; and closed on holidays. Mission requirements may require flight operations outside of normal operating hours.

In calendar year (CY) 2003, the six HSL squadrons recorded approximately 20,000 total flying hours while operating from NS Mayport's airfield. Nonetheless, NS Mayport has operated free of Class A flight/flight-related mishaps over an 18-year period beginning January 21, 1988 (*see* Section 5.2.1). The only recently recorded flight mishap occurred in July 1997 when a T-45 flipped over on the runway surface.

CY
calendar year

3.2 Aircraft Operations

NS Mayport is currently the home station for 74 SH-60 helicopters. The primary users of the airfield are six Atlantic Fleet HSL squadrons, resident at NS Mayport under the Helicopter Maritime Strike Wing, Atlantic (COMHELMARSTRKWINGLANT). The HSL wing pilots fly the Sikorsky SH-60 Seahawk, which is the only aircraft that is permanently based at NS Mayport. However, a wide range of other military aircraft uses the runways on a transient basis to accomplish specific missions. The principal transient aircraft include the T-45, F/A-18, F-15, and C-12 (*see* Appendix A).

COMHELMARSTRK-WINGLANT
Helicopter Maritime Strike Wing, Atlantic

Over the past few years, NS Mayport's total annual flight operations have generally decreased from a high of 156,885 operations in 1993 to 103,066 in 2003. It is anticipated that NS Mayport's annual flight operations will remain steady at approximately 103,000 operations per year for the next few years. Table 3-1 summarizes annual flight operations at NS Mayport for the past 10 years. Figures 3-1 through 3-5 show the existing flight tracks for air operations at NS Mayport.

Source: Ecology & Environment, Inc. 2005; Wyle 2001; Naval Station Mayport 2000; National Park Service 2001

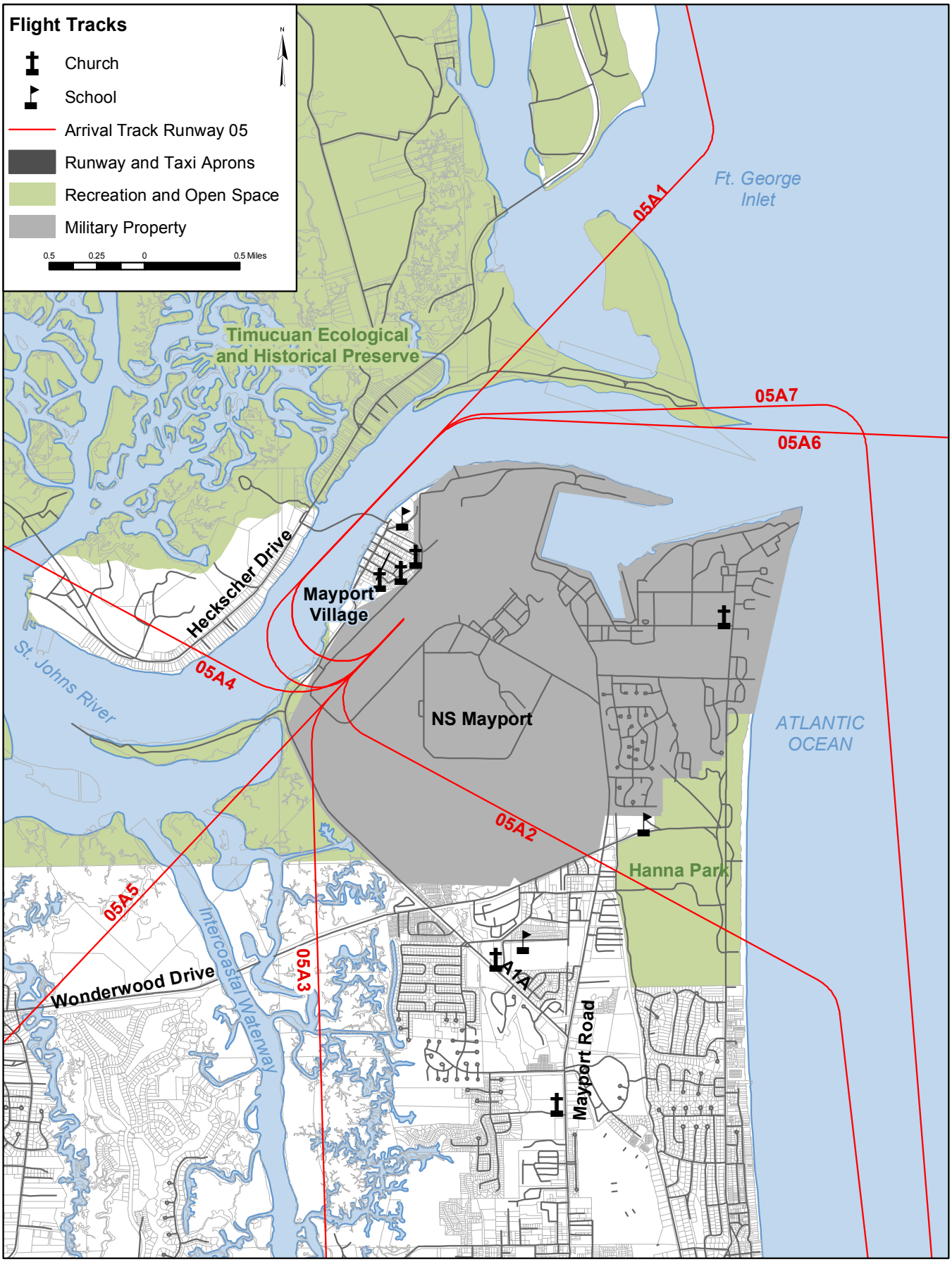

Figure 3-1
Arrival Flight Tracks - Runway 05
NS Mayport

Source: Wyle 2001; Naval Station Mayport 2000;
National Park Service 2001

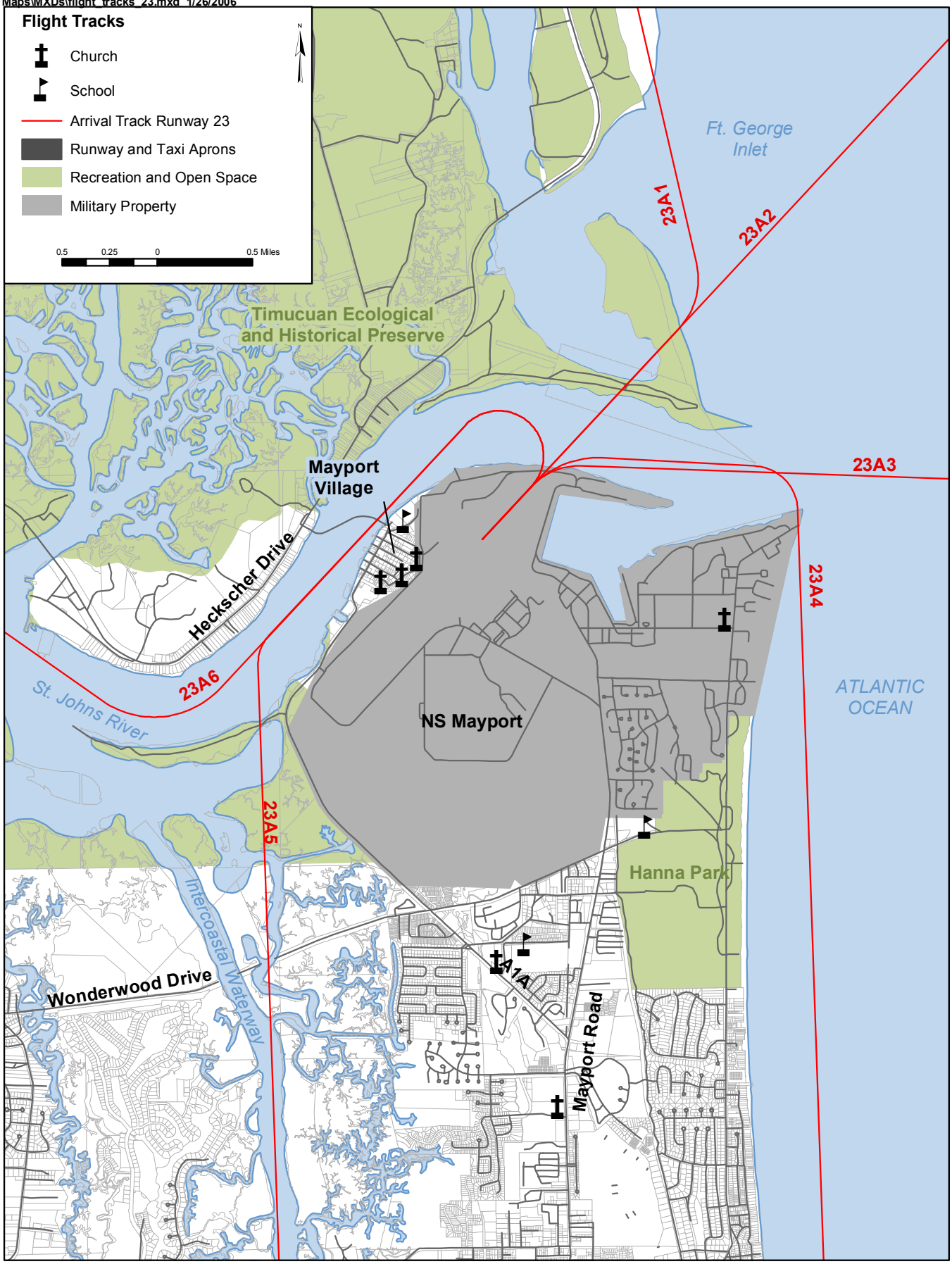

Figure 3-2
Arrival Flight Tracks - Runway 23
NS Mayport

Source: Wyle 2005; Naval Station Mayport 2000
National Parks Service 2001

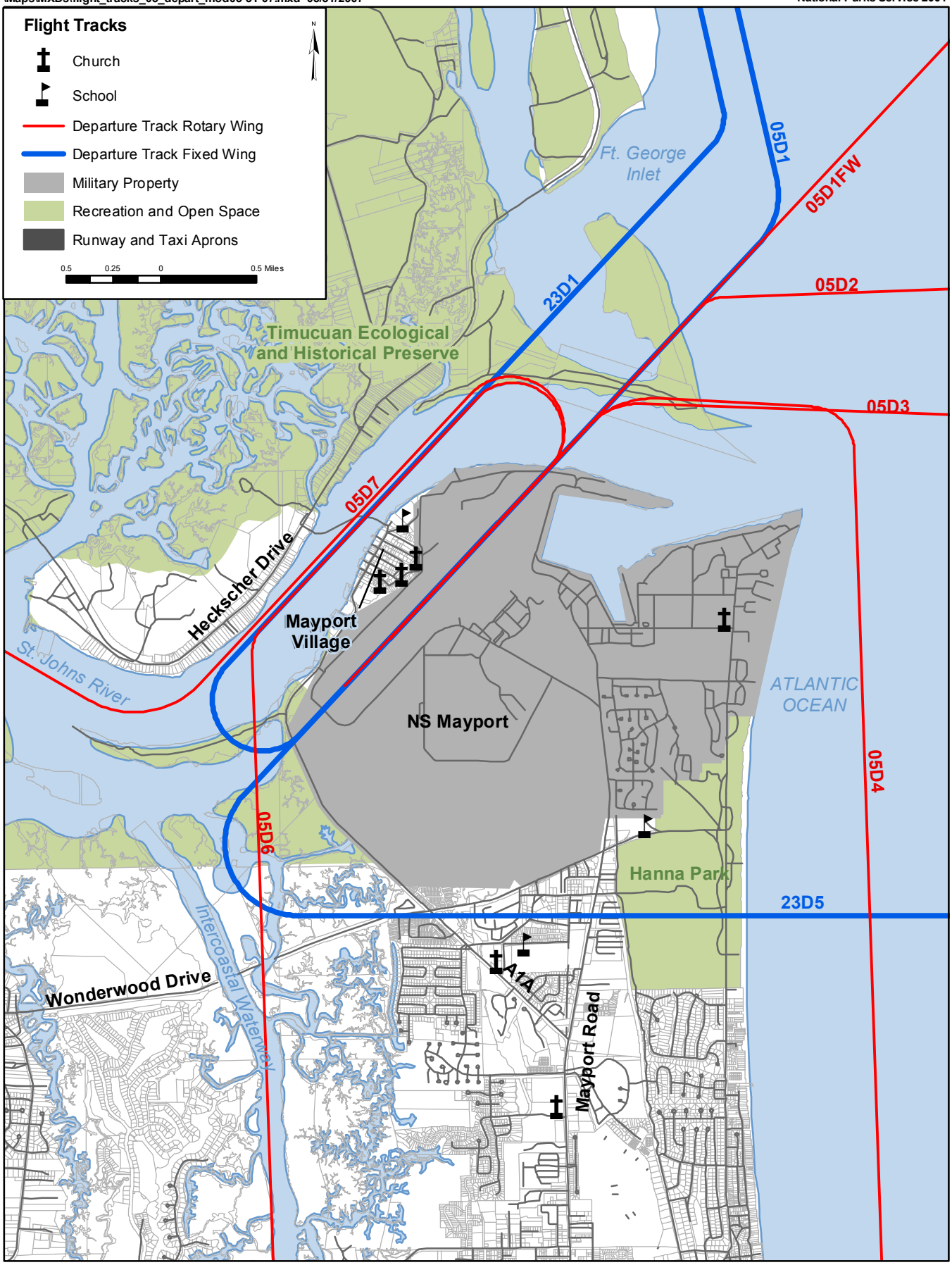

Figure 3-3
Departure Flight Tracks - Runway 05
NS Mayport

Source: Wyle 2005; Naval Station Mayport 2000; National Parks Service 2001

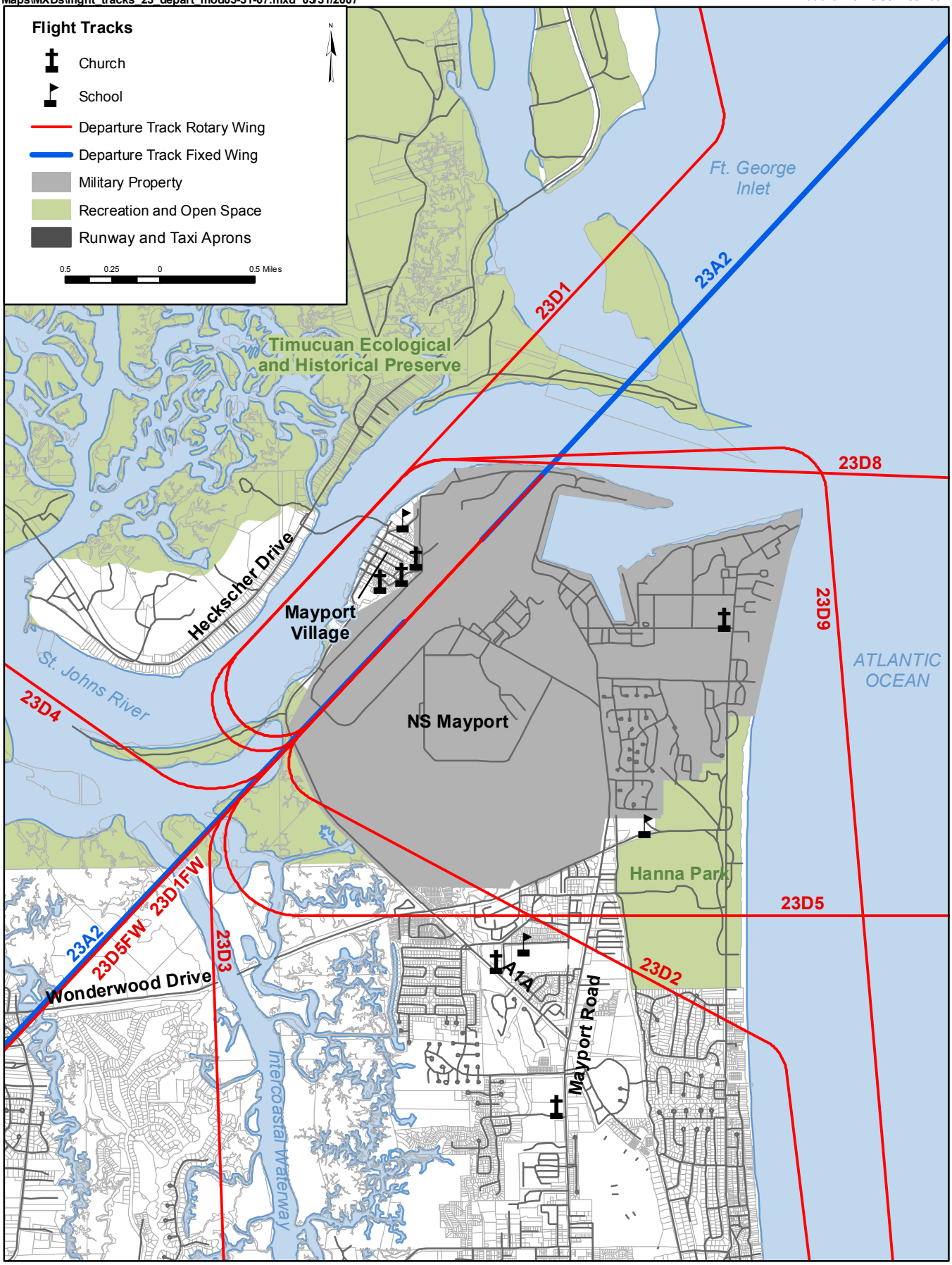

Figure 3-4
Departure Flight Tracks - Runway 23
NS Mayport

Source: Ecology & Environment, Inc. 2005; Wyle 2001; Naval Station Mayport 2000; National Park Service 2001

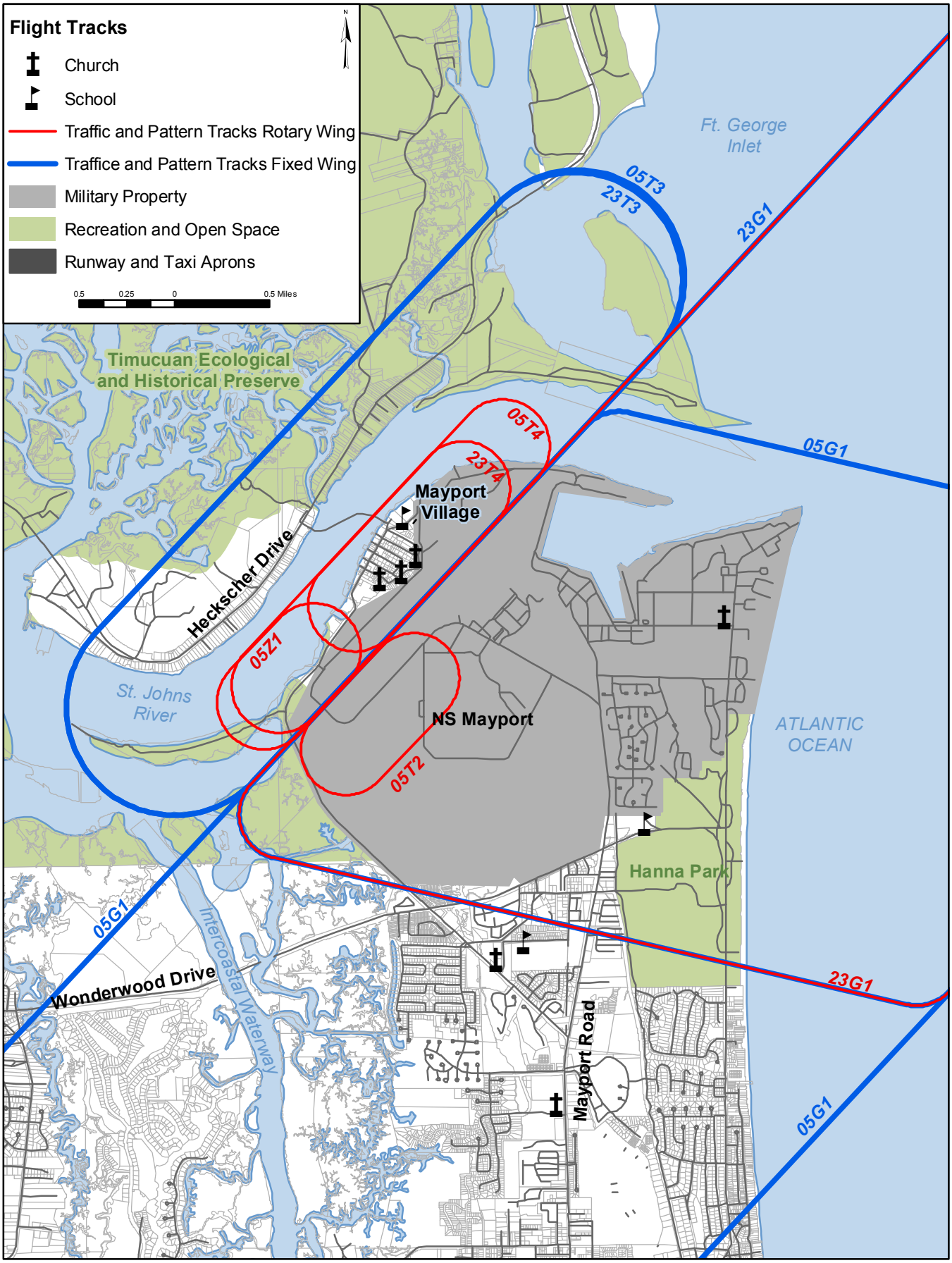

Figure 3-5
Traffic and Pattern Flight Tracks
NS Mayport

Table 3-1
Historical Airfield Operations
Naval Station Mayport, Florida

Calendar Year	MILITARY		CIVIL		Total
	Navy/Marine	Other	Air Carrier	General Aviation	
1993	155,076	879	74	856	156,885
1994	138,635	654	68	726	140,083
1995	134,061	274	28	917	135,280
1996	125,324	144	10	314	125,792
1997	86,499	1,016	36	50	87,601
1998	86,340	686	0	287	87,313
1999	90,974	270	0	141	91,385
2000	98,174	309	8	1,026	99,517
2001	101,209	895	8	1,118	103,230
2002	93,997	576	10	1,038	95,621
2003	101,919	455	18	674	103,066

Source: Wyle 2005.

3.2.1 Flight Operations

Flight Operation
Any aircraft takeoff or landing at NS Mayport

A flight operation refers to any takeoff or landing at NS Mayport. The takeoff and landing may be part of a training maneuver (or pattern) associated with the air station runway, or may be associated with a departure or arrival of an aircraft to or from defense-related special-use airspace.

Approved flight operations at NS Mayport are defined as:

- **Departure.** An aircraft taking off to a local training area, a non-local training area, or as part of a training maneuver (i.e., touch-and-go).
- **Straight-In/Full-Stop Arrival.** An aircraft lines up 6 to 10 nautical miles from the field on runway centerline. The aircraft descends gradually, comes to a full stop, and then taxis off the runway.
- **Overhead Arrival.** An expeditious arrival using visual flight rules. An aircraft approaches the runway 500 feet above the altitude of the landing pattern. Approximately halfway down the runway, the aircraft performs a 180-degree turn to enter the landing pattern. Once established in the pattern, the aircraft lowers landing gear and flaps, and performs a 180-degree descending turn to land on the runway.

GCA
ground-controlled approach

- **Ground-Controlled Approach (GCA) Box.** A radar or "talk down" approach directed from the ground by ATC personnel. ATC personnel provide pilots with verbal course

and glide slope information, allowing them to make an instrument approach during inclement weather.

- **Touch-and-Go Operation.** An aircraft lands and takes off on a runway without coming to a full stop. After touching down, the pilot immediately goes to full power and takes off again. The touch-and-go actually is counted as two operations – the landing is counted as one operation and the takeoff is counted as another.

FCLP
Field Carrier Landing Practice

- **Field Carrier Landing Practice (FCLP).** An aircraft practices simulated carrier landings. FCLPs are required training for all pilots before landing on a carrier. The number of FCLPs performed is determined by the length of time that has elapsed since the pilot's last landing on a carrier. FCLPs normally are not conducted at NS Mayport.
- **Low Approach.** An instrument approach to a runway where the pilot does not make contact with the runway.

GSI
Glide Slope Indicator

- **Glide Slope Indicator (GSI).** An aircraft practices approach to a simulated frigate deck from 1.2 miles out and 400 feet AGL. One landing and one takeoff are counted as two operations.

During CY2003, NS Mayport recorded 103,066 aircraft operations within the Air Installation's airspace, including takeoffs, landings, touch-and-gos and approaches. The operations modeled in this report were Navy, Marine, and other military operations that totaled 101,568. The remaining 1,498 operations were aircraft which transited the NS Mayport controlled airspace, but never actually utilized the airfield. Helicopter operations represented about 97%, or 100,256 operations, of the annual operations. The combined average number of operations per active day at NS Mayport in CY2003 is shown in Table 3-2.

Table 3-2
Annual Day and Night Airfield Operations for Calendar Year 2003
Naval Station Mayport, Florida

	SH-60	C-12	F/A-18 C/D	F-15	T-45	Other Aircraft	Total
Departures							
0700-2200	3,863	72	10	4	38	83	4,069
2200-0700	235	2	0	0	0	0	238
Total	**4,099**	**74**	**10**	**4**	**38**	**83**	**4,307**
"Straight-in" Full-Stop Arrival							
0700-2200	3,863	74	0	4	38	83	4,061
2200-0700	235	1	0	0	0	0	236
Total	**4,099**	**74**	**0**	**4**	**38**	**83**	**4,297**
Overhead Break Arrival							
0700-2200			10				10
2200-0700			0				0
Total	**0**	**0**	**10**	**0**	**0**	**0**	**10**
Touch & Go							
0700-2200	76,651	295	39	0	0	52	77,037
2200-0700	3,788	2	0	0	0	0	3,791
Total	**80,439**	**297**	**39**	**0**	**0**	**52**	**80,828**
Glide Slope Indicator (GSI)							
0700-2200	0						0
2200-0700	1,641						1,641
Total	**1,641**	**0**	**0**	**0**	**0**	**0**	**1,641**
Ground-Controlled Approach (GCA) Box							
0700-2200	8,691	42	3	8	75	375	9,195
2200-0700	1,288	0	1	0	0	1	1,290
Total	**9,979**	**42**	**5**	**8**	**75**	**375**	**10,485**
Grand Totals							
0700-2200	93,068	482	63	16	151	593	94,373
2200-0700	7,188	5	1	0	0	1	7,195
Total	**100,256**	**487**	**64**	**16**	**151**	**594**	**101,568**

Notes:
Touch & Go and Field Carrier Landing Practice (FCLP) activity counted as two operations each.
Due to rounding the totals in the above table may not match.

3.2.2 Pre-Flight and Engine Maintenance Run-up Operations

Maintenance Run-ups
Testing of aircraft engines for maintenance operations

Pre-flight engine run-ups prior to departure at runway ends and scheduled maintenance engine run-ups at test cells or at run-up pad locations can contribute significantly to the total noise environment. According to ATC, NS Mayport, the SH-60s at NS Mayport typically do not conduct any preflight run-ups (Wyle 2005). The F/A-18 is modeled for noise with a 10-second preflight run-up at 80% power. The remaining fixed-wing aircraft are modeled with a minimum allowable standard initial takeoff roll run-up of five seconds at the initial profile power setting.

Maintenance run-ups are conducted at NS Mayport and the run-up locations are depicted on Figure 3-6; Table 3-2 lists the run-up operations for the locations depicted on Figure 3-6. The SH-60 is the only aircraft utilizing these run-up areas since it is the only permanently based aircraft at the Installation. The tempo of activity at the in-frame run-up locations, R1/R2 and R3/R4, are modeled using the same directional split as used for the runway or flight operations. In this case, 49% are in the Runway 05 direction and 51% are in the Runway 23 direction. All out-of-frame run-ups occur at location R5 and operate on an approximate 60 degree heading (from the north). All run-ups occur during the daytime period.

Flight Track
General pre-determined path an aircraft flies while conducting air operations near and airfield

3.2.3 Runway and Flight Track Utilization

The numerical designation of a runway is the number of degrees (rounded to the nearest 10th) that each end of the runway is aligned from the north point of a compass. Runway 5, for example, is aligned 50 degrees from magnetic north. Runway 23 is the opposite end of Runway 5, or 230 degrees (50 degrees plus 180 degrees) from magnetic north. Aircraft approaching or departing from the air stations are assigned specific routes or flight tracks. Flight tracks shown in this report are idealized representations (single lines), but flights vary due to aircraft

Source: ESRI, 2005; Wyle 2006;

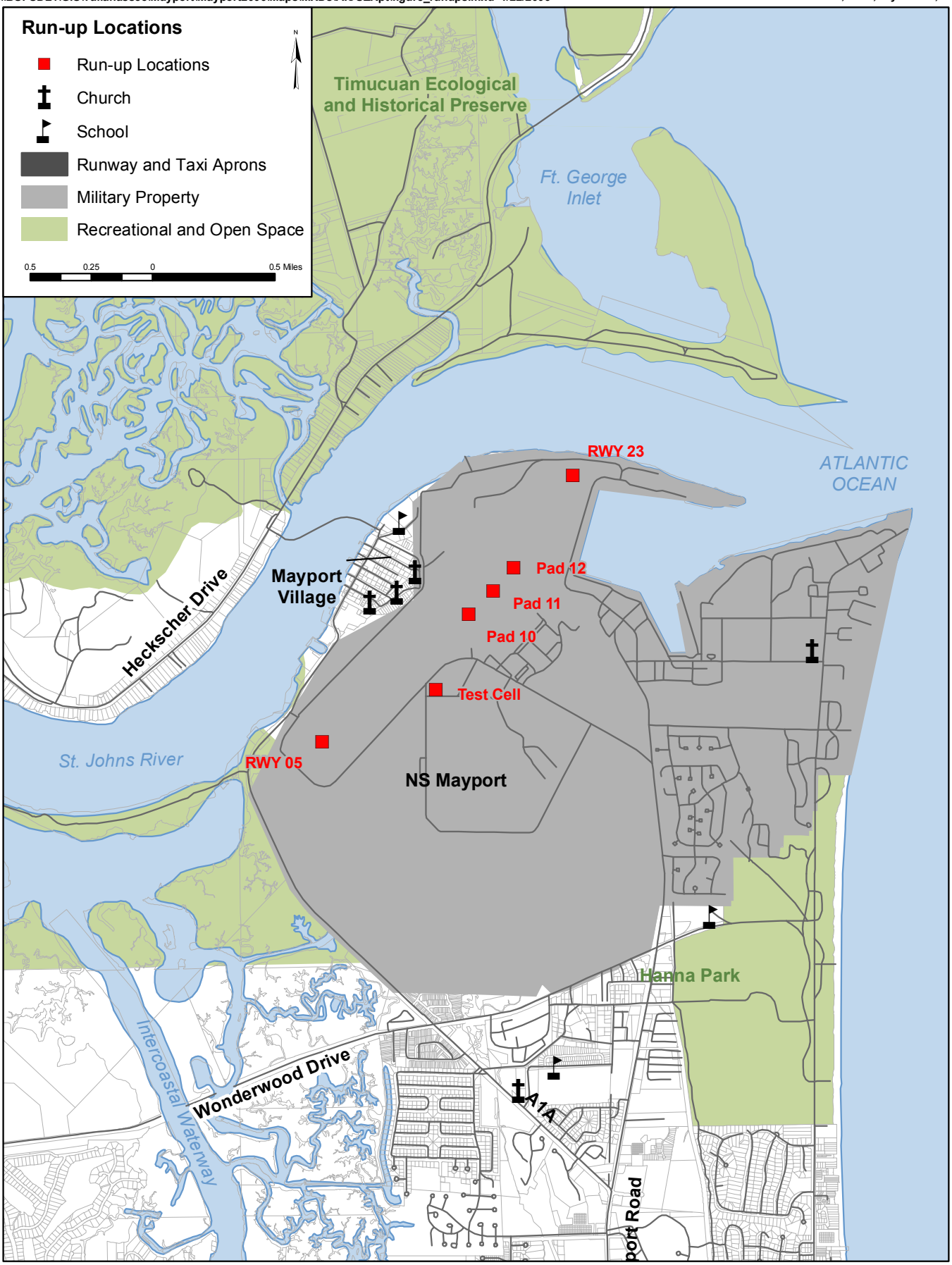

Figure 3-6
Run-up Locations
NS Mayport

type, performance, configuration, pilot technique, air traffic conflicts, and weather conditions (e.g., wind), such that the actual flight track is a band, often one-half to several miles wide. Predominant arrival, departure, and pattern flight tracks for Runways 05 and 23, respectively, are shown on Figures 3-3 to 3-5.

Flight tracks were provided by personnel at NS Mayport ATC. Figures 3-3 through 3-5 show the flight tracks for the types of operations listed in Table 3-2. According to NS Mayport ATC, runway use at NS Mayport occurs 49% of the time on Runway 05, and 51% of the time on Runway 23. Figure 3-3 shows the departure flight tracks for Runway 05. Note that fixed-wing aircraft use only departure track 05D1 off Runway 05 and departure tracks 23D1 and 23D5 off Runway 23. Figure 3-4 shows the departure flight tracks for Runway 23. Note that fixed-wing aircraft use only arrival track 05A5 to Runway 05 and track 23A2 to Runway 23. Figure 3-5 depicts the touch-and-go, GCA box and GSI patterns flown at NS Mayport. Fixed-wing aircraft use only the GCA box tracks 05G1 and 23G1, and the touch-and-go tracks 05T3 and 23T3. Helicopters use all the closed tracks, except 05T3 and 23T3. For detailed tables depicting runway and flight track utilization for all modeled aircraft, please refer to Appendix A.

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4 Aircraft Noise

Aircraft noise is of concern to many in the Installation's surrounding community. Aircraft noise may potentially impact the planning of future land use near air facilities. Because the noise from aircraft operations significantly impacts areas surrounding an installation, NS Mayport has defined certain areas as high-noise zones under their AICUZ Program. This section discusses noise associated with aircraft operations at NS Mayport, including average noise levels, noise complaints, noise abatement/flight procedures, and noise contours.

4.1 What is Sound/Noise?

Sound is the result of a sound source inducing vibrations in the air.

Noise can be defined as unwanted sound.

Sound is the result of a sound source inducing vibrations in the air. Noise can be defined as unwanted sound. Some of the potential sources of noise include roadway traffic, land use activities, railway activities, and aircraft operations. Whether sound becomes noise is dependent upon the listener, but sound can become noise when it interferes with normal activities.

dBA
A-weighted decibel; a unit of sound pressure, adjusted to the range of human hearing, with an intensity greater than the ambient or background sound pressure.

In this document all sound or noise levels are measured in A-weighted decibels (dBA), which are a unit of sound pressure adjusted to the range of human hearing, with an intensity greater than the ambient or background sound pressure. Normal speech has a noise level of approximately 60 dBA; sound levels above 110 dBA begin to be felt inside the human ear as discomfort.

DNL
day-night average sound level noise metric.

The noise exposure from aircraft operations at NS Mayport, as with other installations, is measured using the day-night average sound level noise metric (DNL). DNL (sometimes expressed as Ldn) is an indicator of community sensitivity to aircraft noise and is the standard metric used in most states. The acronym DNL is typically used as the descriptor for day-night average sound level and is used throughout this

report. The DNL averages aircraft sound levels at locations over a 24-hour period with an additional 10-dBA weighting imposed on equivalent daytime sound levels that occur during nighttime hours (10:00 p.m. to 7:00 a.m.). The 10-dBA adjustment is to account for an increased sensitivity to noise at this time and low ambient noise levels, which are about 10 dBA lower than daytime hours.

The DNL does not represent the sound level heard at any particular time within the designated 24-hour period, but is the averaging of all the sound energy over a 24-hour-period while maintaining the same total sound exposure. The smoothing of noise over the 24-hour period does not ignore the louder single events. When noise levels of two or more events are added, the event with the lower noise level is dominated by the event with the higher noise. Thus, the combined noise level is slightly higher than the noise level produced by the louder event. For example, a sound level of 100 dBA that lasts for 30 seconds, followed by a sound level of 50 dBA which lasts for 30 seconds has a time average sound level of 97 dBA. Therefore, noise levels of the loudest aircraft operations significantly influence the 24-hour average.

The DNL is depicted visually as a noise contour that connects points of equal value. The noise contours in this document are depicted in 5-dB increments. The area between two noise contours is known as a noise zone. The noise exposure area is divided into noise zones as follows:

- Less than 60 DNL;
- 60 to 65 DNL;
- 65 to 70 DNL;
- 70 to 75 DNL; and
- Greater than 75 DNL.

For land use planning purposes, the noise zones can be generally characterized as follows. The noise zone of less than 60 DNL is generally considered an area of low or no noise impact. 60-65 DNL is an area of slight impact where some land use controls are required. 65-75 DNL is an area of moderate impact where some further land use controls

are required. The noise zone greater than 75 DNL is the most severely impacted area and requires the greatest degree of land use control.

4.2 Airfield Noise Sources

The main sources of noise at airfields are flight operations and engine maintenance operations or run-ups. Computer models are used to develop the noise contours based on information about these operations, including:

- Type of operation (arrival, departure, pattern);
- Number of operations/day;
- Time of operation;
- Flight track;
- Type of surface;
- Type of terrain;
- Aircraft power settings, speeds, and altitudes;
- Number and duration of maintenance run-ups; and
- Environmental data (temperature and humidity).

4.3 Noise Complaints

Noise complaint procedures for NS Mayport are established in the Installation's Air Operations Manual. The procedures address how noise complaints shall be received, the responsible parties to be advised of the noise complaint, and what type of action is required to address the compliant. Individual response to noise levels varies and is influenced by many factors including:

- Activity the individual is engaged in at the time of the noise;
- General sensitivity to noise;
- Time of day;
- Length of time an individual is exposed to a noise;
- Predictability of noise; and
- Average temperature.

Generally, community noise complaints are called in to the Air Operations Center at NS Mayport. From there, the complaints are routed

Noise Complaint Hotline
Complaints can be called in to: (904) 270-5144

to the responsible squadron, the Public Affairs office, and the Naval Station Commanding Officer. NS Mayport is currently in the process of revising their Air Operations Manual. Some of the revisions address the installation of a designated automated call-in line for the purpose of registering and recording noise complaints. Complaints can be called in to: (904) 270-5144. Calls continue to be processed in the above-mentioned manner.

A small change in dBA generally will not be noticeable. As the change in dBA increases, individual perception is greater, as shown in Table 4-1.

Table 4-1
Subjective Response
Naval Station Mayport, Florida

Change	Change in Perceived Loudness
1 decibel	Require close attention to notice
3 decibel	Barely noticeable
5 decibel	Quite noticeable
10 decibel	Dramatic – twice or half as loud
20 decibel	Striking – fourfold change
Source: Wyle 2005.	

4.4 Noise Abatement/Course Rules

NS Mayport actively pursues operational measures to reduce noise. The Navy conducts noise abatement procedures to the best of its ability, commensurate with safety and operational training requirements. Other actions and requirements under the NS Mayport Air Operations Manual (NS Mayport 2005) established for NS Mayport directly or indirectly affect noise abatement and flight safety both on the ground and in the air. Noise abatement procedures for NS Mayport are implemented under the NS Mayport Air Operations Manual and are summarized in Table 4-2. The purpose of these procedures is to minimize noise in recognition of community response to aircraft noise at NS Mayport.

Table 4-2
Noise Abatement/Flight Procedures
Naval Station Mayport, Florida

Noise Abatement/Air Installations Compatible Use Zones.

- High-power turn-ups in excess of normal pre-takeoff checks are prohibited anywhere on the airfield except in the designated high-power turn-up and are to be conducted only during published airfield operating hours.
- When operations are being conducted on Runway 05, downwind turns south of the lighthouse shall not be approved. This is to ensure aircraft do not overfly the city of Mayport. SH-60 only.
- Aircraft must be at pattern altitude prior to turning downwind. SH-60 only.

Additional procedures which directly or indirectly affect noise abatement include the following:

- **Hours of Operation.** NS Mayport operates Monday through Thursday 7:00 a.m. to 12:00 a.m. DST; Friday 8:00 a.m. to 6:00 p.m. DST; Saturday and Sunday open by co-ordination for operational requirements only; closed holidays. Written request for holiday and/or extended operating hours should be forwarded to the NS Mayport Airfield Operations Officer seven days in advance of the desired date.
- **Run-up Operations.** All pre-takeoff high-power engine checks shall be done at the run-up area adjacent to the duty runway.
- **Flight Paths.** Pilots shall not request clearance to perform unusual maneuvers within the airport traffic area if such maneuvers are not essential to the performance of the flight. ATC personnel are not permitted to approve a pilot's request, or to ask a pilot to perform these maneuvers, to include low passes, climbs at very steep angles, Mission profiles which require uninterrupted (unrestricted) climbs to altitude should be coordinated through the ATC facility so that clearances may be obtained
- **Airspace.** Unless otherwise approved, all classes of aircraft in reported VFR condition, regardless of type flight plan, shall maintain 1,000 feet until one mile beyond the departure end threshold to avoid inbound overhead traffic from the departure end threshold. The pattern is left traffic for Runway 05 and right traffic for Runway 23 unless otherwise instructed. Pattern altitude is 500 ft AGL for helicopters and 1000 ft AGL for fixed-wing aircraft.
- **Quiet Hour Operations.** During published quiet hours all airfield movement will be limited. Emergency and PPR aircraft for full stop landing only. No takeoffs, turn-ups, low approaches or taxiing will be authorized. Written requests for quiet hours will be forwarded to the Commanding Officer, NS Mayport (Attention: Air Operations Officer). Requests must be received by Airfield Operations a minimum of five working days prior to the requested quiet hours.

Source: NS Mayport 2005, Wyle 2005.
Key:

AGL	= Above ground level.
ATC	= Air traffic control.
DST	= Daylight Savings Time.
NM	= Nautical mile.
PPR	= Prior permission required.
TACAN	= Tactical Air Navigation
VFR	= Visual flight rules.

4.5 Noise Contours

The AICUZ process calls for the modeling and analysis of existing and projected conditions that can be reasonably forecast. The existing conditions are described by the flight operations input data that consist of the aircraft types using the airfield, flight operations, and flight tracks of those aircraft.

The Navy AICUZ noise study is based on existing (2003) and projected operational data. The initial step in the AICUZ process is the preparation of a noise study to define ground-level noise exposure

Transient Aircraft Operations
While NS Mayport's mix of transient fixed-wing aircraft will evolve over the next few years, the total of annual transient operations is expected to remain the same.

contours. The noise study is developed using a computer-based model (NOISEMAP and Rotorcraft Noise Model [RNM] in this study) which uses as input aircraft activity and site-specific operational data at the Installation. This includes type and mix of aircraft, flight profiles (airspeed, altitude and power settings), and flight tracks, along with frequency and times of operations. Projections of aircraft operations were based on information provided by personnel at NS Mayport and the Southern Division of Naval Facilities Engineering Command. While the mix of transient fixed-wing aircraft will evolve over the next few years, the total of annual transient operations is expected to remain about the same. Over the next few years, as older Hornets retire, the predominant transient aircraft in the noise environment will be the F/A-18 E/F Super Hornets. For the purposes of modeling, the Super Hornet was used to represent all transient fixed-wing aircraft to ensure the Navy noise impacts are not underrepresented.

Land use compatibility guidelines and long-term noise exposure assessments are based on yearly average noise levels. Therefore, the 2006 noise contours for NS Mayport were developed based on average annual day (AAD) operations. The AAD operations level is calculated by dividing the total annual airfield operations by 365 days, consistent with Navy guidelines OPNAVINST 11010.36B, dated December 2002. See Appendix A for a detailed discussion of noise modeling.

AAD
average annual day; The AAD operations level is calculated by dividing the total annual airfield operations by 365 days.

4.5.1 2006 Noise Contours

The main noise source at the Air Installation is aircraft operations, including flight operations and engine maintenance operations or run-ups. NS Mayport provides facilities and support for the homebasing and training of the HSL helicopter squadrons. Helicopters are relatively quiet when compared to other aircraft, particularly in relation to jet aircraft. Thus, operations at NS Mayport by transient fixed-wing aircraft, though relatively few in number, contribute greatly to the overall noise environment.

The 2006 AICUZ noise contours generated from this effort for NS Mayport are shown on Figure 4-1. In order to be consistent with the

City of Jacksonville planning standard, the 2006 noise contours for NS Mayport include the 60 to 65 DNL noise contour. The contour shape and size are dictated by operations from both helicopters and fixed-wing aircraft, each contributing to a unique portion of the contour. While the SH-60 conducts the largest number of operations of all the aircraft at NS Mayport, it is not the only major noise contributor, nor is it the loudest in terms of a single event. Therefore, the contours present the cumulative noise contributions from each aircraft operation along each modeled flight track. The following observations are made to explain the shape and extent of the DNL contours shown on Figure 4-1:

- The extensions of the contours in the northeast and southwest directions are due mainly to the arrival operations of fixed-wing aircraft. The arrivals result in length/extension of the contour and the departures contribute to the width/spreading of the contour.
- The lobes off the end of the runway are due to the pre-flight run-ups conducted by the F/A-18 C/D aircraft.
- The 60-dB contour extension over water, north of the runway, is due to helicopter closed-pattern operations.
- The 60-dB noise "island" to the southwest is where the helicopter closed-pattern operations and runway departure flight tract 32D2 intersect.
- The ripples in the 65-dB contour abeam the runway to the southeast are caused by the hover checks and ground checks done by the helicopters at Pads 10, 11, and 12.

NS Mayport Noise Contours
Because NS Mayport's noise contours are primarily contained within the Air Installation boundary or over open waters/wetlands, very few people and a relatively small area of land outside the base boundary are within the noise contours.

As shown on Figure 4-1, the DNL contour levels resulting in off-station noise impacts outside the confines of NS Mayport are the 60-dB and 65-dB contours. (In order to be consistent with the City of Jacksonville planning standard, the 2006 noise contours for NS Mayport include the 60 to 65 DNL noise contour.) This off-base exposure is mainly due to the fixed-wing arrivals from Runways 05 and 23. The noise exposure is reflective of the flight tracks used by aircraft at NS Mayport. Considering that NS Mayport's noise contours are primarily contained within the Air Installation boundary, or over open water/wetlands, very few people and a relatively small area of land outside the base boundary near the Village of Mayport are within the

Source: ESRI, 2005; Wyle, 2005; NS Mayport, 2005

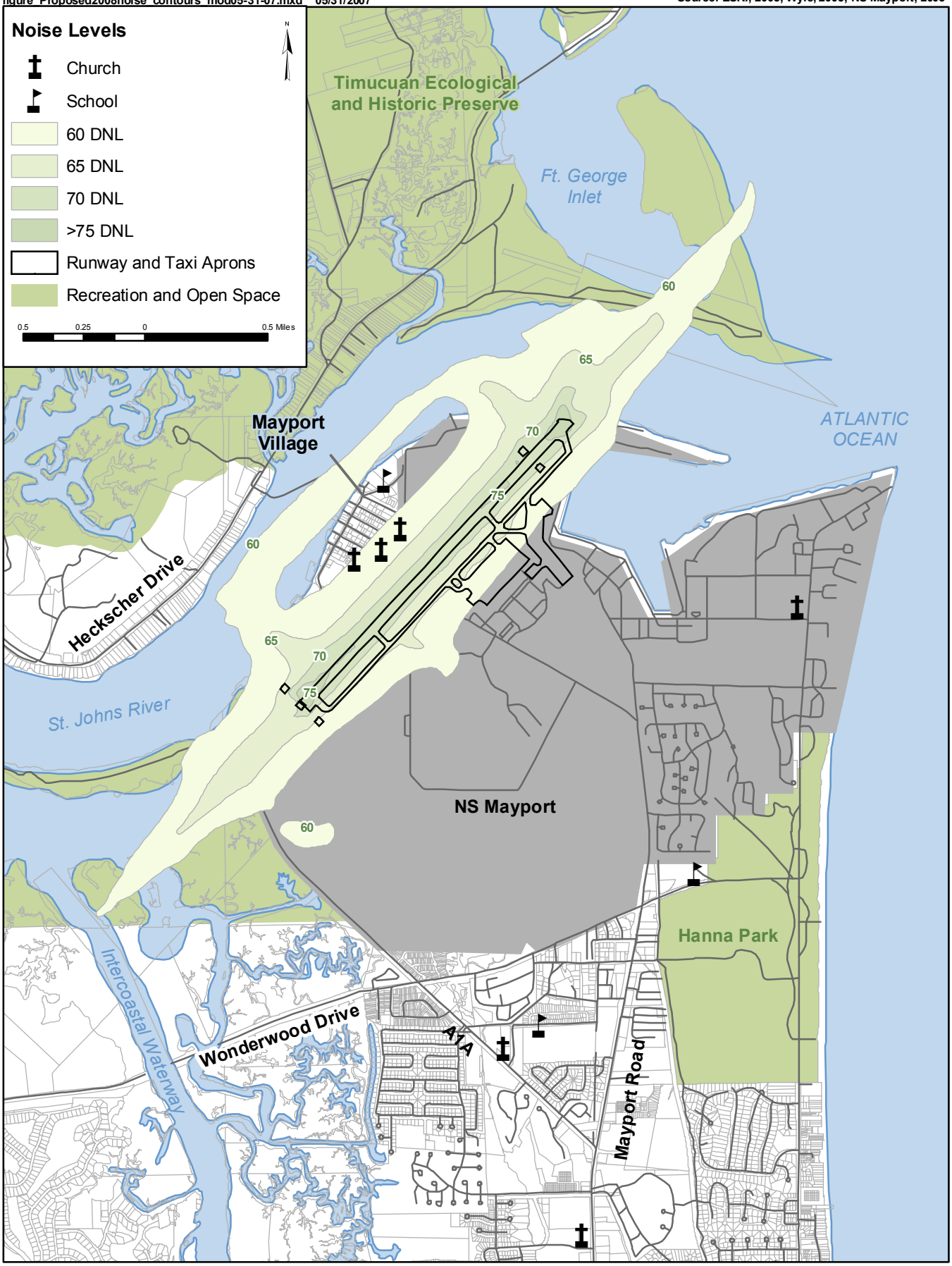

Figure 4-1
2006 AICUZ Noise Contours
NS Mayport

noise contours. Population and area counts are performed to provide estimates on how many people and how much land area is encompassed by the noise contours. This is based on the latest available Census 2000 data. Table 4-3 summarizes the people and acres exposed to noise in the 2006 AICUZ noise contours. There are 128 acres and 140 people living in 67 housing units exposed to noise levels between 60 DNL and 65 DNL. Likewise, the table indicates the impact of the noise exposure for noise levels from 65 DNL to 75 DNL and for greater than 75 DNL.

Table 4-3
Off-Base Population and Area Impact for 2006 Noise Contours
Naval Station Mayport, Florida

DNL	Population	Housing Units	Area (acres)
60 to 65	140	67	128
65 to 75	8	4	9
Greater than 75	0	0	0

Source: Wyle 2005.
Note:
Total areas exclude areas within the Installation and over water.
Key:
DNL = Day-night average sound level.

4.5.2 Comparison of the 1976 and 2006 AICUZ Noise Contours

Figure 4-2 compares the established 1976 NS Mayport AICUZ noise contours with the 2006 noise contours prepared for this AICUZ update. Table 4-4 compares the 1976 area within the high-noise zone with the 2006 area within the high-noise zone. The total acres within noise zones decreased by 318 acres; however, the geographic extent and distribution of the contours has changed. Significant differences in the area encumbered by high-noise are identified within the 65 to 70 DNL range.

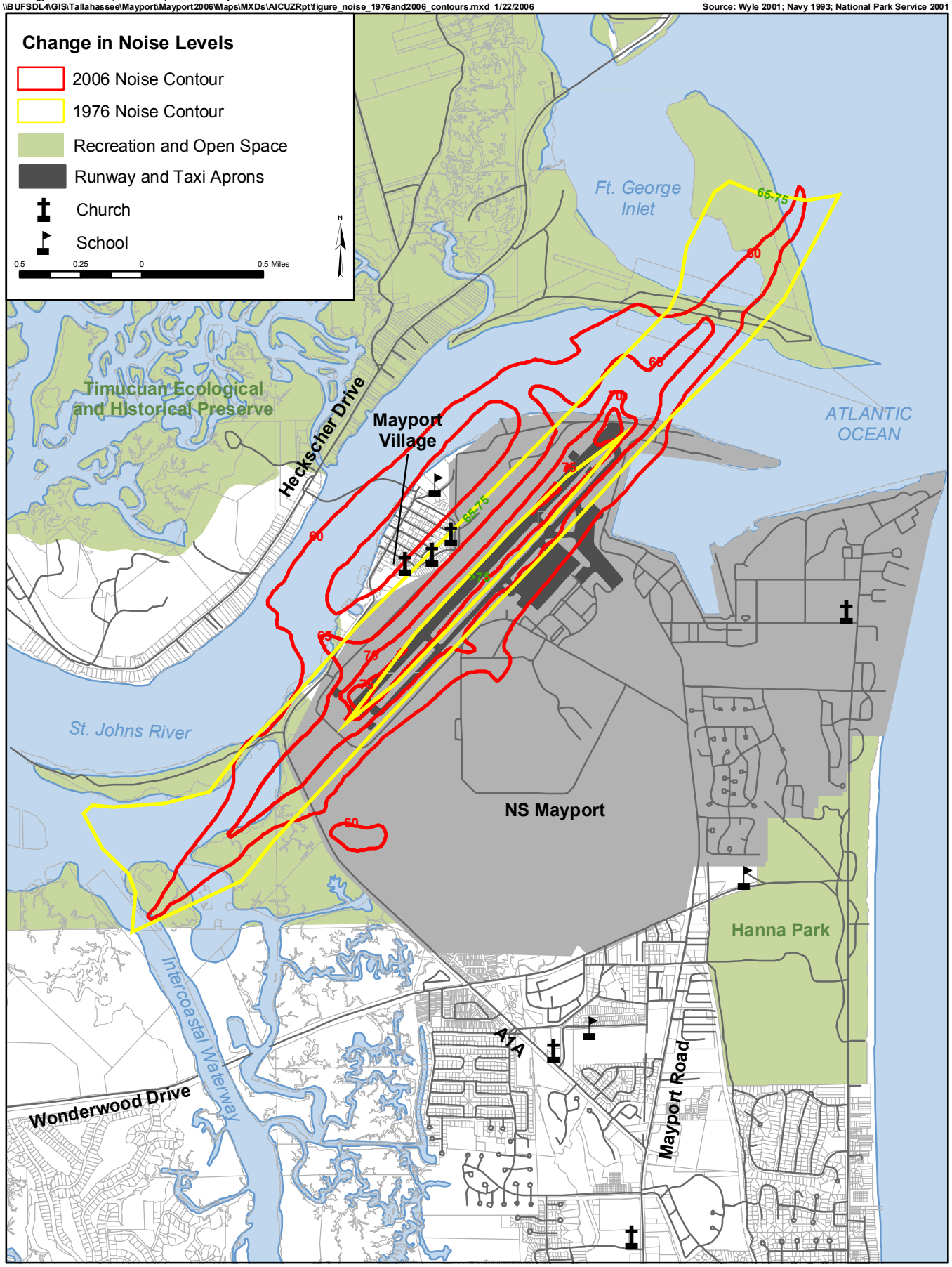

Figure 4-2
Comparison between 1976 and 2006 Noise Contours
NS Mayport

Table 4-4
Areas within Noise Zones (DNL)
1976 and 2006
Naval Station Mayport, Florida

Noise Zone (DNL)	TOTAL LAND AREA	
	1976 AICUZ Noise Zones (acres)	2006 AICUZ Noise Zones (acres)[a]
65 to 75	1,366	1053.4
Greater than 75	19	13.6
TOTAL AREA	**1,385**	**1,067**

Source: Wyle 2005.
Note:
[a] Total areas include areas within the Installation and over water.
Key:
DNL = Day-night average sound level.
AICUZ = Air Installations Compatible Use Zones.

The difference in the geographic extent of the noise contours can be attributed to a number of different factors. In 1976, noise modeling did not include the 60 DNL contour and computer modeling software was not as sophisticated and accurate as it is today.

The 2006 AICUZ noise contours were modeled using a combination of modeling software such as NOISEMAP 7.0 and RNM, which is designed specifically to model noise emissions from helicopter operations. A further difference is the distribution of air operations. In 1976, NS Mayport conducted vastly different air operations, including a larger number of fixed-wing operations than are currently being conducted.

RNM
Rotorcraft Noise Model.

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5 Airfield Safety

The Navy has identified airfield safety issues to assist the community in developing land uses compatible with airfield operations. These issues include accident potential and hazards within the airfield vicinity that obstruct or interfere with aircraft arrivals and departures, pilot vision, communications, or aircraft electronics.

While the likelihood of an accident is low, the DoD has defined APZs around military airfields to assist communities with compatible development. Within these zones, Navy guidelines recommend that people-intensive land uses (such as residential, schools, stadiums, etc.) be avoided.

In addition, the FAA and the military have defined flight safety zones (imaginary surfaces) below aircraft departure and approach flight tracks. For the safety of the aircraft, the height of structures and vegetation is restricted in these zones. The flight safety zones are designed to reduce the hazards that can cause aircraft mishaps; the APZs are designed to minimize the potential harm if a mishap does occur.

Other hazards to flight safety that should be avoided in the airfield vicinity include:

- Uses that would attract birds, especially waterfowl;
- Lighting (direct or reflected) that would impair pilot vision;
- Uses that would generate smoke, steam, or dust; and
- EMI with aircraft communication, navigation, or other electrical systems.

EMI
Electromagnetic interference; the inhibition or prevention of clear reception of broadcast signals.

5.1 Accident Potential Zones

In the 1970s, recognizing the need to identify areas of accident potential, the military conducted a tri-service study of historic accident and operations data throughout the military. The study showed that most

APZs are areas where an aircraft accident is most likely to occur, but does not reflect the probability of an accident occurring.

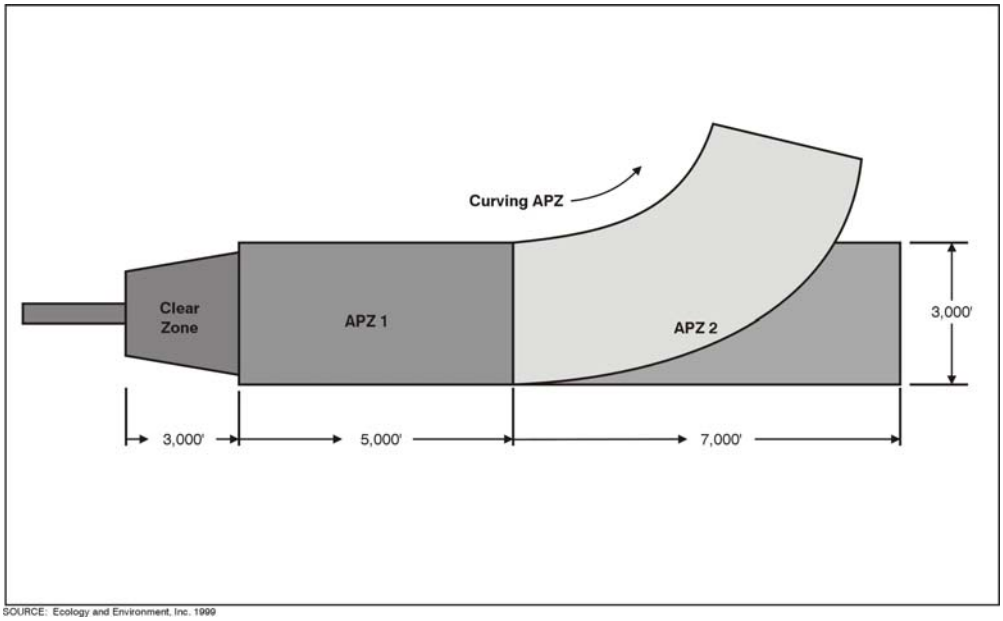
aircraft mishaps occur on, or near, the runway or along the centerline of the runway, diminishing in likelihood with distance. Based on the study, the DoD has identified APZs as areas where an aircraft accident is most likely to occur, if one occurs; they do not reflect the probability of an accident. APZs follow departure arrival and pattern flight tracks and are based upon analysis of historical data

5.1.1 APZ Configurations and Areas

NAVFAC
Naval Facilities Engineering Command

NS Mayport's APZs were developed using the guidance provided by OPNAVINST 11010.36B, Air Installations Compatible Use Zones Program, 2002; Naval Facilities Engineering Command (NAVFAC) P-80.3, Facilities Planning Factor Criteria for Navy and Marine Corps Shore Installations, Appendix E, Airfield Safety Clearances, 1982; and UFC 3-260-01, "Unified Facilities Criteria, Airfield and Heliport Planning and Design," dated November 1, 2001. The areas for the airfield Primary Surface and Clear Zone for fixed-wing operations, and a Primary Surface, Clear Zone, and APZ 1 for helicopter operations were developed using the above guidance. Data regarding specific flight profiles and helicopter elevations along various flight tracks were provided by the COMHELMARSTRKWINGLANT (Wyle 2005). Since NS Mayport experiences less than 5,000 fixed-wing operations annually, APZs for fixed-wing operations are not required. An APZ 2 for helicopter operations also normally is not required unless local accident history indicates a need. The following definitions where used in the development of the NS Mayport APZ composite (Navy 1982):

- For fixed-wing runways, DoD has two classes of runways (Class A and Class B) for the purpose of defining APZs. All runways at NS Mayport are **Class B**, which are for use by heavy or high-performance aircraft. Three areas beyond the runway primary surface are APZs designated as: the Clear Zone, APZ 1, and APZ 2 (Figure 5-1).

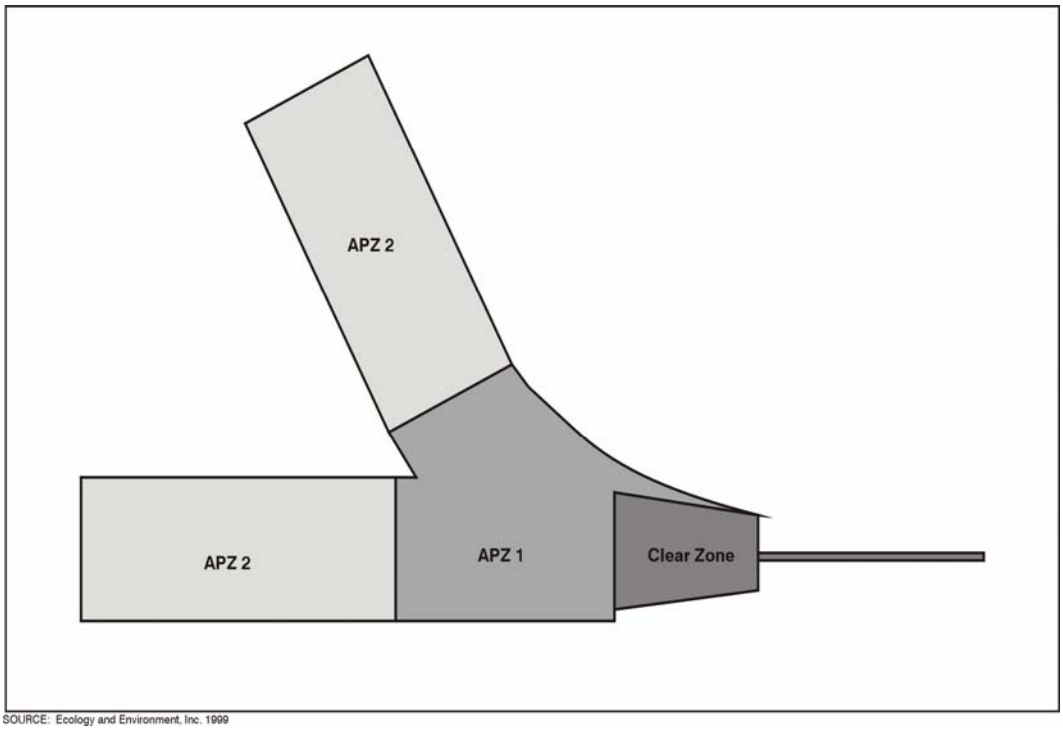


SOURCE: Ecology and Environment, Inc. 1999

Figure 5-1 Standard Accident Potential Zones

- The **Primary Surface** is a surface on the ground or water centered lengthwise on the runway and extending 200 feet beyond each end of the runway. The width of the Primary Surface for a Class B built prior to 1981 shall be 1,500 feet.
- The **Clear Zone** extends 3,000 feet immediately beyond the runway and has the highest potential for accidents. It measures 1,500 feet wide at the end of the runway and 2,284 feet wide at its outer edge. A Clear Zone is required for all active runways. Typically, DoD has acquired the Clear Zone area in fee, or by restrictive easement to keep it clear of obstructions.
- **APZ 1** extends 5,000 feet beyond the Clear Zone with a width of 3,000 feet. APZ 1 is typically rectangular; however, when circumstances warrant, the APZ may be curved to correspond with predominant flight tracks. An APZ 1 area is provided for flight tracks that experience 5,000 or more annual operations (departures or approaches).
- **APZ 2** extends 7,000 feet beyond APZ 1 (or the Clear Zone if APZ1 is not used) with a width of 3,000 feet. An accident is more likely to occur in APZ 1 than APZ 2 and more likely to occur in the Clear Zone than in either APZ 1 or APZ 2. APZ 2 area is designated whenever APZ 1 is required. If APZ 1 is not warranted, the APZ 2 may still be used if an analysis of operations and/or accidents indicates a need for it. Like APZ 1, the geometric configuration of APZ 2 may also be curved. When FCLP is an active aspect of aircraft operations at an installation, APZ 2 extends the entire FCLP track beyond APZ 1.

APZs extend from the end of the runway, but apply to the predominant arrival and departure flight tracks used by the aircraft. Therefore, if an airfield has more than one predominant flight track to or from the runway, APZs can extend in the direction of each flight track (Figure 5-2).



SOURCE: Ecology and Environment, Inc. 1999

Figure 5-2 Accident Potential Zones With More Than One Predominant Flight Track

The DoD has implemented special APZ guidelines for helicopter operations:

VFR
visual flight rules

- **Primary Surface.** A horizontal plane centered on the helicopter runway and/or helipads. The primary surface dimensions for visual flight rules (VFR) runways are the length of the runway plus 75 feet at each end, and a width of 300 feet (or 150 feet beyond a helipad).
- **Clear Zone.** The takeoff safety zone for VFR helicopters facilities shall be used as the Clear Zone. The takeoff safety zone is that area under the VFR approach/departure surface until that surface is 50 feet above the established landing area elevation.
- **APZ 1.** An area beyond the Clear Zone for the remainder of the approach/departure zone, which is that area under the

VFR approach/departure surface until that surface is 150 feet above the established landing area elevation.

The AICUZ Program provides recommendations for compatible land use within each APZ. Within the Clear Zone, most land uses are incompatible with military aircraft operations. For this reason, it is the Navy's policy to acquire sufficient real property interests in land within the Clear Zone to ensure that incompatible development does not occur. Within APZ 1 and APZ 2, a variety of land uses are compatible; however, people-intensive uses (e.g., schools, stadiums, etc.) should be restricted because of the greater risk in these areas. When events resulting in threats to the operational integrity from incompatible development (encroachment) occur, and when the local communities are unwilling or unable to take the initiative on combating the threat via their own authority, consideration will be given by the Navy to land acquisition with priority to clear zones and secondary priority to APZs (Navy 2002). Outside the Clear Zone, APZ 1, and APZ 2, the risk of aircraft accidents is not significant enough to warrant special consideration in land use planning.

At NS Mayport, the Navy has acquired a number of parcels within the Clear Zone and APZ corridor to ensure the compatibility of surrounding land uses. The APZs based on fixed-wing operations for NS Mayport are shown on Figure 5-3. The APZs based on helicopter operations are shown on Figure 5-4. Even though the fixed-wing aircraft operations at NS Mayport are limited, the fixed-wing APZs cover a much larger area than helicopter APZs and are, therefore, dominant. The composite 2006 APZs shown on Figure 5-5 were generated as a result of 2003 flight operations. The 2006 APZs represent all active flight tracks that warrant APZs. Figure 5-6 compares the existing 1976 APZs with the 2006 APZs prepared for this AICUZ update. (The 1976 APZs are named A, B, and C, which are comparable to today's designation of Clear Zone, APZ 1, and APZ 2). The total area included within the APZs is presented in Table 5-1. Lands within the 2006 APZs decreased by approximately 1,484 total acres from the 1976 AICUZ update. The decrease in the area of the APZs is attributed to the reduction in fixed-wing operations.

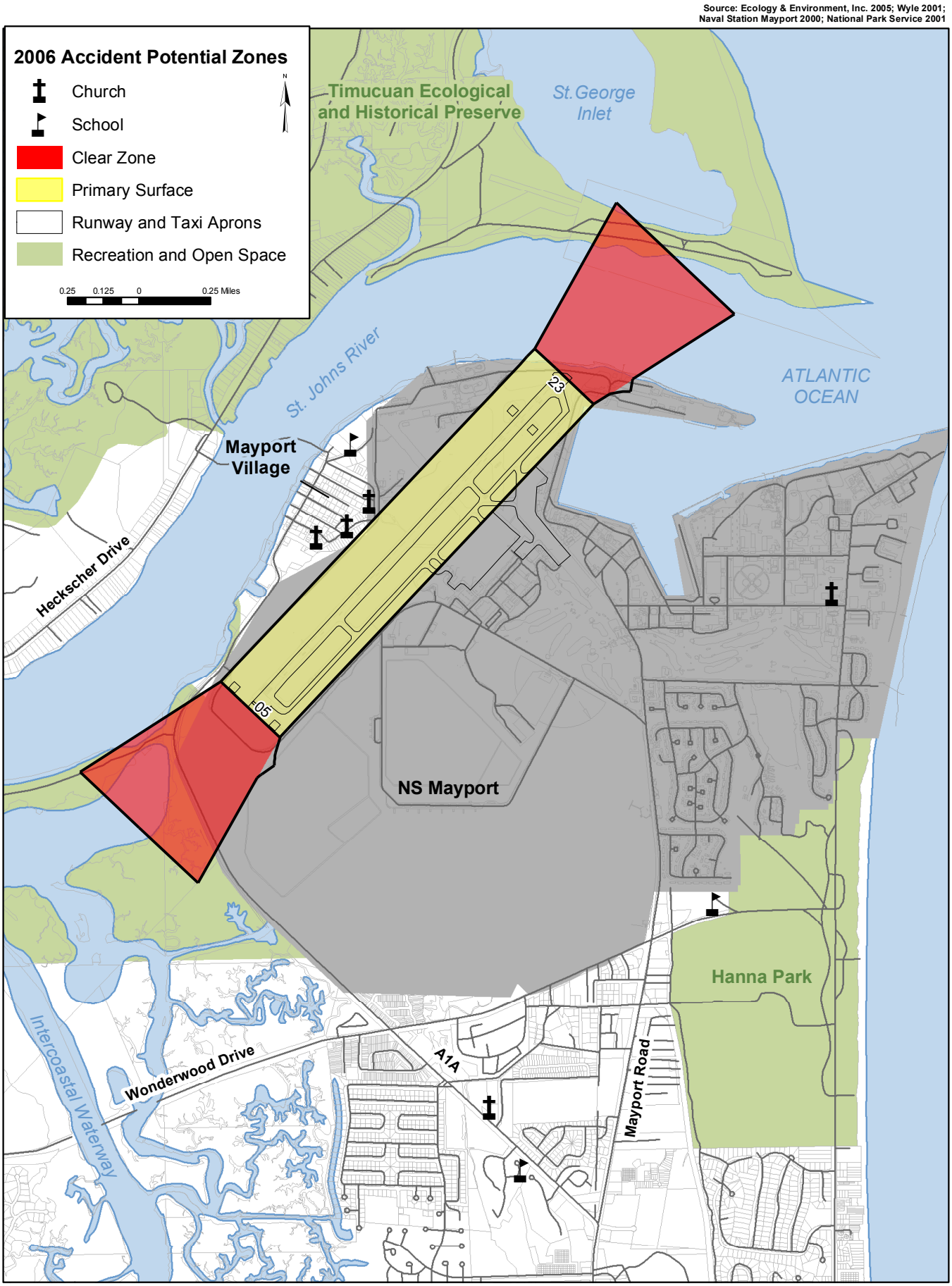


Figure 5-3
2006 Fixed-Wing APZs
NS Mayport

Source: Ecology & Environment, Inc., 2005; Wyle 2001; National Park Service 2001

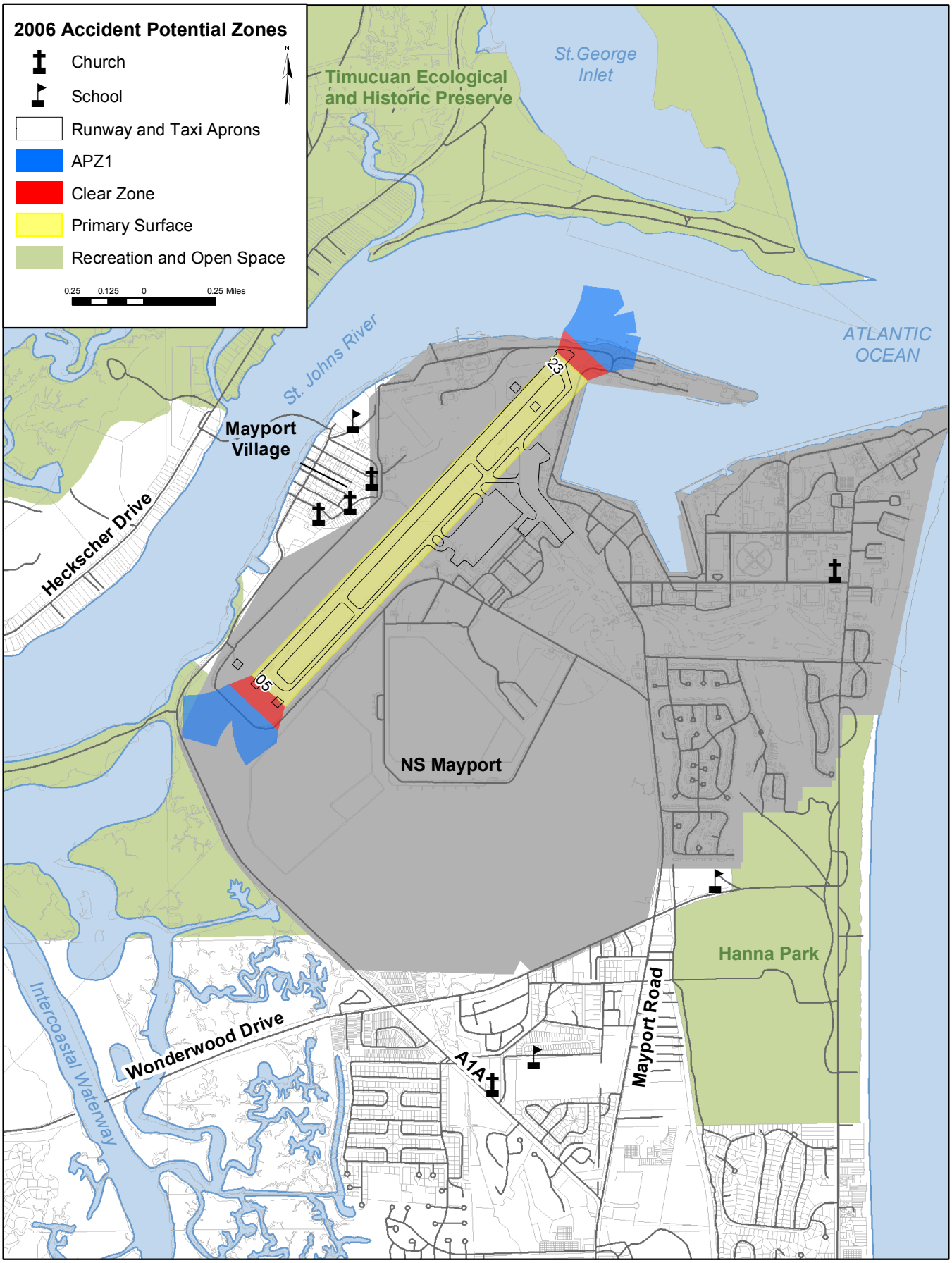


Figure 5-4
2006 Helicopter APZs
NS Mayport

Source: Ecology & Environment, Inc., 2001; Wyle 2001; Naval Station Mayport 2000; National Park Service 2001

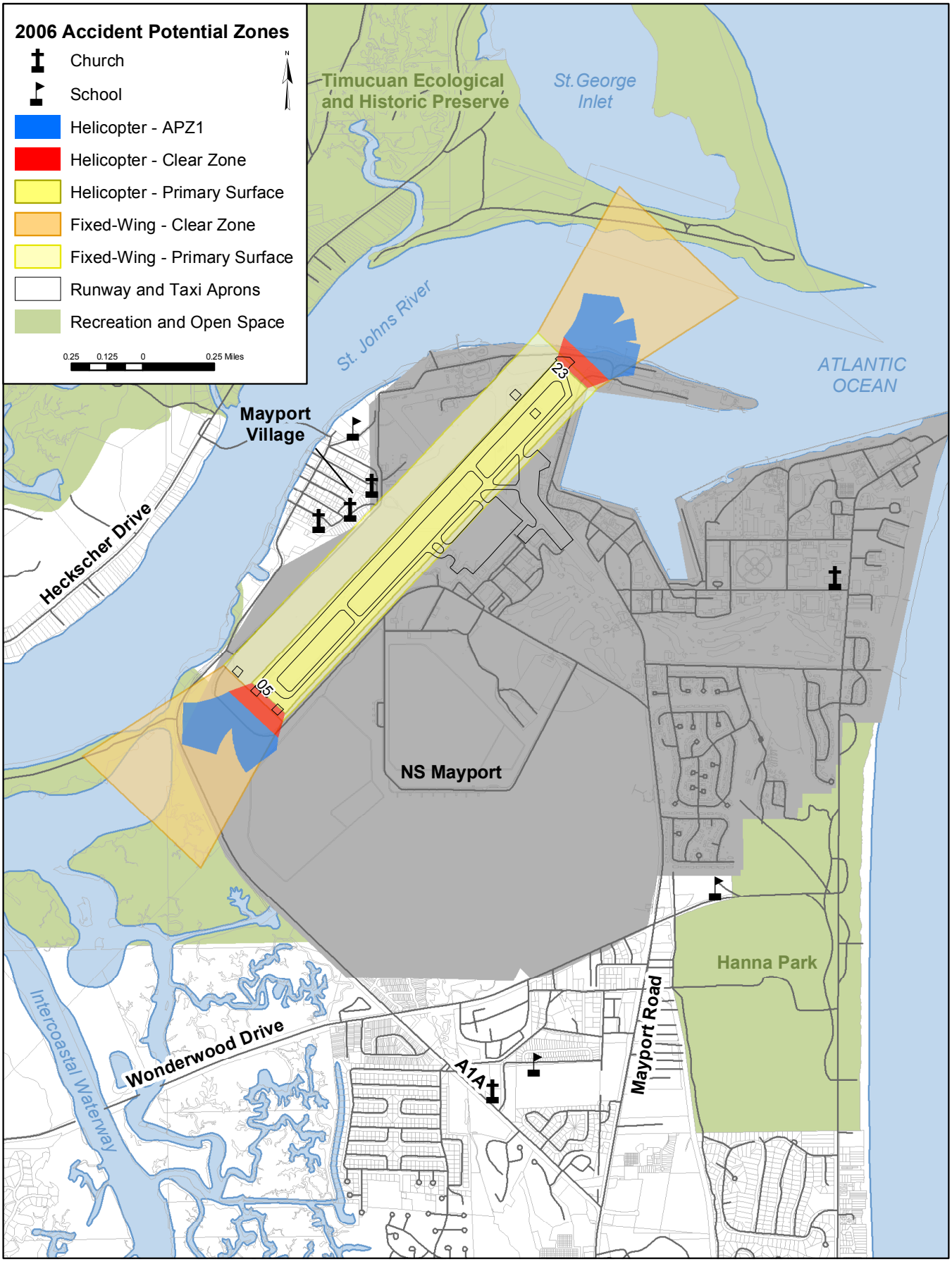


Figure 5-5
2006 Composite APZs
Fixed-Wing and Helicopter Operations
NS Mayport

Source: Ecology & Environment, Inc. 2005; Wyle 2001; Navy 1976; National Park Service 2001

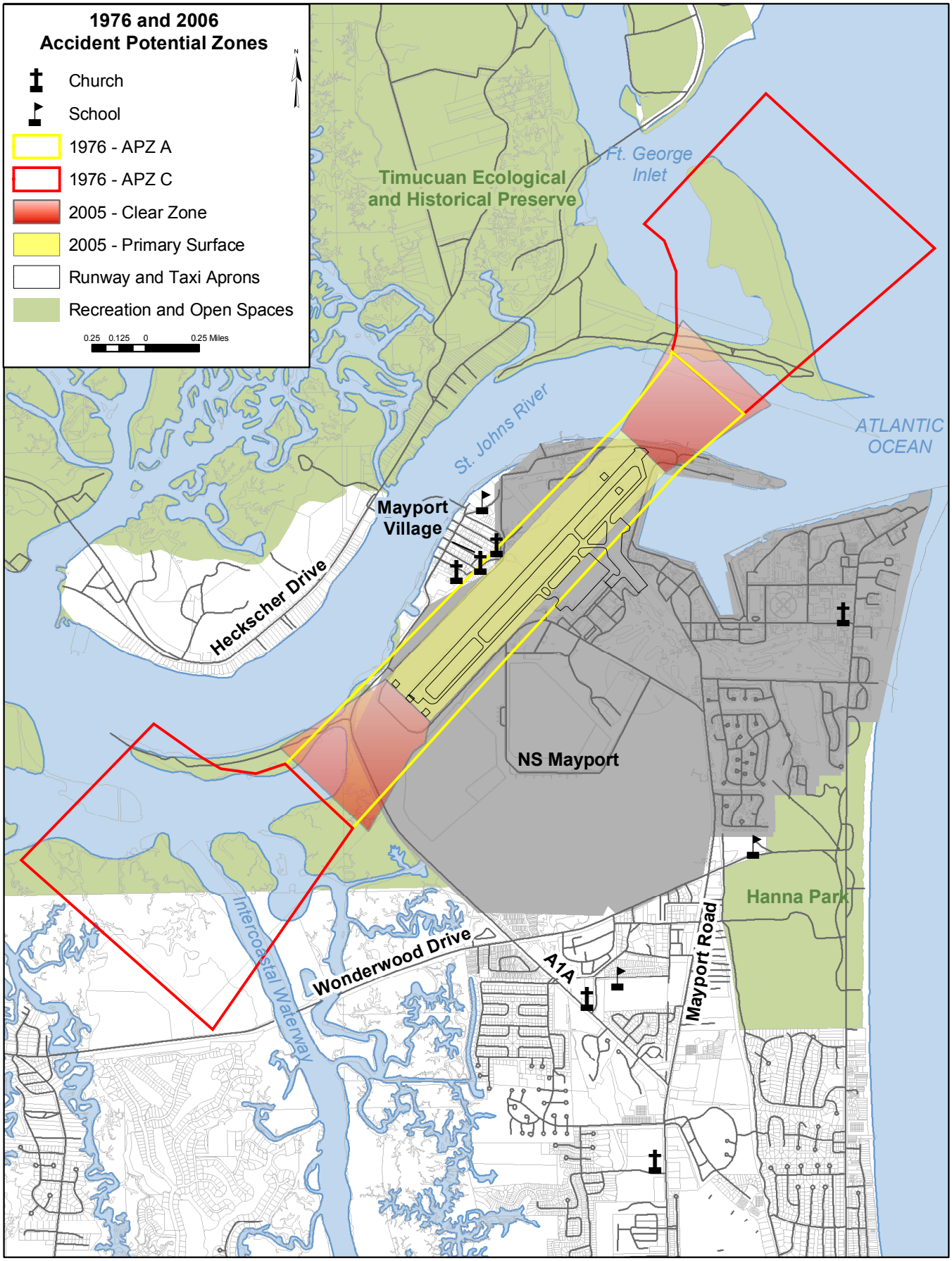


Figure 5-6
Comparison between 1976 and 2006 APZs
NS Mayport

Table 5-1
Land Area within Accident Potential Zones (1976 and 2006)
Naval Station Mayport, Florida

Year	Primary Surface (acres)	Clear Zone (acres)	APZ 1 (acres)	Total Area (acres)
1976 APZs	N/A	662	1,413	2,075
2005 APZs	291	300	0	591

Source: Navy 1976; Wyle 2005; Ecology & Environment, Inc. 2005a.
Key:
APZ = Accident potential zone.

5.2 Flight Safety

5.2.1 Aircraft Mishaps

Aircraft Safety
In the past 18 years, the only Class A mishap at NS Mayport occurred in March of 2004 when a SH-60 helicopter turned on its side during landing.

A key indicator of aircraft safety is associated with the number of Class A aircraft mishaps that occur at an airfield. Class A mishaps are typically associated with either a loss of life, loss of an aircraft, or damage costs in excess of $1 million as a result of the mishap. In the past 18 years, the only Class A mishap at NS Mayport occurred in March of 2004 when a SH-60 helicopter turned on its side during landing. The only other aircraft operations-related accident at NS Mayport was the crash of a T-45 trainer in 1997 when it turned over on the runway. No civilians were involved in either accident.

5.2.2 Imaginary Surfaces

Imaginary planes and transition surfaces define the required airspace that must remain free of obstructions to ensure safe flight approaches, departures, and patterns. Obstructions may include natural terrain and manmade features such as buildings, towers, poles, and other vertical obstructions to airspace navigation. A brief description of the imaginary surfaces for fixed-wing runways is provided in Table 5-2. These imaginary surfaces are shown in Figure 5-7, and specifically for NS Mayport in Figure 5-8. While imaginary surfaces exist for helicopters, they fall completely within the imaginary surfaces defined for fixed-wing aircraft that are presented in this study (Figure 5-8).

Table 5-2 Imaginary Surfaces – Class B Fixed-wing Runways	
Planes and Surfaces	**Geographical Dimensions**
Primary surface	A 1,500-foot-wide plane centered over the runway and extending 200 feet beyond the end of the runway.
Clear Zone	A trapezoidal area 3,000 feet beyond the end of the runway, measuring 1,500 feet wide at the runway and 2,284 feet wide at its outer edge.
Approach-departure clearance surface (glide angle: 50:1)	An inclined plane extending at a 50:1 angle (i.e., one vertical foot for every 50 horizontal feet), from the end of the primary surface to an elevation of 500 feet above the airfield.
Approach-departure clearance surface (horizontal)	A horizontal surface extending from the 500-foot elevation of the glide angle for a distance of 50,000 feet from the point of origin.
Inner horizontal surface	An oval-shaped plane 150 feet above the runway, extending in a 7,500-foot radius from the centerline of the end of each runway.
Conical surface	A conical surface extending 7,000 feet from the periphery of the inner horizontal surface at a 20:1 slope (i.e., one vertical foot for every 20 horizontal feet) to an elevation of 500 feet above the airfield.
Outer horizontal surface	An oval-shaped plane 500 feet above the runway, extending 30,000 feet beyond the periphery of the conical surface.
Transitional surface	An inclined plane that connects the primary surface and the approach-departure clearance surface to the inner horizontal surface, conical surface and outer horizontal surface.
Source: Navy 1981.	

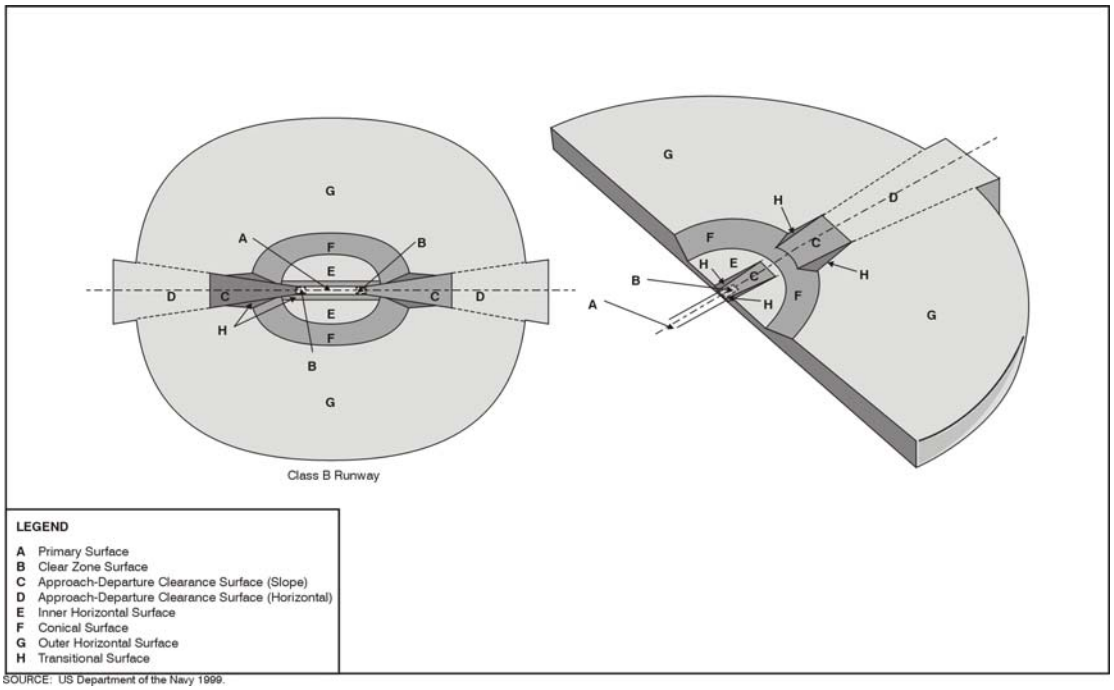


Figure 5-7 Imaginary Surfaces and Transition Planes for Class B Fixed-Wing Runways

Source: Ecology & Environment, Inc. 2005; Wyle 2001; Naval Station Mayport 2000; National Park Service 2001

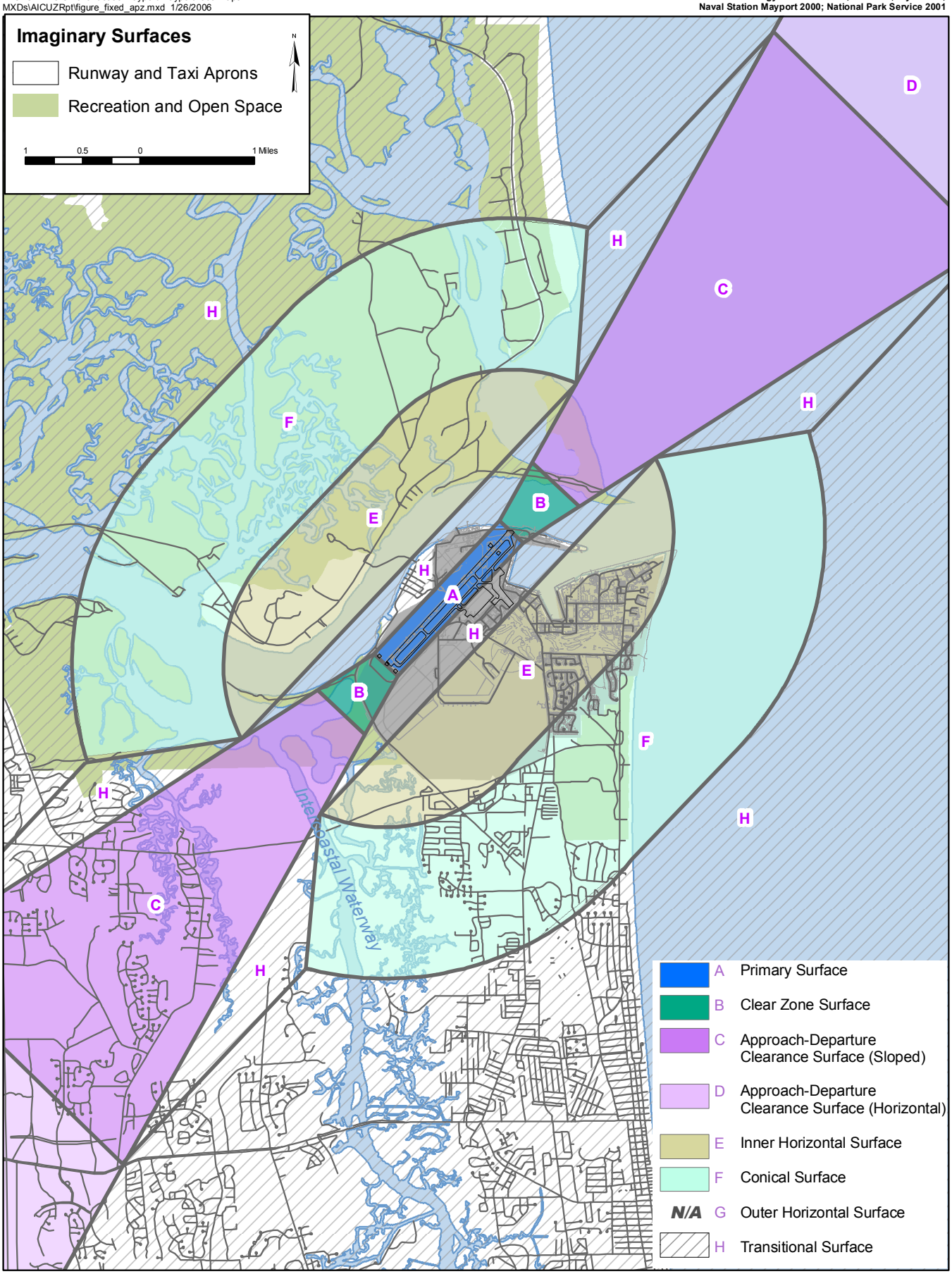


Figure 5-8
Imaginary Surfaces for
NS Mayport

5.2.3 Bird/Animal Aircraft Strike Hazard

Wildlife represents a significant hazard to flight operations. Birds, in particular, are drawn to the open, grassy areas and warm pavement of the airfield. Although most bird and animal strikes do not result in crashes, they can result in expensive structural and mechanical damage to aircraft. Most collisions occur when the aircraft is at an elevation less than 1,000 feet. Due to the speed of the aircraft, collisions with wildlife can happen with considerable force.

To reduce the hazards of bird and animal strikes, the FAA and the military recommend that certain land uses that attract birds be located at least 10,000 feet from the airfield. These land uses include:

- Waste disposal operations;
- Wastewater treatment facilities;
- Landfills;
- Golf courses;
- Wetlands;
- Dredge disposal sites;
- Seafood processing plants; and
- Stormwater ponds.

Design modifications also can be used to reduce the attractiveness of these types of land uses to birds and other wildlife.

BASH
bird/animal aircraft strike hazard

NS Mayport operates under a bird/animal aircraft strike hazard (BASH) awareness program. The policy and guidelines of the program are established in Air Station Order 3750.6. The program encompasses all actions that may identify, reduce, or eliminate bird or other animal hazards to aviation on NS Mayport. The plan also includes actions by Installation personnel that are designed to reduce BASH problems off the Installation in coordination with other federal and state agencies and the general public, as necessary. The BASH plan for NS Mayport is designed to:

- Assign responsibilities to individuals, groups, and departments for carrying parts of the plan;

- Establish procedures to identify high hazard situations and bird/animal watch conditions;
- Establish aircraft and airfield operating procedures to avoid high hazard situations;
- Establish guidelines to decrease the attractiveness of the airfield and nearby areas to birds; and
- Provide guidelines for dispersing birds when they occur on the airfield.

5.2.4 Electromagnetic Interference

New generations of military aircraft are highly dependent on complex electronic systems to perform critical flight- and mission-related functions. This dependence on digital electronics, combined with higher clock rates, power-conserving signal levels, increased use of composite materials, onboard radar, communications transmitters, and lasers, increases the susceptibility of aircraft communication, navigation, and other electrical systems to EMI. EMI is defined by the American National Standards Institute as any electromagnetic disturbance that interrupts, obstructs, or otherwise degrades or limits the effective performance of electronics/electrical equipment. It can be induced intentionally, as in forms of electronic warfare, or unintentionally, as a result of spurious emissions and responses, such as high tension line leakage. Additionally, EMI may be caused by atmospheric phenomena, such as lightning and precipitation static, and by non-telecommunication equipment, such as vehicles and industry machinery.

5.2.5 Lighting

Bright lights, either direct or reflected, in the airfield vicinity can impair a pilot's vision, especially at night. A sudden flash from a bright light causes a spot or "halo" to remain at the center of the visual field for a few seconds or more, rendering a person virtually blind to all other visual input. This is particularly dangerous at night when the flash can destroy the eye's adaptation to darkness, typically requiring 40 to 45 minutes for partial recovery.

5.2.6 Smoke, Dust, and Steam

Industrial or agricultural sources of smoke, dust, and steam in the airfield vicinity could obstruct the pilot's vision during takeoff, landing, or other periods of low altitude flight.

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6 Land Use Compatibility Analysis

AICUZ Map
Defines minimum recommended, acceptable area within which land use controls are needed to protect the health, safety, and welfare of those living near a military airfield, and to preserve the defense flying mission.

The APZs and noise zones comprise the AICUZ map or "footprint" for an air installation. The AICUZ map defines the minimum recommended, acceptable area within which land use controls are needed to protect the health, safety, and welfare of those living near a military airfield, and to preserve the defense flying mission. The AICUZ map and the information derived from the map are the fundamental tools necessary for the AICUZ planning process.

The information presented in this section of the AICUZ update is intended for consideration by the Installation, government entities such as Jacksonville/Duval County, the communities of Atlantic, Neptune, and Jacksonville Beach, and the Village of Mayport, as well as other interested groups and participating agencies. The intent of the AICUZ Program is to use AICUZ data in the community planning context to achieve the following objectives:

- To encourage cooperative land use planning between the Installation and the community so that future growth and development are compatible with the operational mission of the Installation; and
- To seek ways to reduce the operational impacts on adjacent land (Navy 2002).

Although ultimate control over land use and development in the vicinity of military facilities is the responsibility of local governments, it is through information, such as this AICUZ report, that the DoD encourages localities to adopt programs, policies, and regulations that promote compatible development, where appropriate and feasible, near military facilities.

This section addresses land use compatibility within aircraft noise zones and APZs by examining existing and planned land uses near NS Mayport. This section begins with a description of the existing land use and growth indicators, and the local programs, policies, and regulations used to promote compatible development in the AICUZ. A land use compatibility assessment follows the background discussion.

6.1 Land Use and Development Control

6.1.1 Existing Land Use and Regional Growth

NS Mayport is located in Duval County, Florida, near the confluence of the St. Johns River and the Atlantic Ocean, approximately 15 miles east of downtown Jacksonville. Duval County, which lies along the northeast coast of Florida, is bordered by Nassau County to the north, Baker County to the west, Clay and St. Johns Counties to the south, and the Atlantic Ocean to the east. The Atlantic Ocean and the St. Johns River are east and north, respectively, of NS Mayport. Salt marsh and wetland communities are located southwest and west of the Installation. Land use around NS Mayport is shown on Figures 6-1 and 6-2.

The City of Jacksonville's 2010 Comprehensive Plan and associated land development regulations (i.e., zoning regulations) guide future development/land use in the City of Jacksonville as mandated by the State of Florida's Local Government Comprehensive Planning and Land Development Act, Chapter 163, Part II, Florida Statutes.

The community of Mayport is situated on a narrow strip of land along the St. Johns River, northwest of NS Mayport between Chicopit Bay and the ferry boat station. The community of Mayport is predominantly comprised of low-density residential and commercial uses (approximately 50% of the community is residential and 50% is commercial). The low-density residential use is characterized by allowing up to seven units per acre, but the majority is comprised of five units per acre (Lukacovic 2006). The commercial use is zoned as

Source: Wyle 2005; Jacksonville Planning Department 2001; National Park Service 2001

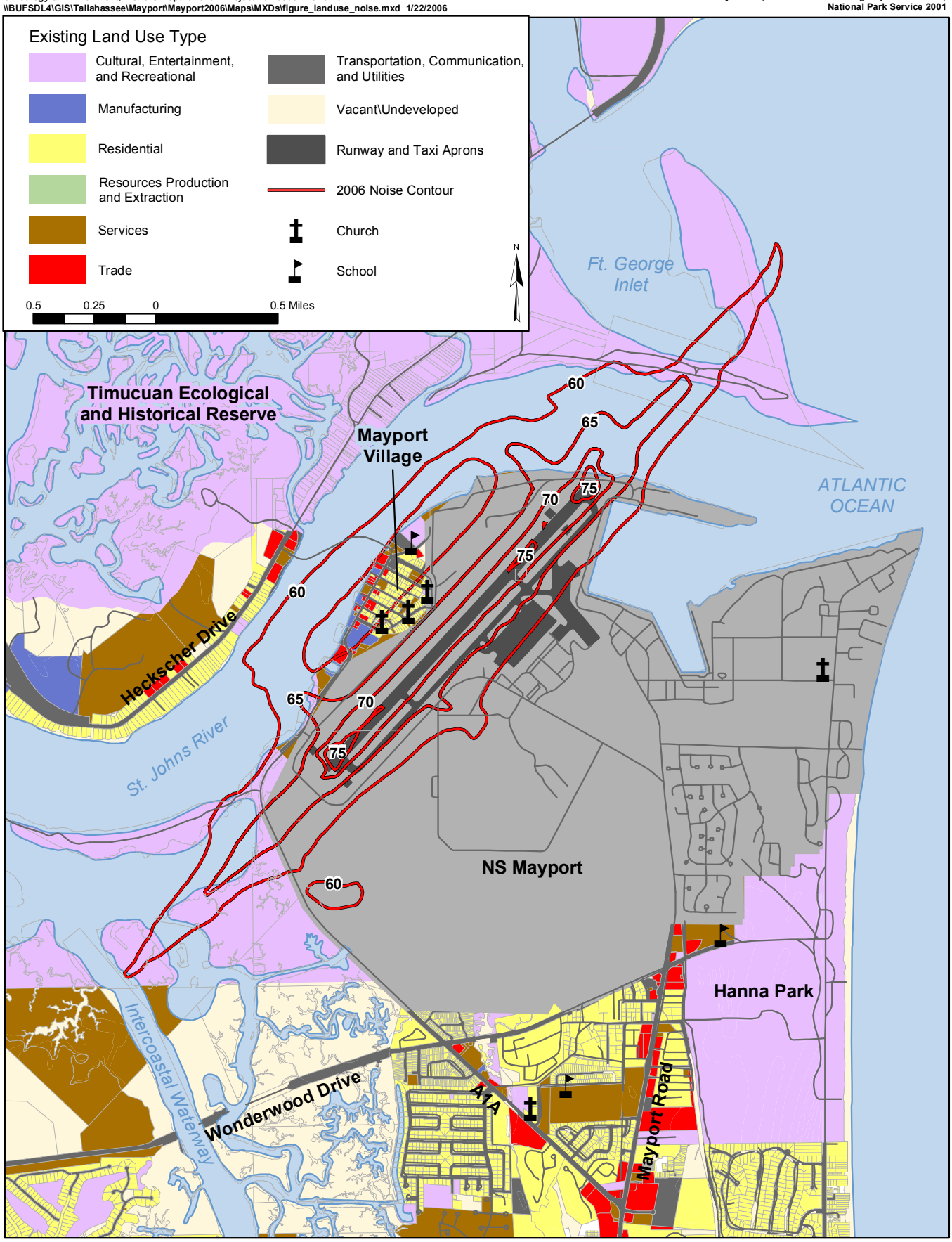

Figure 6-1
Existing Land Use and 2006 Noise Contours
NS Mayport

02:000822-SZ02-02 Figure_landuse_apz2006.mxd 30/05/2006 -GIS
Source: Wyle 2005; Jacksonville Planning Department 2001;
National Park Service 2001

Source: Wyle 2005; Jacksonville Planning Department 2001;
National Park Service 2001

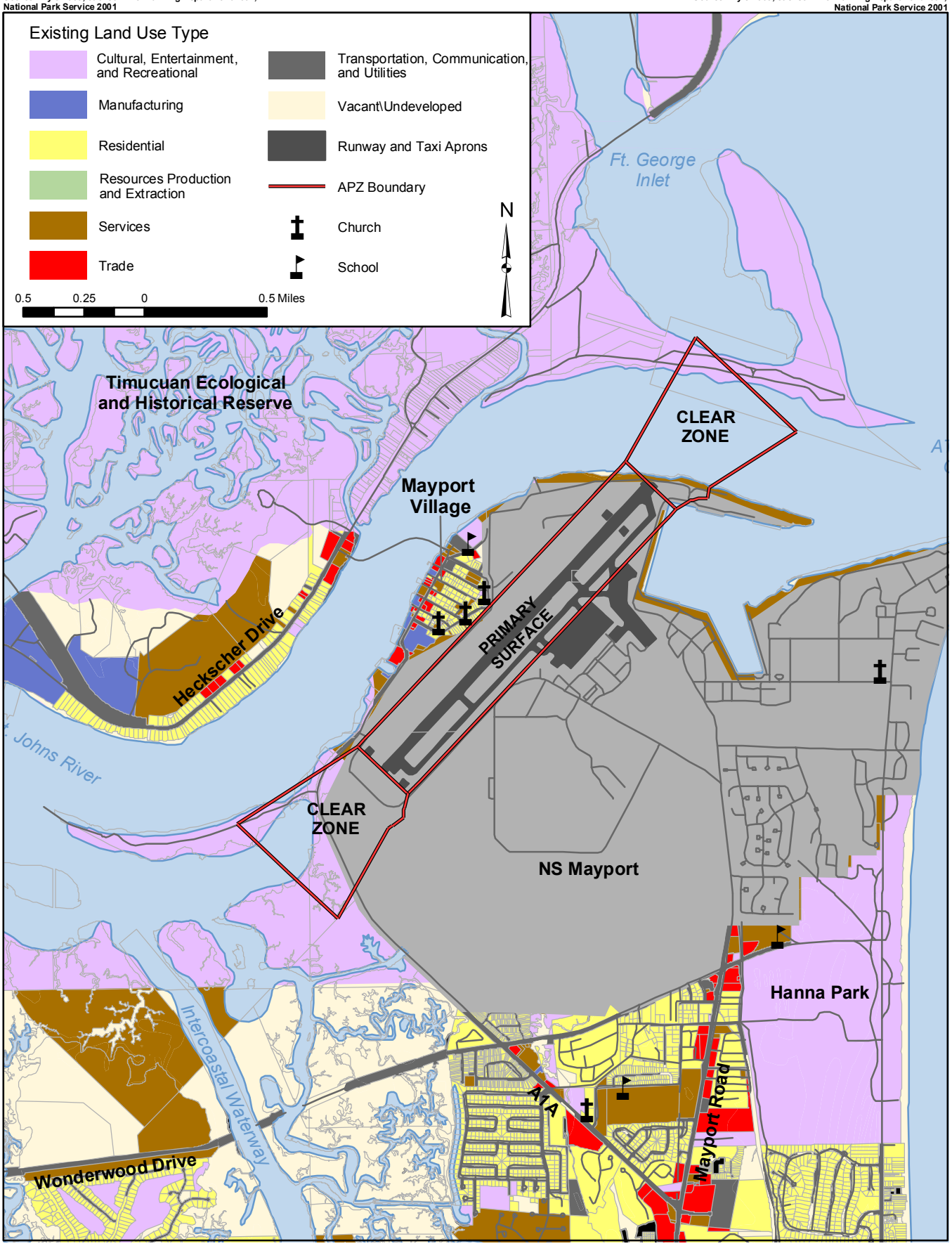

Figure 6-2
Existing Land Use and 2006 APZs
NS Mayport

medium-density, which allows up to 20 units per acre; however, there is no medium-density existing there currently. Medium-density commercial is anticipated in the future as the City of Jacksonville continues to develop (Lukacovic 2006).

The southern edge of NS Mayport is bordered by State Route SR A1A, Wonderwood Drive, and Kathryn Abbey Hanna Park. Huguenot Park, Little Talbot Island Park, and Fort George Island are north of the St. Johns River. Land uses along the boundaries of the Installation generally provide good buffers between NS Mayport and surrounding communities. Commercial development around NS Mayport is located primarily in the community of Mayport, along SR A1A, and south of the naval complex along Mayport Road. The area around the Installation is part of the beach communities of Atlantic, Neptune, and Jacksonville Beach. The predominant development trends are toward infill along the major arterial roadways. The remainder of the area is almost built out, or is covered by tidal salt marsh. Construction has been completed on the Wonderwood Connector, a limited-access divided highway that connects the Mayport area directly with the City of Jacksonville. The major implication of this divided highway on the area has been in changed traffic patterns for the area (Lukacovic 2006).

Existing land use at NS Mayport is the result of planned incremental development of facilities during station operation. In general, administration, maintenance, and repair functions are located adjacent to the waterfront, providing a logical grouping of activities around the ships and turning basin. The 8,000-foot runway and airfield operations lie to the west of the turning basin between the harbor operations and the community of Mayport. Housing and community facilities are separated from the industrial areas by the roadway network, administration facilities, and the golf course.

Next to port operations, air operations constitutes one of the largest land use activities at NS Mayport, consisting of Runway 05/23, parking aprons, taxiways, clear zones and APZs. Air operations influence and define other land use activities at the Station, which include administration, community and medical facilities, recreation, family and

troop housing, supply/storage, training, ordnance storage, and maintenance/utilities. All development on-station has occurred east of the airfield.

Jacksonville/Duval County Population and Growth Trends

The City of Jacksonville is divided into six planning districts; the NS Mayport area is located in the Greater Arlington Planning District. The Greater Arlington Planning District was the second most-populated district in the county in 2000, with a population of 186,072 (City of Jacksonville Department of Planning and Development 2005). The 2000 population represents a 26% increase in population (38,145 people) since 1990.

The City of Jacksonville Department of Planning and Development generated population projections for Duval County and the six planning districts that comprise the City of Jacksonville (Table 6-1). NS Mayport falls within the Greater Arlington Planning District. Table 6-2 provides additional information on estimated changes in population within the District in recent years.

Table 6-1
Population of Duval County,
City of Jacksonville and Greater Arlington Planning District Population Projections

Population Area	1990	2000	2005	2010	2015	2020
Duval County	672,971	778,879	589,361	910,562	962,943	1,013,469
City of Jacksonville	635,230	735,617	819,210	869,704	921,922	973,104
Greater Arlington Planning District	147,927	186,072	205,341	217,757	231,052	243,609

Source: City of Jacksonville Department of Planning and Development 2005.

Table 6-2
Greater Arlington Planning District Population Estimates

	2003	2004	Annual	% Change
Population	197,579	201,062	3,483	1.8
	2004	**2005**	**Annual**	**% Change**
Population	201,062	205,341	4,279	2.1

Source: City of Jacksonville Department of Planning and Development 2005.

Growth in the NS Mayport vicinity has been extensive, especially to the west of the Installation (Salem 2006). Growth patterns in the NS Mayport area can be further illustrated by the residential building statistics for the area. In 2004, a total of 9,574 residential units

were permitted in Jacksonville, the majority being for single-family units (City of Jacksonville Department of Planning and Development 2005). The Greater Arlington Planning District accounted for 13% of the total permitted units. An analysis of trends and a comparison with recent historical data indicate that the total amount of new residential units during 2004 was an increase of 16% over residential development in 2003. Growth in the Greater Arlington Planning Area remained fairly constant, with little or no growth from 2003 to 2004.

In terms of new developments occurring or proposed near the Installation, none are currently proposed within the existing AICUZ (Lukacovic 2006). However, a mixed-use development (commercial uses and condominiums) has been proposed for Mayport Village, located outside the existing AICUZ. It will be located near the U.S. Coast Guard base at the southern portion of the village, near the river. Roughly four or five parcels would be developed; the condominiums would be located on the larger parcel of the group (Lukacovic 2006). The developer for the project has only spoken in generalities about the project, but has indicated that 80 units could be the target number for condominiums (Lukacovic 2006).

Airport Environ Zone Acknowledgement
A notice that must be filed upon sale, lease, transfer, development, application for zoning or land use change, or subdivision or platting of property within the Notice Zones which indicates that the property is located in the vicinity of an airport and may be subjected to significant noise levels and/or accident potentials and/or lighting regulations due to the airport operations.

The project would be developed using conventional zoning; therefore, no rezoning for the affected parcels would be necessary. There is some concern that if the existing AICUZ area is expanded outward in the future, the parcel of land on which the condominiums are to be developed could be within the AICUZ (Lukacovic 2006). Prospective buyers of the condominiums would not necessarily be aware of the ambient noise from the Installation, as that area is not currently covered under the notice requirement for the Airport Environ Zone Acknowledgement.

Economy and Employment

As of January 2005, nearly 90% of the non-agricultural labor force was employed in the service-producing sector of the local economy. The Jacksonville Metropolitan Statistical Area unemployment rate was 5.2% for 2004, slightly higher than the overall rate for the state

of Florida of 4.1% (City of Jacksonville Department of Planning and Development 2005). The Navy and the Duval County Public Schools are the top two employers in Jacksonville. NS Mayport employs 16,246 employees and the Duval County Public Schools employ 15,000 (City of Jacksonville Department of Planning and Development 2005). The per capita income for Jacksonville in 2003 was just under $34,000.

Economic Impact
NS Mayport provides a significant economic contribution to the City of Jacksonville, with a total economic impact of approximately $1.8 billion annually.

NS Mayport provides a significant economic contribution to the City of Jacksonville. As of January 2004, the military/civilian payroll was $638.7 million and $200 million worth of goods and services were purchased in the local economy (Austin 2006). The total economic impact of NS Mayport is approximately $1.8 billion. This number was derived by the following formula (Austin 2006):

Payroll X 2.5 (economic multiplier) + Goods and Services

There are also 41,897 DoD retirees and Survivor Benefits recipients with a payroll of $857 million in the greater Jacksonville area.

6.1.2 Planning Authority

NS Mayport and its AICUZ footprint lie entirely within the incorporated area of Jacksonville/Duval County. The 2010 Comprehensive Plan for Jacksonville/Duval County is the primary public policy document forming the basis for any future land use ordinances. Its intent is to encourage the most appropriate use of land, water, and resources consistent with the public interest, to overcome present limitations and deal effectively with future problems that may result from the use and development of land within the city. The body of the plan discusses existing conditions, develops future goals/objectives, and recommends implementation strategies for such issues as:

- Future land use;
- Natural resources and water quality;
- Cultural resources;
- Affordable housing;
- Parks, recreation, and open space;

- Community facilities;
- Transportation; and
- The economy.

The comprehensive plan implements its goals and objectives through a set of land development regulations. Jacksonville/Duval County adopted an AICUZ ordinance to its comprehensive zoning regulation in 1991: Zoning and Development Standards, Ordinance 91-59-148. The zoning regulation is currently being updated for 2006.

Chapter 656, Part 10 of the updated draft zoning code addresses elements of the AICUZ Program, as well as FAA regulations. The AICUZ ordinance was established to protect future development from the effects of aircraft noise and accident potential, and to prevent obstruction to air navigation. The regulations that appear in Part 10 apply to all land within the delineated airport noise zones, APZs, clear zones, runway safety areas, runway protection zones, and airspace height and hazard zones. These regulations override and supersede other regulations in the zoning code.

6.2 Land Use Compatibility Guidelines and Classifications

The Navy has developed land use compatibility recommendations for APZs and noise zones. These recommendations, which are found in OPNAVINST 11010.36B, Air Installations Compatible Use Zones Program (Navy 2002), are intended to serve as guidelines for both the placement of APZs and noise zones, and the development of land uses around military air installations. The guidelines assume that noise-sensitive land uses (e.g., houses, churches, amphitheaters) will be placed outside high-noise zones and that people-intensive uses (e.g., regional shopping malls, theaters) will not be placed in APZs. Certain land uses are considered incompatible with APZs and high-noise zones, while other land uses may be considered compatible, or conditionally compatible (i.e., compatible under certain conditions). The land use compatibility analysis conducted for NS Mayport was

based on the Navy's land use compatibility recommendations and are presented in Appendix B. To determine land use compatibility within NS Mayport noise zones and APZs, the Navy examined both existing and planned land uses near the Installation.

6.2.1 Existing Land Use Data

The Jacksonville/Duval County Planning and Development Department was the primary source for existing land use information and associated data for determining land use compatibility within noise zones and APZs associated with NS Mayport (Killingsworth 2005). The information obtained from the department's database is current through late 2004.

FLUCC
Florida Land Use Classification Code

Within the County's database, each parcel of land in the county is classified using the Florida Land Use Classification Code (FLUCC). The FLUCC is a four-digit land use coding system for existing land use in Duval County. Based on the existing land use(s), a four-digit number has been assigned to each parcel of land in the county. Each number in the FLUCC classification can be equated to a corresponding number and associated land use categories of the Standard Land Use Coding Manual (SLUCM). OPNAVINST 11010.36B suggests the use of the SLUCM as guidance for determining land use compatibility for noise and APZs. Like the FLUCC, the SLUCM relies on a two- to four-digit land use coding system. In many cases, the land use categories and identification numbers in the county's FLUCC varied from the SLUCM. In most of these instances, the variation was a result of the county expanding upon the number of SLUCM land use categories, or choosing slightly different land use classification names. In a few cases, where SLUCM distinguishes among land use categories by adding decimal places to the numbers, the County combined the categories into one FLUCC number. Table 6-3 presents a composite of the Navy's land use compatibility recommendations for noise zones and APZs. The complete table of Land Use Compatibility Guidance can be found in Appendix B.

SLUCM
Standard Land Use Coding Manual

Table 6-3
Land Use Compatibility Recommendations

	Land Use Compatibility Noise Zone (DNL)			Land Use Compatibility With APZs		
	65-70	70-75	75-80	Clear Zone	APZ 1	APZ 2
Single-family residential						
Multi-family residential						
Assembly areas, churches, auditoriums						
Schools						
Office, retail						
Manufacturing/Industrial						
Outdoor parks and recreation						

Key:
APZ = Accident potential zone.
DNL = Day-night average sound level.
Compatible
Conditionally Compatible
Incompatible

GIS
Geographic Information System

For each land use activity assigned a FLUCC number in the County's database that is not reported in the SLUCM system, the Navy conducted a similarity analysis. In order to use the unreported FLUCC land use categories in the Geographic Information Systems (GIS) data analysis, the unreported FLUCC land use activity was given the land use compatibility ratings for noise and APZs of the SLUCM land use category it most closely matched and incorporated into the Navy land use compatibility guidance.

Table 6-4 shows existing land use classifications and the SLUCM numbers associated with each land use classification.

Table 6-4
SLUCM Numbers and Land Use Classifications

SLUCM Land Use Classification	SLUCM Numbers
Residential	11 through 19
Manufacturing	20 through 29, 31 through 35, and 39
Transportation, Communication, and Utilities	40 through 49
Trade	36, 37, 38, 50 through 59
Service	30, 60 through 69
Cultural, Entertainment, and Recreation	10, 70 through 80
Resources Production and Extraction	81 through 85, and 89
Vacant/Undeveloped	91, FLUCC #'s: 9500 ,9600, 9900

Key:
SLUCM = Standard Land Use Coding Manual.
FLUCC = Florida Land Use Classification Code.

6.3 Land Use Compatibility Assessment

To determine whether existing land use is compatible with aircraft operations at NS Mayport, the 2006 noise zones and APZs were overlaid on Jacksonville/Duval County's existing land use map (Figures 6-1 and 6-2, respectively), and existing land uses were compared to the land use compatibility recommendations shown in Table 6-4. Figure 6-3 shows areas of compatible, conditionally compatible, and incompatible existing land uses within high-noise zones surrounding NS Mayport. It shows that over the next 5- to 10-year period, within high-noise zones, there will be 1,024 acres of compatible lands (of which 401.3 acres are submerged land and 547.5 acres are military land), 41.7 acres of conditionally compatible lands, and no land uses of potentially incompatible lands.

Table 6-5 presents a breakdown of land use compatibility by land use classification and noise zone. Almost all existing land uses (96%) are compatible within NS Mayport noise zones (Table 6-6). Only 41.7 acres, or less than 4%, are conditionally compatible, and none of the land area is incompatible. It is worthwhile to point out that the majority of land use considered compatible within the noise contours is classified as vacant/undeveloped, wetland/marsh, roads, or military.

Figure 6-4 illustrates areas of compatible, conditionally compatible, and incompatible land uses within NS Mayport's APZs. Within the APZs, there are 540 acres of compatible lands (this is either submerged or military land), 49.4 acres of conditionally compatible land use within the Clear Zone, and 13.7 acres that are incompatible. The incompatible land use within the Clear Zone is associated with the portion of the Timucuan Ecological and Historic Preserve located within the Clear Zone.

Source: Ecology & Environment, Inc. 2005; Wyle 2005; Naval Station Mayport 2000; National Park Service 2001

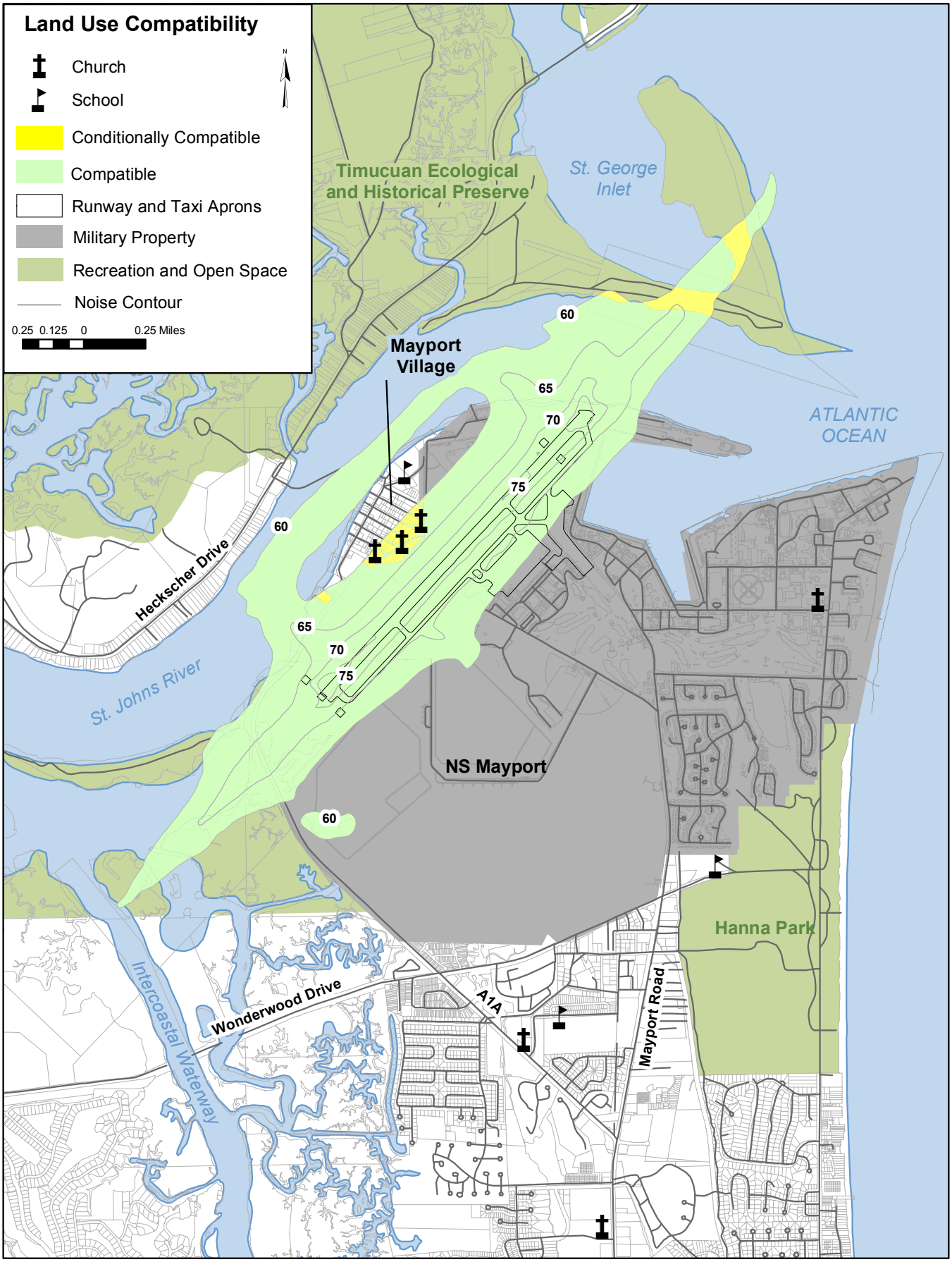

Figure 6-3
Existing Land Use Compatibility and 2006 Noise Contours
NS Mayport

Table 6-5
Existing Land Uses within Naval Station Mayport High-Noise Zones (acres)

Land Use	60-65 DNL			65-70 DNL			70-75 DNL			>75 DNL			Total
	Y	CC	N	Y	CC	N	Y	CC	N	Y	CC	N	
Residential	–	12	–	–			–	–	–	–	–	–	12
Manufacturing	2.5	–	–	–	–	–	–	–	–	–	–	–	2.5
Transportation	0.2	–	–	–	–	–	–	--	–	–	–	–	0.2
Trade	2.2	–	–	–	–	–	–	–	–	–	–	–	2.2
Services	47.5	3.7	–	5.4	–	–	–	–	–	–	–	–	56.6
Cultural and Recreation	–	25.5	–	–	0.4	–	–	–	–	–	–	–	25.9
Resource Production	–	–	–	–	–	–	–	–	–	–	–	–	–
Vacant/ Undeveloped	5.3	–	–	–	0.1	–	–	–	–	–	–	–	5.4
Wetland/Marsh	326.6	–	–	70.6	–	–	3.7	–	–	0.4	–	–	401.3
Military	250.5	–	–	174.8	–	–	109.1	–	–	13.1	–	–	547.5
Roads	12	–	–	2.9	–	–	–	–	–	–	–	–	14.9
Total Areas	**645.8**	**41.2**		**252.7**	**0.5**	**0**	**112.8**	**0**	**0**	**13.5**	**0**	**0**	**1,067.0**

Note: Due to rounding, totals in the table may not match.
Key:
– = Existing land use not within the area.
CC = Conditionally compatible.
DNL = Day-night average sound level.
N = Incompatible.
Y = Compatible.

Table 6-6
Compatibility of All Land Use Activities within the AICUZ Footprint Using Existing Land Uses

Compatibility	NOISE ZONES		APZ	
	Acres	%	Acres	%
Compatible	1,025.3	96%	540.21	90%
Conditionally Compatible	41.7	4%	46.85	7.8%
Incompatible	0	0%	13.8	2.2%
Total	**1,067.0**	**100%**	**600.8**	**100%**

Note: Due to rounding, totals in the table may not match.
Key:
% = Percent.
AICUZ = Air Installations Compatible Use Zones.
APZ = Accident potential zone.

Source: Ecology & Environment, Inc. 2005; Wyle 2005; Naval Station Mayport 2000; National Park Service 2001

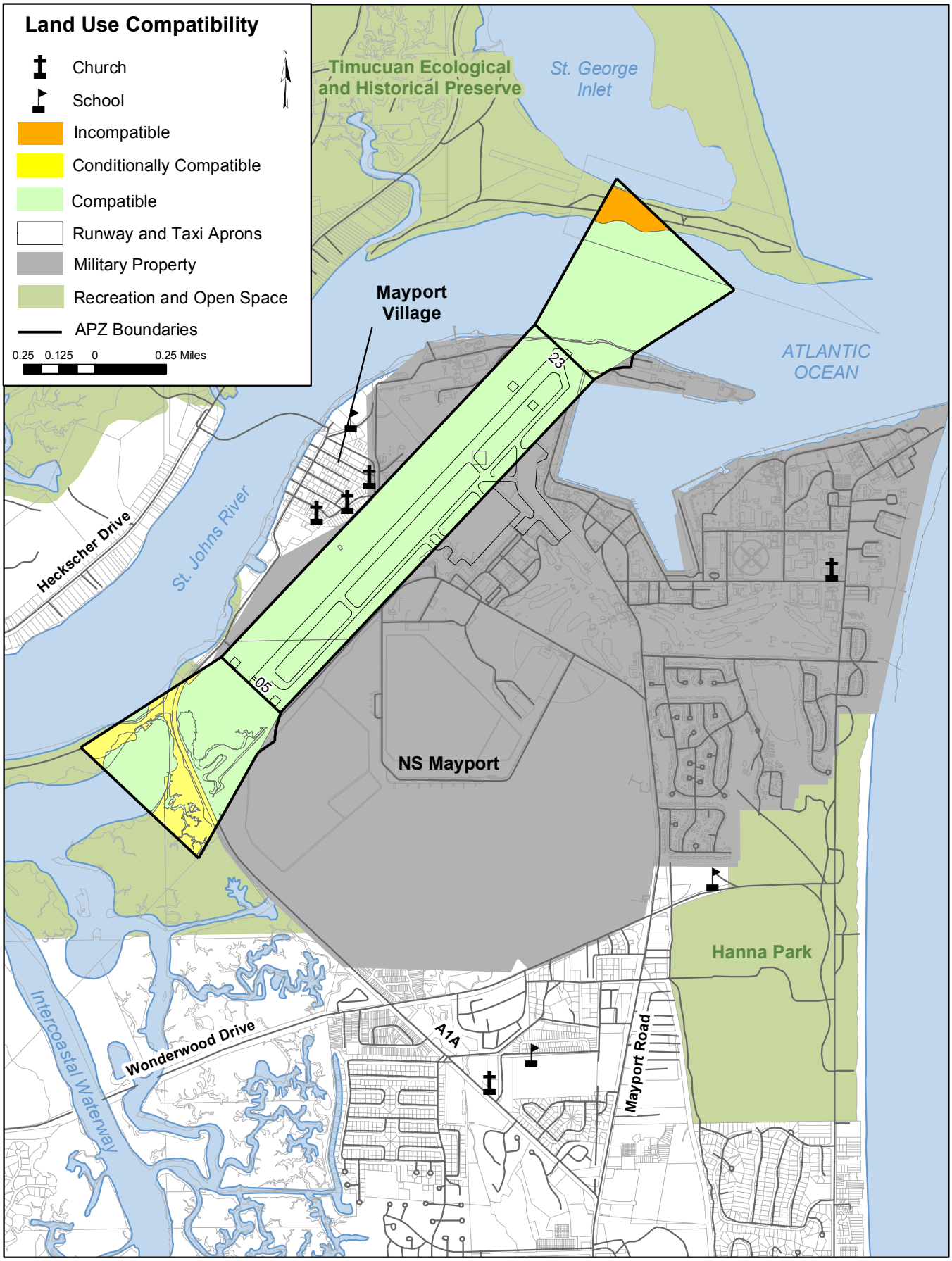

Figure 6-4
Existing Land Use Compatibility and 2006 APZs
NS Mayport

Table 6-7 presents a breakdown of land use compatibility by land use classification and APZ. The vast majority (89%) of existing land uses within NS Mayport's APZs are compatible. Approximately 8% are conditionally compatible and 3% are incompatible. Compatible land uses are primarily the land use classifications of wetland/marsh and military. The only incompatible land use is the portion of Huguenot Park (Timucuan Ecological and Historic Preserve), which lies within the Clear Zone for Runway 23. The land use classification for this parcel is Park/Recreation.

Table 6-7
Existing Land Uses within NS Mayport Primary Surface and Clear Zones (acres)

Land Use	Primary Surface			Clear Zone			Total
	Y	CC	N	Y	CC	N	
Residential	–	–	–	–	–	–	0
Manufacturing	–	–	–	–	–	–	0
Transportation	–	–	–	–	5.2	–	5.2
Trade	–	–	–	–	–	–	0
Services	–	–	–	–	39	–	39
Cultural and Recreation	–	–	–	–	–	13.7	13.7
Resource Production	–	–	–	–	–	–	0
Vacant/Undeveloped	–	–	–	1	–	–	1
Wetland/Marsh	1.3	–	–	163.4	–	–	164.7
Military	288	–	–	87.3	–	–	375.3
Roads	–	–	–	–	5.2		5.2
Total Areas	**289.3**	**0**	**0**	**250.7**	**49.4**	**13.7**	**604.1**

Key:
– = Existing land use not within the area.
CC = Conditionally compatible.
N = Incompatible.
Y = Compatible.

6.4 Summary of Land Use Compatibility

6.4.1 Installation Land Use Compatibility Concerns

The majority of development at the Installation occurs in the core areas east and south of the airfield. The core areas are a mixture of land use and are the most populated areas of the Station. Development within the core areas is not encumbered by Clear Zones, but small portions of the harbor basin and port facilities fall within the "greater than 60" DNL. Most of the on-station land use, with the exception of

housing, community facilities and recreational activities, is considered conditionally compatible within the 75 to 80 DNL. These land uses are incompatible at greater than 80 DNL. Areas of the Station outside the cores are generally undeveloped wetlands or developed with land use activities that would be more or less consistent with the APZs and noise zones in which the activities occur.

Research of the most recently proposed military construction projects for NS Mayport revealed no proposed land use activities that are inconsistent with APZs. No significant land use/noise incompatibilities would be expected from the proposed military construction projects. The significance of noise impacts would be similar to existing conditions.

6.4.2 Community Land Use Compatibility Concerns

Three churches are located within the "greater than 65" DNL (Figure 6-3). These churches are concentrated near the northwest boundary of the Installation within the Village of Mayport. Churches within high-noise zones are generally compatible with noise-level reduction; however, measures to achieve noise reduction do not necessarily solve noise difficulties. As shown on Figure 6-3, there are no institutional land use encroachments on the APZs outside the Installation.

While not totally built-out, the land area surrounding NS Mayport is dominated by mature development. For off-Installation properties, the land use compatibility analysis identifies a few properties that are currently undeveloped or vacant, or have an identified additional development potential. These properties are identified on Figure 6-5; the properties identified as "1" through "4" are currently vacant residentially zoned properties within the 2006 noise contours. As vacant land, they are compatible with the Navy's land use compatibility guidance (Table 6-4). However, should these properties be developed to their fullest potential, depending on the noise attenuation implemented during construction, they may not remain compatible with the Navy's land use recommendations.

Source: Ecology & Environment, Inc. 2005; Wyle 2005; Naval Station Mayport 2000; National Park Service 2001

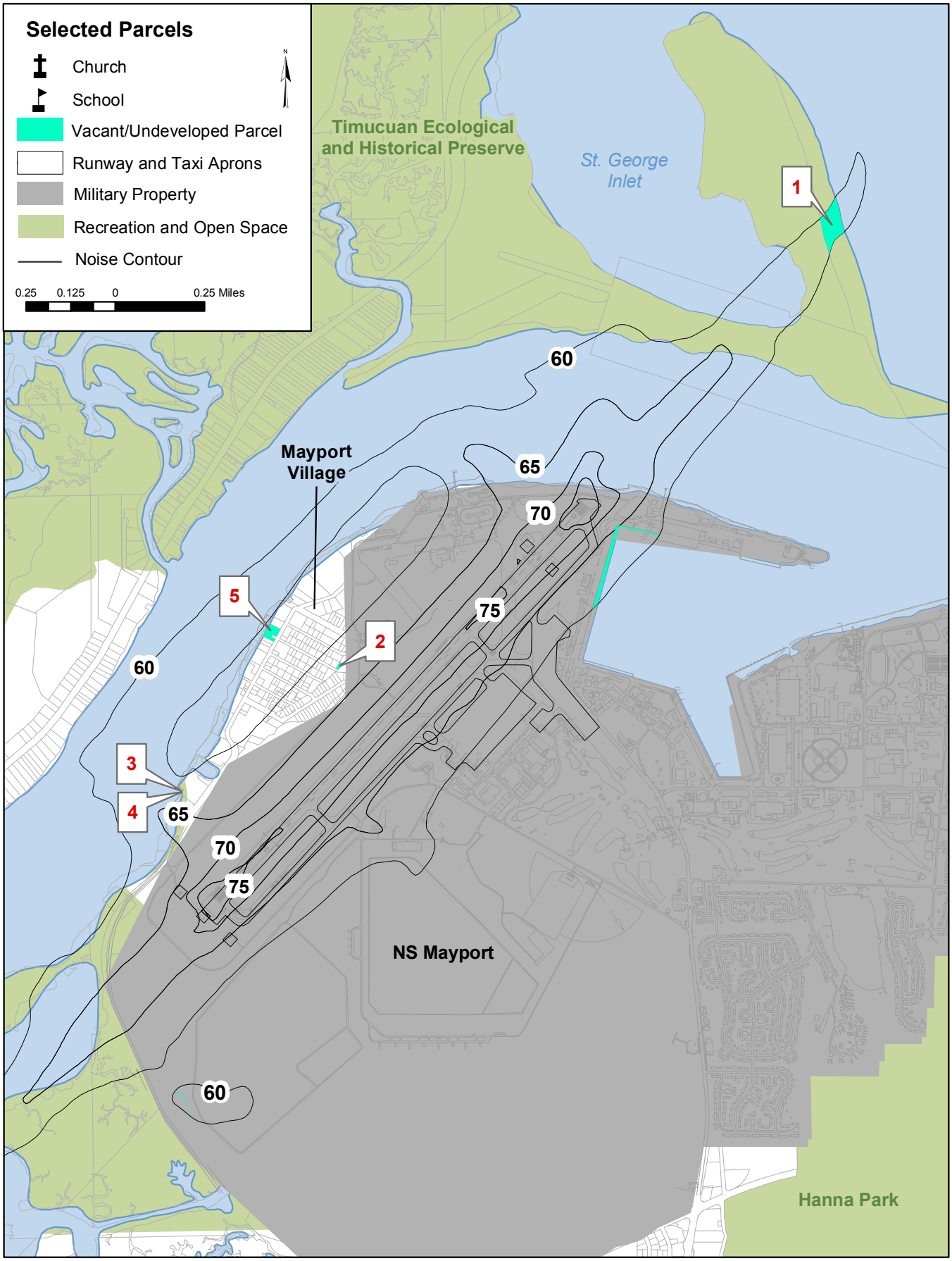

Figure 6-5
Vacant\Undeveloped Parcels with Development Potential
NS Mayport

The property identified with a "5" on Figure 6-5 is a property of interest for a proposed medium-density residential, mixed-use development. While technically outside the modeled noise contours, this property – due to its proximity to the airfield and its location to the dominant pattern flight tracks at NS Mayport –would, nonetheless, experience some noise exposure. Furthermore, should this site be redeveloped with a higher intensity use, consideration should be given to the development's height, as well as exterior light exposure.

Two other areas of community concern, in regard to air operations at NS Mayport, have been identified. One concern is a residential neighborhood community to the north of the base across the St. Johns River along Heckscher Drive. Historically, a proportionally large number of noise complaints have been received from this neighborhood. While not located within the noise contours of NS Mayport, this neighborhood may experience noise exposure of aircraft conduction pattern operations at NS Mayport due to the proximity of the St. Johns River and the increased propagation of sound over water. The current pattern flight tracks have been adjusted to remain over the center of the St. Johns River, rather than along the northern shoreline.

The other concern has been expressed by the river pilots for commercial shipping vessels entering and leaving the Jacksonville port through the St. Johns River regarding low-altitude overflight of commercial vessels by Navy aircraft. NS Mayport Air Operations investigated the occurrences and found the claims not to be warranted.

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7 Land Use Tools and Recommendations

AICUZ Program Goal
To protect the health, safety and welfare of those living near military fields, while preserving the defense flying mission.

The goal of the AICUZ Program – to protect the health, safety and welfare of those living near military airfields, while preserving the defense flying mission – can most effectively be accomplished by active participation of all interested parties, including the Navy, local governments, private citizens, developers, real estate professionals and others. Although NS Mayport is currently experiencing minimal land use encroachment within its AICUZ footprint, future changes in flight operations may warrant a revision to the current AICUZ footprint. Therefore, this section presents land use tools (techniques) and recommendations for continuing to achieve a successful AICUZ Program.

At the Installation level, the Air Installation Commander is responsible for ensuring a successful AICUZ Program. Pursuant to OPNAVINST 11010.36B (AICUZ Program) the Air Installation Commander at NS Mayport is committed to and shall:

- Implement an AICUZ Program for the Air Installation;
- Work with state and local planning officials to implement the objectives of the AICUZ plan;
- If appropriate, designate a community liaison officer to assist in the execution of the AICUZ plan by the Installation and to act as spokesperson for the Command in AICUZ matters;
- Provide assistance in developing AICUZ information, including operational data needed to update the AICUZ plan; and
- Justify the retention of land or interest of land required for operational performance.

7.1 Tools for Implementing AICUZ

This section discusses available, or potentially available, tools or techniques that can be used when dealing with land planning in the AICUZ impact environment.

7.1.1 Federal Level

Federal Level Tools for Implementing AICUZ
- Environmental Review
- Executive Order 12372, Intergovernmental Review of Federal Program
- GSA Federal Management Circular 75-2
- Housing and Urban Development (HUD) Circular 1390.2

- **Environmental Review.** Environmental review deals with the assessment of projects that may have some potential impact upon land use and the public's interest. For example, the National Environmental Policy Act mandates full disclosure of the environmental effects resulting from proposed federal actions, approvals, or funding. Impacts of the action are generally documented in an environmental impact statement (EIS) or an environmental assessment (EA), which is more limited in scope than the EIS. The environmental review process represents a procedure for incorporating the elements of the AICUZ in the planning review process.
- **Executive Order 12372, Intergovernmental Review of Federal Programs (July 1982).** As a result of the Intergovernmental Cooperation Act of 1968, the United States Bureau of the Budget requires that all Federal-Aid Development Projects must be coordinated with and reinforce state, regional, and local planning. Executive Order 12372 allows state governments to set up review periods and processes for federal projects.
- **Government Services Administration (GSA) Federal Management Circular 75-2.** This circular allows the air installation to extend its land use recommendations to federally funded projects in the vicinity. Specifically, it requires agencies sponsoring federally funded projects to ensure they are compatible with the land use plans of the air installation.
- **Housing and Urban Development (HUD) Circular 1390.2.** Approvals of mortgage loans from the Federal Housing Administration are subject to the requirements of this HUD circular. The circular sets forth a discretionary policy to withhold funds for housing projects when noise exposure exceeds prescribed levels. Residential construction may be permitted inside the 65-DNL contour, provided sound attenuation is accomplished. However, the added construction expense of noise attenuation may make siting in these noise exposure areas financially less attractive. Because the HUD policy is discretionary, variances may also be permitted, depending on regional interpretation and local

EIS
environmental impact statement

EA
environmental assessment

GSA
Governmental Services Administration

HUD
Housing and Urban Development

conditions. HUD also has a policy that prohibits funding for projects in clear zones and APZs unless the project is compatible with the AICUZ.

7.1.2 Local Government Tools

Local Government Tools for Implementing AICUZ
- Local Government Comprehensive Plans and Zoning Planning
- Capital Improvements Programs
- Transfer of Development Rights
- Purchase of Development Rights
- Building Code
- Real Estate Disclosure
- Public Land Acquisition Programs
- Health Code Programs
- Special Planning Districts

TDR
Transfer of Development Rights

- **Local Government Comprehensive Plans and Zoning Planning.** As discussed in Section 6.1.2, comprehensive plans and zoning regulations are tools available for use by the local governments for dealing with future land use planning and physical development. These tools have legal, binding authority for implementation.
- **Capital Improvements Programs.** Capital improvements projects, such as potable water lines, sewage transmission lines, road paving and/or improvements, new right-of-way acquisition, and schools can be used to direct growth and the types of growth toward areas compatible with the AICUZ Program. Local government agencies and organizations can develop capital improvement programs that avoid extending capital improvements into or near high-noise zones or APZs.
- **Transfer of Development Rights.** The concept of Transfer of Development Rights (TDR) involves a purchase of the property development rights and the transfer of those rights to another piece of property. Thus, development of the original property is prevented. Within its comprehensive plan, Jacksonville/Duval County has identified the TDR concept as an appropriate alternative to across-the-board restriction of private property rights.
- **Purchase of Development Rights.** The local government may consider the purchase of development rights. See Section 7.1.2.
- **Building Code.** The local building code can be used to ensure the noise-attenuation measures of the AICUZ Program. Although this tool will not prevent incompatible development, building codes can ensure compatibility to the greatest extent possible.
- **Real Estate Disclosure.** Jacksonville/Duval County has requirements within its zoning ordinances for a disclosure statement with an acknowledgement by both buyer and seller that the property is affected by noise and/or APZs. The County does not require a disclosure statement for lessees. Local governments have the authority to make real estate disclosure requirements applicable for both the buyer and lessees.
- **Public Land Acquisition Programs.** Public land acquisition programs can be used, as the conditions of the programs permit, for acquisition of land to support the AICUZ Program.

- **Health Code Programs.** These programs protect people from adverse elements that may endanger them, including poor sanitary facilities, diseases, and inadequate or unsafe water supplies. The programs also can be used to protect people from noise impacts.
- **Special Planning Districts.** Local governments have the power to create special districts for a special purpose such as land use control and the protection of the environment and human health.

7.1.3 Private Citizens/Real Estate Professionals/Businesses

- **Business -Development and Construction Loans to Private Contractors.** Lending institutions can limit financing for real estate purchases or construction incompatible with the AICUZ Program by restricting or prohibiting mortgage and/or other types of loans. The state and/or local government could designate restricted areas around the Installation.
- **Private Citizens.** Private citizens have the ability not to purchase property within high-noise zones and/or APZs.
- **Real Estate Professionals.** Real estate professionals have the ability to ensure that prospective buyers or lessees are fully aware of what it means to be within a high-noise zone and/or APZ. They have the ability to show prospective buyers and lessees the property at a time when noise exposure is expected to be at its worst.

7.2 Recommendations

7.2.1 NS Mayport Recommendations

Although ultimate control over land use and development in the vicinity of NS Mayport is the responsibility of the local government, the Navy has the ability and responsibility to conduct actions and implement programs in support of the local effort. To do this, NS Mayport should continue and/or consider the following:

- **Air Operations Procedures.** Aircrew discipline in pattern operations should be enforced, along with field noise abatement procedures, as set forth in Section 4.4, Table 4-2. The Navy should continue to examine ways to improve noise abatement procedures.

- **Noise Complaint Hotline.** A Noise Complaint Hotline should continue to be maintained and publicized with a phone number and website address. The current revisions to the NS Mayport's Air Operations Manual address this recommendation. A log of noise complaints should be maintained and a written response to each complaint provided. Complaints should be collected in a standard format for plotting locations in a spatial database for future planning use. These complaints can help:
  - Document whether newly developing sites may be noise sensitive in the future;
  - Provide land use planning information for the local government;
  - Determine which operational flight tracks may be responsible for the noise complaint and at what time most complaints occur; and
  - Provide valuable information for real-estate transactions.
- **Community Outreach Program.** Update and expand the Community Outreach Program, which is an educational program for presentations to real estate offices, neighborhood civic leagues, and service clubs.
- **Presentation of the AICUZ Program.** This presentation could be shown individually or collectively to community decisions-makers including the local planning commissions, city councils, county legislatures, councils of government, and other interested agencies. It would provide an opportunity to inform and educate those individuals or groups who make land use decisions (e.g., infrastructure siting, schools, zoning changes, etc.) that can either protect or threaten the mission of NS Mayport. For this, the NS Mayport website could be expanded to include AICUZ-specific topics, and various materials for presentation, and distribution should be developed or updated to include flight simulations, videos, poster boards, an electronic or slide presentation, and fact sheets. Presentation information could be used as part of the Community Outreach Program and would inform the general public on AICUZ issues, the Installation's contribution to the local economy, and the need for responsible land use planning.
- **Keep Engaged in the Local Planning Process.** NS Mayport should attend public hearings and provide comments on actions that may affect AICUZ planning, including comprehensive plan and land-development regulations updates and amendments. For instance, NS Mayport should continue to be involved in the current rewrite of Jacksonville/Duval County's AICUZ zoning ordinance. The

new ordinance is expected to be adopted by the local government sometime in early 2006.

- **Local Plans, Regulations, and Policies.** NS Mayport should continue to be an active participant in the local government and regional review, recommendation, and decision-making processes for land use decisions that may affect the operational integrity of the Installation, including:
  - Requests for rezoning or a variance to permit an incompatible use, such as a higher density or removal of height restrictions;
  - Capital improvements plans, such as potable water lines, sewage transmission lines, road paving and/or improvements, and new right-of-way acquisition;
  - Building code changes;
  - Ensuring the necessary ordinances and records-keeping capability that would be necessary to enact restriction within the AICUZ footprint;
  - Community facilities construction (e.g., schools, stadiums, churches);
  - Updates and amendments to local zoning ordinances and comprehensive plans or other such ordinances that may affect the Installations; and
  - Approvals for subdivision, site plans, wetland permits, or other proposed approvals necessary for development.

7.2.2 Local Government and Agency Recommendations

- **Communication.** While it is the responsibility of NS Mayport to inform and educate community decision-makers about the AICUZ Program, community decision-makers should continue to actively inform and seek input from NS Mayport regarding land use decisions that potentially may affect the operational integrity of the Installation.

  To communicate with the public, local governments should provide on their websites acknowledgement of the AICUZ Program for NS Mayport and provide a link to the NS Mayport website for information on aircraft operations and the NS Mayport AICUZ Program.

- **Decisions with Future Impacts.** It is recommended that when local governments make land use decisions that are in proximity to the established AICUZ footprint, local governments should recognize that:
  - Noise contours and APZs comprising the AICUZ footprint are dynamic and there is the potential for

changes in the AICUZ footprint as the operational needs to satisfy the military mission change; and

- There are active flight tracks without associated APZs because, at this time, there are not the requisite 5,000 annual aircraft operations necessary to have a corresponding APZ.

Because of the dynamics of the AICUZ Program, it is recommended that the local governments work with NS Mayport to establish a special planning area (or district) for those areas outside the established APZ that are most likely to present compatibility problems given changes in operations at NS Mayport. It is recommended that as a beginning point, the local governments use the flight tracks presented in Section 3.2.3 to preserve the operational integrity of these flight tracks and protect the health and safety of the underlying population.

- **Land Use Plans and Regulations.** As discussed in Section 7.1.3, local governments currently within the AICUZ footprint recognize their responsibility in providing land use controls in those areas encumbered by the AICUZ footprint in order to protect the health, safety, and general welfare of the population. The degree to which these land use controls are consistent with those recommended under Navy guidance varies greatly. Therefore, it is recommend that:
  - Jacksonville/Duval County adopt the revised airport zoning ordinances to bring it into conformity with the recommendation of the AICUZ Plan.
- **Capital Improvement.** It is recommended that all capital improvement projects in proximity to the Installation be evaluated and reviewed for the potential direct and indirect impacts that such improvements may have on the ability to implement a successful AICUZ Program.
- **Building Codes.** Review and/or modify the local building code to ensure consistency with the noise attenuation recommendations of the AICUZ Program as specified in OPNAVINST 11010.36B.
- **Public Land Acquisition Programs.** These programs should be reviewed to understand if they can be used in support of the AICUZ Program.

7.2.3 Private Citizens/Real Estate Professionals/Businesses Recommendations

- **Real Estate Professionals.** Real estate professionals should:
  - Provide written disclosure to prospective purchasers, renters, or leases when a property is located within an APZ or high-noise zone;
  - Provide, on their websites, acknowledgement of the AICUZ Program for NS Mayport and provide a link to the NS Mayport website for information on aircraft operations and the AICUZ Program at NS Mayport;
  - Provide an AICUZ brochure to prospective buyers and lessees; and
  - To the greatest extent possible, make prospective buyers and lessees aware of the potential magnitude of noise exposure they might experience.
- **Business - Development and Construction Loans to Private Contractors.** Lending institutions should consider whether to limit financing for real estate purchases or construction incompatible with the AICUZ Program. This strategy encourages review of noise and accident potential as part of a lender's investigation of potential loans to private interests for real-estate acquisition and development. Diligent lending practices will promote the compatible development of Jacksonville/Duval County and protect lenders and developers alike. Local banking and financial institutions should be encouraged to incorporate a "Due Diligence Review" of all loan applications, including a determination of possible noise or APZ impacts on the mortgaged property. The Navy can play a role in this strategy by providing AICUZ seminars to lenders throughout the region.
- **Citizens.** The citizens of the local community have a responsibility to:
  - Provide sufficient and accurate information when registering a noise complaint with the Installation. The Installation needs sufficient and accurate information to assess the potential causes resulting in the complaint and to assess any practical remedies for reducing future complaints; and
  - To become informed about the ACUIZ Program at NS Mayport and to learn about the goals and objectives of the program; its value in protecting the health, safety, and welfare of the population; the limits of the program;

and the positive community aspects of a successful AICUZ Program.

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Appendix A

NS Mayport
Air Operations Data 2003

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FINAL

Wyle Report

WR 05-27

Aircraft Noise Study for Naval Station Mayport Jacksonville, Florida

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3.0 Existing Calendar Year 2003 Conditions

As described in Section 1.0, noise modeling requires input of various parameters to obtain the resulting noise contour, which depicts the noise environment at NS Mayport. This section describes the operational conditions and the data collected through on-site interviews, phone interviews and e-mail exchanges with Air Traffic Control, Air Ops personnel, and SH-60B pilots.

3.1 Annual Flight Operations

The annual operations at NS Mayport were derived from data provided by Air Traffic Control in the form of summary tables entitled *ATC Div Accounting Data for CY03* and the *Daily Operations for CY03* (Wyle Labs 2004, Wisely et al.). From this data, the total number of operations for CY03 was derived to be 103,066. This number includes airfield operations and transit operations. The operations that were modeled were Navy, Marine and other military operations that totaled 101,568. This number excludes 1,498 of which, 620 were transit Navy/Marine operations, 186 other military and 692 air carrier and general aviation operations.

The data was listed by aircraft and operation type. This was then divided by 365 days to derive the modeled AAD operations. The rotary-wing and fixed-wing operational data presented in Table 3-1 were reviewed and validated by NS Mayport personnel during the data validation process. This table shows the based SH-60B and representative transient aircraft and their operations for CY03.

The previous noise study (TN 00-01) was utilized to determine the proportions of aircraft mix and airfield operations at NS Mayport along with the applicable percentages for daytime (0700-2200) and nighttime (2200-0700) operations. This was due to assessment by base personnel that there was little or no change in the overall distribution and mix of operations at NS Mayport since the previous study. The result of applying those percentages to the total number of operations for CY03 is shown in Table 3-1 (Wyle Labs 2005, Wisely et al.).

Table 3-1. Annual Airfield Operations for CY03 at NS Mayport

Aircraft	Departures	"Straight-In" Full-Stop Arrival	Overhead Break Arrival (1500')	Touch & Go	GSI	GCA Box	Total
SH-60	4,099	4,099		80439	1,641	9,979	**100,256**
C-12	74	74		297	0	42	**487**
S-3	10	10		38	0	354	**412**
C-9	70	70		0	0	16	**155**
T-45	38	38		0	0	75	**151**
F/A-18 C/D	10	0	10	39	0	5	**64**
F-14	3	3		14	0	6	**27**
F-15	4	4		0	0	8	**16**
TOTAL	**4,307**	**4,297**	**10**	**80,828**	**1,641**	**10,485**	**101,568**

Source: Botto et.al and Wyle Labs 2004

Note: Due to rounding the totals in the above table may not match

A sensitivity analysis was conducted to determine the major contributors to the overall noise exposure at NS Mayport. This analysis was done utilizing SEL values for each modeled aircraft at comparable flight conditions. The SH-60B helicopter is the top contributor to the noise environment and is followed by the S-3 and the C-9 as the top three contributors respectively. These three aircraft account for 98.9% of the noise energy produced as a result of total aircraft operations at NS Mayport. Note that this assessment is an estimation of overall noise contributors of aircraft at a single point based on normalized altitude, power, and speed data. This analysis is helpful in determining the overall composition of noise exposure for the purpose of determiining the relevance of each aircraft type to the noise environment at the station. Noise contributions at various points around the NS will vary depending on traffic distribution and individual flight profiles.

3.2 Runway and Flight Track Utilization

The annual operations, must not only be described in terms of aircraft type and operation type, but also by runway and flight track use, temporal use (day or night), as well as by the specific type of operation (departure, arrival etc.), all of which are required for noise contour generation.

Note that for noise modeling purposes, acoustical day and night are defined as follows: Day (0700 – 2200) Night (2200 – 0700).

Runway utilization is usually dictated by wind conditions, the latter affecting traffic flow management within the terminal airspace and influencing runway assignments for both arrival and departure operations. Runway use was provided for this study based on recorded air traffic activity reports collected by ATC at NS Mayport. Table 3-2 depicts airfield operations by time of

day and operation type. It is an extension of Table 3-1 with the addition of acoustical, day and night operational numbers. The application of percentages utilized in the previous report, yielded the day/night split for this report.

Table 3-2. Annual Day and Night Airfield Operations for CY03 at NS Mayport

Aircraft	Departures			"Straight-In" Full-Stop Arrival			Overhead Break Arrival			Touch & Go		
Type	0700–2200	2200–0700	Total	0700–2200	2200–0700	Total	0700–2200	2200–0700	Total	0700–2200	2200–0700	Total
SH-60	3863	235	4,099	3,863	235	4,099			0	76651	3,788	80,439
C-12	72	2	74	74	1	74			0	295	2	297
F/A-18 C/D	10	0	10	0	0	0	10	0	10	39	0	39
S-3	10	0	10	10	0	10			0	38	0	38
F-14	3	0	3	3	0	3			0	14	0	14
C-9	70	0	70	70	0	70			0	0	0	0
T-45	38	0	38	38	0	38			0	0	0	0
F-15	4	0	4	4	0	4			0	0	0	0
TOTAL	**4,069**	**238**	**4,307**	**4,061**	**236**	**4,297**	**10**	**0**	**10**	**77,037**	**3,791**	**80,828**

Note: Due to rounding the totals in the above table may not match

Table 3-2. Annual Day and Night Airfield Operations for CY03 at NS Mayport - *concluded*

Aircraft	GSI			GCA Box			Grand Total		
Type	0700–2200	2200–0700	Total	0700–2200	2200–0700	Total	0700–2200	2200–0700	Total
SH-60	0	1,641	1,641	8,691	1,288	9,979	93,068	7,188	100,256
C-12			0	42	0	42	482	5	487
S-3			0	354	0	354	412	0	412
C-9			0	15	1	16	154	1	155
T-45			0	75	0	75	151	0	151
F/A-18 C/D			0	3	1	5	63	1	64
F-14			0	6	0	6	27	0	27
F-15			0	8	0	8	16	0	16
TOTAL	**0**	**1,641**	**1,641**	**9,195**	**1,290**	**10,485**	**94,373**	**7,195**	**101,568**

Note: Due to rounding the totals in the above table may not match

Runway and flight track use is provided in Table 3-3. This information was derived from a combination of on-site interviews with ATC personnel and the application of track percentages from the previous noise study (TN 00-01), as it was determined by base personnel that previously-modeled distribution of traffic closely matches existing distributions modeled for CY03. The runway use was determined to be 49% for Runway 05 and 51% for Runway 23. Generally speaking, rotary-wing operations are rather evenly split between the runways and available flight tracks due to the sporadic nature of helicopter operations within the terminal environment. Whereas, fixed-wing operations utilize specific flight tracks for each operation type conducted at the airfield.

Table 3-3. Runway and Flight Track Utilization for CY03 at NS Mayport

Operation Type	Runway	Runway Utilization	Flight Track ID	Flight Track Description	SH-60	F/A-18 C/D	F-15	C-9	S-3	T-45	F-14	C-12
Departure	5	49%	05D1	Talbot-North	20%	100%	100%	100%	100%	100%	100%	100%
			05D3	Channel-East	20%							
			05D4	Channel-South	25%							
			05D6	Intercoastal-S	15%							
			05D7	River-West	10%							
			05D2	TRACON-IFR	10%							
	23	51%	23D1	Talbot-North	20%	50%	50%	50%	50%	50%	50%	50%
			23D2	Hanna Lake-E	20%							
			23D3	Intercoastal-S	15%							
			23D4	River-West	20%							
			23D8	Channel-East	8%							
			23D9	Channel-South	5%							
			23D5	TRACON-IFR	12%	50%	50%	50%	50%	50%	50%	50%
Arrival	5	49%	05A1	Talbot-North	18%							
			05A2	Hanna Lake-E	10%							
			05A3	Intercoastal-S	18%							
			05A4	River-West	23%							
			05A5	IFR Straight-In	10%		100%	100%	100%	100%	100%	100%
			05A6	Channel-East	15%							
			05A7	Channel-South	6%							
			05O1	OVHD-Break		100%						
	23	51%	23A1	Talbot-North	15%							
			23A2	IFR Straight-In	13%		100%	100%	100%	100%	100%	100%
			23A3	Channel-East	13%							
			23A4	Channel-South	12%							
			23A5	Intercoastal-S	25%							
			23A6	River-West	22%							
			23O1	OVHD-Break		100%						
GCA	5	46%	05G1	GCA Box	100%	100%	100%	100%	100%	100%	100%	100%
	23	54%	23G1	GCA Box	100%	100%	100%	100%	100%	100%	100%	100%
Closed Pattern (RW)*	5	46%	05T2	Parallel & Pad 3	35%							
			05T4	Helo Traffic	65%							
	23	54%	23T2	Parallel & Pad 3	35%							
			23T4	Helo Traffic	65%							
Closed Pattern (FW)**	5	46%	05T2-F18	Jet Traffic		100%			100%		100%	100%
	23	54%	23T2-F18	Jet Traffic		100%			100%		100%	100%
GSI (RW)*	5	100%	05Z1	LH pattern	100%							

* RW - Rotary Wing
** FW - Fixed Wing

The Average Annual Day operations were calculated by applying both the time of day, as well as the individual flight track percentages, to the total annual operations of Table 3-1 and dividing by 365 days. This results in the AAD utilization of each flight track by time of day. These AAD operations are summarized in Table 3-4 for the aircraft that were modeled. Although, the table details operations up to two decimal places, the operations were modeled utilizing up to four decimal places to account for all AAD operations at NS Mayport.

Table 3-4. Modeled Average Annual Day Operations for CY03 at NS Mayport

Operation Type	Runway	Runway Utilization	Flight Track	SH-60			F/A-18 C/D		
			ID	0700-2200	2200-0700	Total	0700-2200	2200-0700	Total
Departure	5	49%	05D1	1.04	0.06	1.10	0.01	0.00	0.01
			05D3	1.04	0.06	1.10			
			05D4	1.30	0.08	1.38			
			05D6	0.78	0.05	0.83			
			05D7	0.52	0.03	0.55			
			05D2	0.52	0.03	0.55			
	23	51%	23D1	1.08	0.07	1.14	0.01	0.00	0.01
			23D2	1.08	0.07	1.14			
			23D3	0.81	0.05	0.86			
			23D4	1.08	0.07	1.14			
			23D8	0.43	0.03	0.46			
			23D9	0.27	0.02	0.29			
			23D5	0.65	0.04	0.69	0.01	0.00	0.01
Arrival	5	49%	05A1	0.93	0.06	0.99			
			05A2	0.52	0.03	0.55			
			05A3	0.93	0.06	0.99			
			05A4	1.19	0.07	1.27			
			05A5	0.52	0.03	0.55			
			05A6	0.78	0.05	0.83			
			05A7	0.31	0.02	0.33			
			05O1			0.00	0.01	0.00	0.01
	23	51%	23A1	0.81	0.05	0.86			
			23A2	0.70	0.04	0.74			
			23A3	0.70	0.04	0.74			
			23A4	0.65	0.04	0.69			
			23A5	1.35	0.08	1.43			
			23A6	1.19	0.07	1.26			
			23O1			0.00	0.01	0.00	0.01
GCA Box	5	46%	05G1	5.48	0.81	6.29	0.00	0.00	0.00
	23	54%	23G1	6.43	0.95	7.38	0.00	0.00	0.00
Closed Pattern (RW)*	5	46%	05T2	16.91	0.84	17.74			
			05T4	31.40	1.55	32.95			
	23	54%	23T2	19.85	0.98	20.83			
			23T4	36.86	1.82	38.68			
Closed Patter (FW)**	5	46%	5T2-F18				0.02	0.00	0.02
	23	54%	23T2-F18				0.03	0.00	0.03
GSI (RW)*	5	100%	05Z1	0.00	2.25	2.25			

*** RW - Rotary Wing**
**** FW - Fixed Wing**
Note: Due to rounding the totals in the above table may not match

Table 3-4. Modeled Average Annual Day Operations for CY03 at NS Mayport - *continued*

Operation Type	Runway	Runway Utilization	Flight Track	F-15			C-9		
			ID	0700-2200	2200-0700	Total	0700-2200	2200-0700	Total
Departure	5	49%	05D1	0.01	0.00	0.01	0.09	0.00	0.09
			05D3						
			05D4						
			05D6						
			05D7						
			05D2						
	23	51%	23D1	0.00	0.00	0.00	0.05	0.00	0.05
			23D2						
			23D3						
			23D4						
			23D8						
			23D9						
			23D5	0.00	0.00	0.00	0.05	0.00	0.05
Arrival	5	49%	05A1						
			05A2						
			05A3						
			05A4						
			05A5	0.01	0.00	0.01	0.09	0.00	0.09
			05A6						
			05A7						
			05O1						
	23	51%	23A1						
			23A2	0.01	0.00	0.01	0.10	0.00	0.10
			23A3						
			23A4						
			23A5						
			23A6						
			23O1						
GCA Box	5	46%	05G1	0.01	0.00	0.01	0.01	0.00	0.01
	23	54%	23G1	0.01	0.00	0.01	0.01	0.00	0.01
Closed Pattern (RW)*	5	46%	05T2						
			05T4						
	23	54%	23T2						
			23T4						
Closed Patter (FW)**	5	46%	5T2-F18						
	23	54%	23T2-F18						
GSI (RW)*	5	100%	05Z1						

*** RW - Rotary Wing**
**** FW - Fixed Wing**
Note: Due to rounding the totals in the above table may not match

Table 3-4. Modeled Average Annual Day Operations for CY03 at NS Mayport - *continued*

Operation Type	Runway	Runway Utilization	Flight Track	S-3			T-45		
			ID	0700-2200	2200-0700	Total	0700-2200	2200-0700	Total
Departure	5	49%	05D1	0.01	0.00	0.01	0.05	0.00	0.05
			05D3						
			05D4						
			05D6						
			05D7						
			05D2						
	23	51%	23D1	0.01	0.00	0.01	0.03	0.00	0.03
			23D2						
			23D3						
			23D4						
			23D8						
			23D9						
			23D5	0.01	0.00	0.01	0.03	0.00	0.03
Arrival	5	49%	05A1						
			05A2						
			05A3						
			05A4						
			05A5	0.01	0.00	0.01	0.05	0.00	0.05
			05A6						
			05A7						
			05O1						
	23	51%	23A1						
			23A2	0.01	0.00	0.01	0.05	0.00	0.05
			23A3						
			23A4						
			23A5						
			23A6						
			23O1						
GCA Box	5	46%	05G1	0.22	0.00	0.22	0.05	0.00	0.05
	23	54%	23G1	0.26	0.00	0.26	0.06	0.00	0.06
Closed Pattern (RW)*	5	46%	05T2						
			05T4						
	23	54%	23T2						
			23T4						
Closed Patter (FW)**	5	46%	5T2-F18	0.02	0.00	0.02			
	23	54%	23T2-F18	0.03	0.00	0.03			
GSI (RW)*	5	100%	05Z1						

*** RW - Rotary Wing**
**** FW - Fixed Wing**
Note: Due to rounding the totals in the above table may not match

Table 3-4. Modeled Average Annual Day Operations for CY03 at NS Mayport - *concluded*

Operation Type	Runway	Runway Utilization	Flight Track	F-14			C-12		
			ID	0700-2200	2200-0700	Total	0700-2200	2200-0700	Total
Departure	5	49%	05D1	0.00	0.00	0.00	0.10	0.00	0.10
			05D3						
			05D4						
			05D6						
			05D7						
			05D2						
	23	51%	23D1	0.00	0.00	0.00	0.05	0.00	0.05
			23D2						
			23D3						
			23D4						
			23D8						
			23D9						
			23D5	0.00	0.00	0.00	0.05	0.00	0.05
Arrival	5	49%	05A1						
			05A2						
			05A3						
			05A4						
			05A5	0.00	0.00	0.00	0.10	0.00	0.10
			05A6						
			05A7						
			05O1						
	23	51%	23A1						
			23A2	0.00	0.00	0.00	0.10	0.00	0.10
			23A3						
			23A4						
			23A5						
			23A6						
			23O1						
GCA Box	5	46%	05G1	0.00	0.00	0.00	0.03	0.00	0.03
	23	54%	23G1	0.00	0.00	0.00	0.03	0.00	0.03
Closed Pattern (RW)*	5	46%	05T2						
			05T4						
	23	54%	23T2						
			23T4						
Closed Patter (FW)**	5	46%	5T2-F18	0.01	0.00	0.01	0.19	0.00	0.19
	23	54%	23T2-F18	0.01	0.00	0.01	0.22	0.00	0.22
GSI (RW)*	5	100%	05Z1						

*** RW - Rotary Wing**

**** FW - Fixed Wing**

Note: Due to rounding the totals in the above table may not match

The flight tracks modeled in this study are shown in Figures 3-1 through 3-10. They illustrate all the departure, arrival and pattern flight tracks listed in Table 3-2. They are illustrated in this report separately for Rotary Wing (RW) and Fixed Wing (FW) aircraft operations. RW tracks are depicted in Figures 3-1 through 3-6, while FW tracks are depicted in Figures 3-7 through 3-10.

Rotary-wing arrivals from the north and east are required to approach both runways by flying over the middle of St. Johns River, so as to avoid over-flying land, north of the river, and extending the noise exposure due to operations at NS Mayport. The same rules apply to rotary-wing departures that utilize flight tracks that over-fly the river, north of the runway. Rotary-wing pattern tracks are illustrated in Figure 3-5 and 3-6. Flight tracks 05T2, 05T4, 23T2 and 23T4 are touch & go flight tracks. 05Z1 is a Glide Slope Indicator (GSI) pattern, which is utilized exclusively at night. Rotary-wing GCA operations utilize flight tracks, 05G1 and 23G1.

Fixed-wing aircraft utilize three departure tracks, which are illustrated on Figure 3-7. Straight-in arrival tracks 05A5 and 23A2 are utilized by all fixed-wing aircraft, with the exception of the F/A-18C/D for the Existing CY03 conditions and the F/A-18E/F for the Prospective CY08 conditions. These two aircraft use overhead-break arrival tracks 05O1 and 23O1. Figures 3-9 and 3-10, illustrate the Touch & Go along with the GCA flight tracks. The pattern altitude for the Touch & Go tracks is 1,000 feet AGL (Above Ground Level). The pattern altitude for the GCA flight tracks are 1,500 feet AGL, when approaching Runway 05 and 2,100 feet AGL, when approaching Runway 23 (Wyle Labs 2004).

Appendix B

Land Use Compatibility Recommendations

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Table B-1 Land Use Compatibility Recommendations								
Land Use		**Accident Potential Zones1**			**Noise Levels**			
SLUCM No.	**Name**	**Clear Zone**	**APZ 1**	**APZ 2**	**65-70 DNL**	**70-75 DNL**	**75-80 DNL**	**80-85 DNL**
10	Residential							
11	Household units	NA	NA	NA	N26	N26	N	N
11.11	Single units; detached	N	N	Y2	N26	N26	N	N
11.12	Single units; semidetached	N	N	N	N26	N26	N	N
11.13	Single units; attached row	N	N	N	N26	N26	N	N
11.21	Two units; side-by-side	N	N	N	N26	N26	N	N
11.22	Two units; one above the other	N	N	N	N26	N26	N	N
11.31	Apartments; walk up	N	N	N	N26	N26	N	N
11.32	Apartments; elevator	N	N	N	N26	N26	N	N
12	Group quarters	N	N	N	N26	N26	N	N
13	Residential hotels	N	N	N	N26	N26	N	N
14	Mobile home parks or courts	N	N	N	N	N	N	N
15	Transient lodgings	N	N	N	N26	N26	N26	N
16	Other residential	N	N	N	N26	N26	N	N
20	Manufacturing3							
21	Food and kindred products; manufacturing	N	N	Y4	Y	Y27	Y22	Y29
22	Textile mill products; manufacturing	N	N	Y4	Y	Y27	Y28	Y29
23	Apparel and other finished products made from fabrics, leather, and similar materials; manufacturing	N	N	N	Y	Y27	Y28	Y29
24	Lumber and wood products (except furniture); manufacturing	N	Y5	Y5	Y	Y27	Y28	Y29
25	Furniture and fixtures; manufacturing	N	Y5	Y5	Y	Y27	Y28	Y29
26	Paper and allied products; manufacturing	N	Y5	Y5	Y	Y27	Y28	Y29
27	Printing, publishing, and allied industries	N	Y5	Y5	Y	Y27	Y28	Y29
28	Chemicals and allied products; manufacturing	N	N	N	Y	Y27	Y28	Y29
29	Petroleum refining and related industries	N	N	N	Y	Y27	Y28	Y29
30	Manufacturing (cont'd) 3							
31	Rubber and misc. plastic products; manufacturing	N	N	N	Y	Y27	Y28	Y29
32	Stone, clay, and glass products; manufacturing	N	N	Y5	Y	Y27	Y28	Y29
33	Primary metal products; manufacturing	N	N	Y5	Y	Y27	Y28	Y29
34	Fabricated metal products; manufacturing	N	N	Y5	Y	Y27	Y28	Y29
35	Professional, scientific, and controlling instruments; photographic and optical goods; watches and clocks; manufacturing	N	N	N	Y	25	30	N
39	Miscellaneous manufacturing	N	Y6	Y6	Y	Y27	Y28	Y29
40	Transportation, communication and utilities3,6							

Table B-1 Land Use Compatibility Recommendations								
Land Use		**Accident Potential Zones1**			**Noise Levels**			
SLUCM No.	**Name**	**Clear Zone**	**APZ 1**	**APZ 2**	**65-70 DNL**	**70-75 DNL**	**75-80 DNL**	**80-85 DNL**
41	Railroad, rapid rail transit, and street railway transportation	N	Y3,7	Y3	Y	Y27	Y28	Y29
42	Motor vehicle transportation	N	Y3,7	Y3	Y	Y27	Y28	Y29
43	Aircraft transportation	N	Y3,7	Y3	Y	Y27	Y28	Y29
44	Marine craft transportation	N	Y3,7	Y3	Y	Y27	Y28	Y29
45	Highway and street right-of-way	N	Y3,7	Y3	Y	Y27	Y28	Y29
46	Automobile parking	N	Y3,7	Y3	Y	Y27	Y28	Y29
47	Communication	N	Y3,7	Y3	Y	2530	3030	N
48	Utilities	N	Y3,7	Y3	Y	Y27	Y28	Y29
485	Solid waste disposal (landfills, incineration, etc.)	N	N	N	NA	NA	NA	NA
49	Other transportation, communication and utilities	N	Y3,7	Y3	Y	2530	3030	N
50	Trade							
51	Wholesale trade	N	Y5	Y5	Y	Y27	Y28	Y29
52	Retail trade – building materials, hardware and farm equipment	N	Y8	Y8	Y	Y27	Y28	Y29
53	Retail trade – shopping centers	N	N9	Y9	Y	25	30	N
54	Retail trade – food	N	N	Y10	Y	25	30	N
55	Retail trade – automotive, marine craft, aircraft and accessories	N	Y8	Y8	Y	25	30	N
56	Retail trade – apparel and accessories	N	N	Y11	Y	25	30	N
57	Retail trade – furniture, home furnishings and equipment	N	N	Y11	Y	25	30	N
58	Retail trade – eating and drinking establishments	N	N	N	Y	25	30	N
59	Other retail trade	N	N	Y9	Y	25	30	N
60	Services12							
61	Finance, insurance and real estate services	N	N	Y13	Y	25	30	N
62	Personal services	N	N	Y14	Y	25	30	N
62.4	Cemeteries	N	Y15	Y15	Y	Y27	Y28	Y29,24
63	Business services	N	N	Y16	Y	25	30	N
63.7	Warehousing and storage	N	Y17	Y17	Y	Y27	Y28	Y29
64	Repair services	N	Y18	Y18	Y	Y27	Y28	Y29
65	Professional services	N	N	Y9	Y	25	30	N
65.1	Hospitals, other medical facilities	N	N	N	25	30	N	N
65.16	Nursing homes	N	N	N	N26	N26	N	N
66	Contract construction services	N	Y18	Y18	Y	25	30	N
67	Governmental services	N	N	Y10	Y26	25	30	N
68	Educational services	N	N	N	25	30	N	N
69	Miscellaneous services	N	N	Y9	Y	25	30	N

Table B-1 Land Use Compatibility Recommendations								
Land Use		**Accident Potential Zones1**			**Noise Levels**			
SLUCM No.	**Name**	**Clear Zone**	**APZ 1**	**APZ 2**	**65-70 DNL**	**70-75 DNL**	**75-80 DNL**	**80-85 DNL**
70	Cultural, entertainment and recreational							
71	Cultural activities (including churches)	N	N	N	25	30	N	N
71.2	Nature exhibits	N	Y19	Y19	Y26	N	N	N
72	Public assembly	N	N	N	Y	N	N	N
72.1	Auditoriums, concert halls	N	N	N	25	30	N	N
72.11	Outdoor music shells, amphitheaters	N	N	N	N	N	N	N
72.2	Outdoor sports arenas, spectator sports	N	N	N	Y31	Y31	N	N
73	Amusements (including fairgrounds, miniature golf, driving ranges, amusement parks)	N	N	Y	Y	Y	N	N
74	Recreational activities (including golf courses, riding stables, water recreation)	N	Y18,19	Y18,19	Y26	25	30	N
75	Resorts and group camps	N	N	N	Y26	Y26	N	N
76	Parks	N	Y18,19	Y18,19	Y26	Y26	N	N
79	Other cultural, entertainment and recreation	N	Y18,19	Y18,19	Y26	Y26	N	N
80	Resource production and extraction							
81	Agriculture (except livestock)	Y6	Y20	Y20	Y32	Y33	Y34	Y34,35
81.5, 81.7	Livestock farming and animal breeding	N	Y20,21	Y20,21	Y32	Y33	N	N
82	Agricultural related activities	N	Y20,22	Y20,22	Y32	Y33	Y34	Y34,35
83	Forestry activities and related services23	N	Y22	Y22	Y32	Y33	Y34	Y34,35
84	Fishing activities and related services24	N24	Y22	Y22	Y	Y	Y	Y
85	Mining activities and related services	N	Y22	Y22	Y	Y	Y	Y
89	Other resource production and extraction	N	Y22	Y22	Y	Y	Y	Y
90	Other							
91	Undeveloped land	Y	Y	Y	NA	NA	NA	NA
93	Water areas	N25	N25	N25	NA	NA	NA	NA

Notes:

1. A “Yes” or a “No” designation for compatible land use is to be used only for general comparison. Within each, uses exist where further evaluation may be needed in each category as to whether it is clearly compatible, normally compatible, or not compatible due to the variation of densities of people and structures. In order to assist installations and local governments, general suggestions as to floor/area ratios are provided in OPNAVINST 11010.36B as a guide to density in some categories. In general, land use restrictions which limit commercial, services, or industrial buildings or structure occupants to 25 per acre in APZ 1, and 50 per acre in APZ 2 are the range of occupancy levels considered to be low density. Outside events should normally be limited to assemblies of not more than 25 people per acre in APZ 1, and maximum assemblies of 50 people per acre in APZ 2.
2. The suggested maximum density for detached single-family housing is 1-2 dwelling units per acre (Du/Ac). In a Planned Unit Development (PUD) of single family detached units where clustered housing development results in large open areas, this density could possibly be increased provided the amount of surface area covered by structures does not exceed 20 percent of the PUD total area. PUD encourages clustered development that leaves large open areas.
3. Other factors to be considered: Labor intensity, structural coverage, explosive characteristics, air-pollution, electronic interference with aircraft, height of structures, and potential glare to pilots.

Table B-1 Land Use Compatibility Recommendations								
Land Use		Accident Potential Zones1			Noise Levels			
SLUCM No.	Name	Clear Zone	APZ 1	APZ 2	65-70 DNL	70-75 DNL	75-80 DNL	80-85 DNL

4. Maximum FAR of 0.56.
5. Maximum FAR of 0.28 in APZ 1 and 0.56 in APZ 2.
6. No structures (except airfield lighting), buildings or aboveground utility/communications lines should normally be located in Clear Zone areas on or off the installation. The Clear Zone is subject to severe restrictions. See NAVFAC P-80.3 or Tri-Service Manual AFM 32-1123(I); TM 5-803-7, NAVFAC P-971 “Airfield and Heliport Planning & Design” dated 1 May 99 for specific design details.
7. No passenger terminals and no major aboveground transmission lines in APZ 1.
8. Maximum FAR of 0.14 in APZ 1 and 0.28 in APZ 2.
9. Maximum FAR of 0.22.
10. Maximum FAR of 0.24.
11. Maximum FAR of 0.28.
12. Low intensity office uses only. Accessory uses such as meeting places, auditoriums, etc. are not recommended.
13. Maximum FAR of 0.22 for “General Office/Office Park.”
14. Office uses only. Maximum FAR of 0.22.
15. No Chapels are allowed within APZ 1 or APZ 2.
16. Maximum FAR of 0.22 in APZ 2.
17. Maximum FAR of 1.0 in APZ 1 and 2.0 in APZ 2.
18. Maximum FAR of 0.11 in APZ 1 and 0.22 in APZ 2.
19. Facilities must be low intensity, and provide no tot lots, etc. Facilities such as clubhouses, meeting places, auditoriums, large classes, etc. are not recommended.
20. Includes livestock grazing but excludes feedlots and intensive animal husbandry. Activities that attract concentrations of birds creating a hazard to aircraft operations should be excluded.
21. Includes feedlots and intensive animal husbandry.
22. Maximum FAR of 0.28 in APZ 1 and 0.56 in APZ 2. No activity which produces smoke, glare or involves explosives.
23. Lumber and timber products removed due to establishment, expansion, or maintenance of Clear Zones will be disposed of in accordance with appropriate DOD Natural Resources Instructions.
24. Controlled hunting and fishing may be permitted for the purpose of wildlife management.
25. Naturally occurring water features (e.g., rivers, lakes, streams, wetlands) are compatible.
26. a. Although local conditions regarding the need for housing may require residential use in these zones, residential use is discouraged in DNL 65-69 and strongly discouraged in DNL 70-74. The absence of viable alternative development options should be determined and an evaluation should be conducted prior to approvals indicating that a demonstrated community need for the residential use would not be met if development were prohibited in these zones.
    b. Where the community determines that residential uses must be allowed, measures to achieve outdoor to indoor Noise Level Reduction (NLR) of at least 25 dB (DNL 65-69) and 30 dB (DNL 70-74) should be incorporated into building codes and be considered in individual approvals; for transient housing a NLR of at least 35 dB should be incorporated in DNL 75-79.
    c. Normal permanent construction can be expected to provide an NLR of 20 dB; thus, the reduction requirements are often stated as 5, 10 or 15 dB over standard construction and normally assume mechanical ventilation, upgraded Sound Transmission Class (STC) ratings in windows and doors and closed windows year round. Additional consideration should be given to modifying NLR levels based on peak noise levels or vibrations.
    d. NLR criteria will not eliminate outdoor noise problems. However, building location and site planning, design and use of berms and barriers can help mitigate outdoor exposure, particularly from ground level sources. Measures that reduce noise at a site should be used wherever practical in preference to measures which only protect interior spaces.
27. Measures to achieve NLR of 25 must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-

Table B-1 Land Use Compatibility Recommendations

Land Use		Accident Potential Zones1			Noise Levels			
SLUCM No.	Name	Clear Zone	APZ 1	APZ 2	65-70 DNL	70-75 DNL	75-80 DNL	80-85 DNL

sensitive areas or where the normal noise level is low.

28. Measures to achieve NLR of 30 must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas or where the normal noise level is low.
29. Measures to achieve NLR of 35 must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas or where the normal noise level is low.
30. If project or proposed development is noise sensitive, use indicated NLR; if not, land use is compatible without NLR.
31. Land use compatible provided special sound reinforcement systems are installed.
32. Residential buildings require an NLR of 25.
33. Residential buildings require an NLR of 30.
34. Residential buildings not permitted.
35. Land use not recommended, but if the community decides use is necessary, hearing protection devices should be worn by personnel.

Key:

25, 30 or 35	=	Land use and related structures generally compatible; measures to achieve NLR of 25, 30 or 35 must be incorporated into design and construction of structure.
N (No)	=	Land use and related structures are not compatible and should be prohibited.
NLR (Noise Level Reduction)	=	Noise Level Reduction (outdoor to indoor) to be achieved through incorporation of noise attenuation into the design and construction of the structure.
SLUCM	=	Standard Land Use Coding Manual.
Y (Yes)	=	Land use and related structures compatible without restrictions.
DNL	=	Day-night average sound level.
DNL	=	Day-night average sound level.
NA	=	Not Applicable (no data available for that category).

Source: U.S. Department of the Navy 2002.

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