AICUZ Update

NAS Key West, Florida

FINAL SUBMISSION

Final Submission

AICUZ Update for NAS Key West

Monroe County, Florida

March 2007

Prepared by:

The Louis Berger Group

Under the direction of:

Naval Facilities Engineering Command

Prepared by:

The Louis Berger Group, Washington, DC

Under the direction of:

Naval Facilities Engineering Command

The following individuals and organizations made major contributions to the effort:

Naval Facilities Engineering Command

Mr. Richard Jolly

NAS Key West

Mr. Ron Demes

CDR Michael Kutyba, USN

LT Paul Kite, USN

Mr. Richard Ruzich

The Louis Berger Group

Mr. Tom Horsch, Project Manager/Senior Planner

Mr. Gregory Dorn, Senior Planner/GIS Specialist

Wyle Laboratories

Mr. Koffi Amefia, Aircraft/Airfield Noise Specialist

Page

Page

Page

List of Tables

TABLE OF CONTENTS

Page

List of Figures

Acronyms

Acronyms (Continued)

FLIP ..... Flight Information Publications
FRC ..... Fleet Readiness Center
FRS ..... Fleet Replacement Squadron
GCA ..... Ground Controlled Approach
GCI. ..... Ground Control Intercept
GSE ..... Ground Support Equipment
HIRL ..... High Intensity Runway Lights
IFR . ..... Instrument Flight Rules
JRB. ..... Joint Reserve Base
Ldn . ..... Day-night Average Sound Level (Mathematical Symbol)
LSO ..... Landing Signal Officer
MSL ..... Mean Seal Level
NAS ..... Naval Air Station
NATOPS ..... Naval Air Training & Operating Procedures & Standardization
NAVAIR ..... Naval Air Systems Command
NAVFAC or NAVFACENGCOM ..... Naval Facilities Engineering Command
NASKWINST ..... Naval Air Station Key West Instruction
NEPA ..... National Environmental Policy Act
NC .. .. Compressor Revolutions Per Minute
NLR ..... Noise Level Reduction
NM . ..... Nautical Miles
NLMOD ..... Naval Atlantic Meteorological and Oceanographic Detachment
NOAA ..... National Oceanic and Atmospheric Administration
NOTAM ..... Notice to Airmen
NQX ..... Airport Code for Boca Chica Field
NS .. .. Naval Station
OOD ..... Officer of the Day
OPAREA ..... Key West Operating Area
OPNAVINST ..... Chief of Naval Operations Instruction
PAO ..... Public Affairs Officer
PAR ..... Precision Approach Radar
PAS ..... Procedure and Standardization
PNdB ..... Perceived Noise Decibels
POLS ..... Portable Optical Landing Systems
RV .. .. Recreational Vehicle
R-2901 ..... Restricted Airspace 2901
SEL ..... Sound Exposure Levels
SLUCM ..... Standard Land Use Coding Manual
SUA ..... Special Use Airspace
T&G ..... Touch and Go
TACAN ..... Tactical Air Navigation
TCTS ..... Tactical Combat Training System
TDR ..... Transfer of Development Rights
TRS ..... Training Resource Strategy
USAF ..... United States Air Force
USC ..... United States Code
USGS ..... United States Geological Survey
VFR ..... Visual Flight Rules
VHF ..... Very high Frequency
VOR ..... Variable Omni-Directional Range

Acronyms (Continued)

VMC ..... Visual Meteorological Condition
W-174 ..... Warning Area 174
W-465 ..... Warning Area 465

This page intentionally left blank.

Background

An F/A-18F Super Hornet assigned to Air Test and Evaluation Squadron Nine (VX-9) in China Lake, California, enters the break at NAS Key West during training in 2006.

Most airfields attract development. Housing is constructed for airfield employees who want to live near by, and businesses are established to cater to the airfield and surrounding populations. As development encroaches upon the airfield, more people experience the noise and accident potential associated with aircraft operations. Incompatible development, a form of encroachment, has become commonplace on privately owned lands in the vicinity of military air installations. The Department of the Navy is particularly susceptible to such encroachment with many of its installations located in coastal areas that are desirable to work and live.

This Air Installations Compatible Use Zones (AICUZ) Update includes the Navy's air installation in Monroe County, Florida—Naval Air Station (NAS) Key West's Boca Chica Field. The study examines various airfield planning parameters related to aircraft operations, noise, and safety, and it provides recommendations that can be used to further promote compatible land use surrounding the airfield.

An AICUZ study was originally prepared and approved for NAS Key West's Boca Chica Field in 1977. Monroe County subsequently evaluated the AICUZ recommendations and enacted compatible land use provisions into their zoning ordinance. These provisions remain in place to this day.

In May of 2004, an AICUZ Update for NAS Key West was approved by the Chief of Naval Operations. The AICUZ Update superseded the 1977 AICUZ and addressed aircraft noise, aircraft safety, and land use compatibility in the vicinity of the installation. Continued dialog between NAS Key West command, local government and community officials in the City of Key West and Monroe County with respect to the 2004 AICUZ Update resulted in this document. This document is an update to the 2004 AICUZ study. The new AICUZ footprint is shown in Figure ES-1.

Noise

As a part of this AICUZ Update, a noise study was conducted. The noise study contains calendar year 2001 (CY01) and 2007 (CY07) noise contours for aircraft operations associated with the use of NAS Key West. The noise contours depicted in the 2004 AICUZ were updated to reflect the operational alternative of shortening the approach and pattern to Runway 07. The result is a pull back in the contours near Key Haven, Raccoon Key, and Stock Island.

Safety

Accident Potential Zones (APZs) are based on historical accident and operations data throughout the Armed Services and the application of margins of safety within these areas (which have been determined to be probable impact areas) if an accident were to occur. The APZs contained in the 2004 AICUZ are the same with the exception of the APZs associated with arrival and pattern flight tracks for Runway 07. With respect to the 1977 AICUZ, changes in criteria used to determine APZs and updated operations data have resulted in changes in APZs.

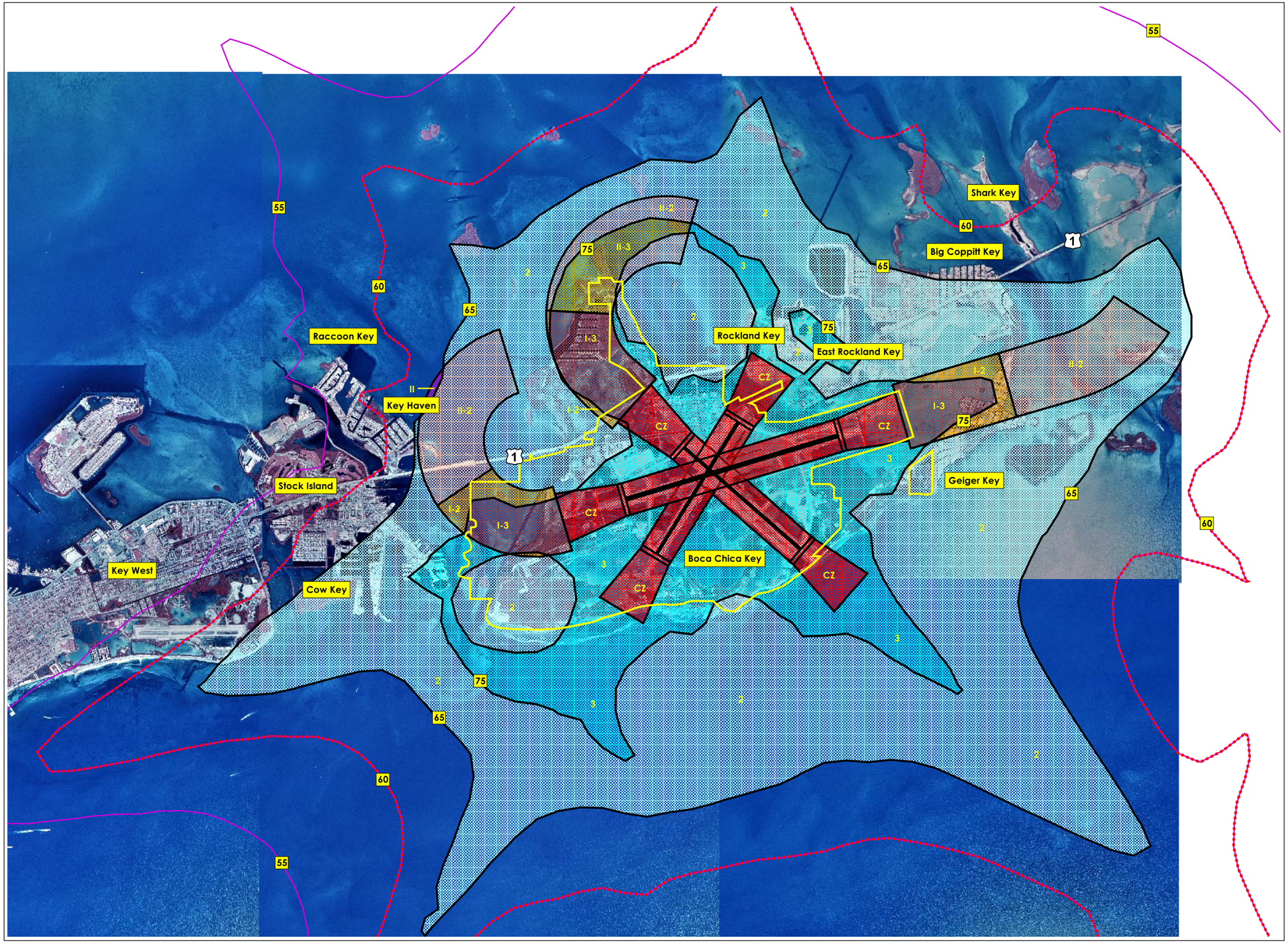
F-16 Fighting Falcons from the 62nd Fighter Squadron, Luke Air Force Base, Arizona., fly over southern Florida during a flight to Key West, Florida., recently. The 62nd Fighter Squadron deployed to NAS Key West to fly training missions with Navy F-18 pilots.

Land Use

The AICUZ footprint is a combination of noise impact and APZs. The majority of non-Navy owned lands are developed within the updated AICUZ footprint. Compatible use in future development around the airfield is the overall goal of the AICUZ program at NAS Key West. An updating of zoning and land use regulations to reflect the new AICUZ footprint and land use compatibility recommendations will work to encourage compatible land use near the airfield.

Recommendation

Continue working with Monroe County and the City of Key West to update local land use regulations to promote compatible future development around NAS Key West's Area of Responsibility (AOR).



NAVAL AIR STATION KEY WEST FLORIDA

Figure ES-1

CY07 AICUZ and Aerial Image

	Primary Surface/ Clear Zone	APZ I	APZ II	
Noise Zone 1 (< 65 Ldn)	N/A	N/A	II	N/A
Noise Zone 2 (65-75 Ldn)	CZ	I-2	II-2	2
Noise Zone 3 (> 75 Ldn)	CZ	I-3	II-3	3

AICUZ Footprint

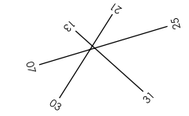
55 Ldn

Airfield Boundary (Approximate)

Notes

AICUZ Air Installations Compatible Use Zones
APZ Accident Potential Zone
CZ Clear Zone
Ldn Day-Night Average Sound Level

NAS Runways



0 2000 4000 Feet

Sources

NAS Key West, 2003/2005
USGS 1:24,000 DOQ, 2000

1.0 Introduction

Most airfields attract development. Housing is constructed for airfield employees who want to live near by and businesses are established to cater to the airfield and surrounding residents. As development encroaches upon the airfield, more people experience the noise and accident potential associated with aircraft operations. Incompatible development, a form of encroachment, has become commonplace on privately owned lands in the vicinity of military air installations. The Department of the Navy is particularly susceptible to such encroachment with many of its installations located in coastal areas that are desirable to work and live in. Naval Air Station (NAS) Key West located in the Florida Keys is a good example of an air station located in a coastal area that is desirable to both work and live.

This AICUZ Study Update focuses on the Navy's air installation in Monroe County, Florida—NAS Key West's Boca Chica Field.

The primary goal of the Navy and Department of Defense's (DOD) 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 operational capability of the airfield. The AICUZ program works to meet this goal and to achieve land use compatibility by recommending land uses that will be compatible with noise levels, accident potential, and flight clearance requirements associated with aircraft operations.

This AICUZ Study Update includes the Navy's air installation in Monroe County, Florida—NAS Key West's Boca Chica Field. The analysis uses operations numbers, flight track, and flight procedure information provided by the Navy and validated by NAS Key West, Commander Navy Region Southeast, and Commander Fleet Forces Command (CFFC) [1]. The analysis also uses information obtained from sources such as Monroe County, City of Key West, and U.S. Census Bureau. The information contained in this study serves as an update to the 2004 AICUZ study for the airfield[2].

The evolution of naval aviation, coupled with various base consolidation efforts since the original AICUZ study for NAS Key West was prepared nearly 30 years ago, has impacted the role this station plays in support of the Navy. Due to the excellent flying conditions, airspace, and range availability, today's airfield plays a vital role in the training of DOD, Federal agency, and allied nation aviators. A snap shot of changes in aircraft and in deployment of transient aircraft was evaluated in this study and compared with that found in the 1977 AICUZ study.

This section of the study provides background on the AICUZ Program and describes NAS Key West and Boca Chica Field. Section 2.0 discusses airspace associated and flight procedures at the airfield. Section 3.0 discusses aircraft types and aircraft operations. Section 4.0 presents aircraft noise zones– how noise zones are determined. Section 5.0 discusses aircraft safety issues including flight clearance requirements and Accident Potential Zones (APZs). Section 6.0 presents AICUZ footprint maps and guidelines for compatible land use. Section 7.0 discusses surrounding land uses in the Boca Chica Field environs. Section 8.0 provides land use compatibility strategies and specific recommendations that can be used to promote land use compatibility consistent with the recommendations of the AICUZ Program.

[1] The calendar year 2007 (CY07) projected condition represents the Navy's complete transition from F-14 Tomcat aircraft operations to F/A-18C/D and F/A-18E/F aircraft operations. In the calendar year 2001 (CY01) condition, F-14 aircraft accounted for 21% of the overall operations at NAS Key West. In CY07, F-14 aircraft are no longer in operation and account for 0% of the overall operations. The last official Navy flight of an F-14 was on July 28, 2006 and took place via a carrier off the coast of Virginia.
[2] NAS Key West AICUZ Update, 2004.

1.1 The AICUZ Program Purpose and Scope

In the 1970s, the Department of Defense (DOD) initiated the AICUZ Program to balance the requirement for adequate aircraft training capabilities at airfields with community concerns over aircraft noise and accident potential generated by this training. The key to the program's success is found in intergovernmental coordination, which occurs once AICUZ studies are approved and released to the public. An active local command effort to work with surrounding communities in preventing incompatible development in the vicinity of military airfields is the foundation of the program's success.

The Navy has identified the following components of the AICUZ Program:

a. To develop, and periodically update, a study and accompanying map for each air installation to quantify and depict aircraft noise zones and APZs;

b. To coordinate with federal, state, and local officials to encourage compatible land use development around the air installation;

c. To inform the local community of the importance of maintaining the Navy's ability to conduct aircraft operations; and

d. To review operations and implement operational changes in noise abatement strategies that would reduce noise impacts while insuring mission requirements.

Under the AICUZ Program, DOD identifies noise contours as a planning tool for local planning agencies. DOD measures the noise exposure using the day-night average sound level (DNL)[3]. The DNL noise metric averages noise events that occur over a 24-hour period. Aircraft operations conducted at night (10:00 p.m. to 7:00 a.m.) are weighted because people are more sensitive to noise during sleeping hours, when ambient noise levels are lower. The DNL contours are displayed on a map and grouped to form noise zones that show the level of noise exposure in the surrounding communities.

The DOD also identifies APZs as a planning tool for local planning agencies. APZs are areas where an aircraft mishap is most likely to occur if one occurs. They do not reflect the probability of an accident. APZs follow departure, arrival, and flight pattern tracks and are based on analysis of historic data. The AICUZ includes three APZs—the Clear Zone, APZ I, and APZ II. The Clear Zone extends 3,000 feet beyond the runway end and has the highest potential for accidents. APZ I generally extends 5,000 feet beyond the Clear Zone, and APZ II extends 7,000 feet beyond APZ I. APZs may bend along flight paths to more effectively reflect operations. An accident is more likely to occur in the Clear Zone than in either APZ I or APZ II.

Land use development should be compatible with noise zones and APZs around a military airfield. The Federal Aviation Administration (FAA) and the DOD also encourage local communities to restrict development or land uses that could endanger aircraft in the vicinity of the airfield, including:

- Lighting (direct or reflected) that would impair pilot vision;
- Towers, tall structures, and vegetation that penetrate navigable airspace or are to be constructed near the airfield;
- Uses that would generate smoke, steam, or dust;
- Uses that would attract birds, especially waterfowl; and,
- Electromagnetic interference with aircraft communications, navigation, or other electrical systems.

[3] For a detailed explanation of measuring noise exposure using DNL, see Section 4.

1.2 Purpose, Authority, and Scope

The Navy implemented the AICUZ Program at NAS Key West (Boca Chica Field) to encourage, through local cooperation, compatible development in and around the Navy airfield located in Monroe County, Florida. The program was initiated locally with the Navy's adoption of the 1977 AICUZ Study. The 1977 AICUZ was updated in 2004. The purpose of this study is to update the 2004 AICUZ to reflect an operational alternative implemented subsequent to the 2004 study.

The following provide guidance in implementing portions of the AICUZ Program:

- U.S. DOD, *Instruction 4165.57, Air Installations Compatible Use Zones*, November 8, 1977[4];
- Chief of Naval Operations Instruction (OPNAVINST), *OPNAVINST 11010.36B, Air Installations Compatible Use Zones Program (AICUZ)*, dated December 19, 2002[5];
- U.S. DOD *Unified Facilities Criteria (UFC) 3-260-1 Airfield and Heliport Planning and Design,* November 1, 2001[6]; and
- U.S. Department of Transportation, FAA Regulations, *Code of Federal Regulations (CFR), Title 14, Part 77, Objects Affecting Navigable Airspace*, 1992[7].
- Naval Facilities Engineering Command (NAVFAC), *NAVFAC Instruction P-80.3, Airfield Safety Clearances*, January, 1982[8].

1.3 Responsibility for Compatible Land Use

Air installations and local government agencies with planning and zoning authority share the responsibility for preserving land use compatibility near the air installation. Cooperative action by both parties is essential to prevent land use incompatibility and encroachment. If local governments choose not to implement land development controls within the airfield environment, or are incapable of doing so, the Navy may acquire property rights to protect its operational integrity.

NAS Key West has a twofold responsibility within the AICUZ Program. First, it looks to reduce aircraft noise impacts, to the extent feasible without compromising flight safety or operational capability, through operational guidance and procedures. Second, the air installation command works with state and local community leaders and planning officials to implement the objectives of the AICUZ Program and strives to educate and inform the local civilian community of the mutual benefits of an effective AICUZ Program.

The local governments have the responsibility to protect the health, safety, and welfare of their respective residents. The land use focus is on Monroe County, Florida and the City of Key West. The current County adopted land use provisions related to AICUZ are dated 1989[9] and contained in Appendix A.

[4] U.S. DOD, *Instruction 4165.57, Air Installations Compatible Use Zones*, November 8, 1977.
[5] Chief of Naval Operations Instruction (OPNAVINST), *OPNAVINST 11010.36B, Air Installations Compatible Use Zones Program (AICUZ)*, December 19, 2002.
[6] U.S. DOD, *Unified Facilities Criteria (UFC) 3-260-1 Airfield and Heliport Planning and Design*, November 1, 2001.
[7] U.S. Department of Transportation, FAA Regulations, *Code of Federal Regulations (CFR), Title 14, Part 77, Objects Affecting Navigable Airspace*, 1992.
[8] Naval Facilities Engineering Command (NAVFAC), *NAVFAC Instruction P-80.3, Airfield Safety Clearances*, January, 1982.
[9] AICUZ language/regulations contained in Monroe County Code of Ordinances, Land Development Regulations, Section 9.5-252, Airport Districts, 1989. See Appendix A.

1.4 State and Local Authority

NAS Key West is located in Monroe County, Florida.

Governmental regulation of land use in Florida has traditionally been a responsibility of local governments. Land use regulation and controls such as zoning ordinances, subdivision ordinances, and building code adoption and enforcement are all within the authority of the local jurisdictions.

In addition, federal, state, and regional planning programs and policies have been established to encourage growth and management of environmentally sensitive areas. The State of Florida revised their Local Government Comprehensive Planning and Land Development Regulation Act in 1985[10]. This act requires local jurisdictions including Monroe County and the City of Key West to create comprehensive plans, submitting them to the state for approval. The Florida Department of Community Affairs reviews plans and local regulations and provides assistance to regional planning entities on land use, environmental, and transportation coordination issues. Another statewide initiative, the Areas of Critical State Concern Program[11] was established to protect resources and public facilities of major statewide significance. The program requires a review of plans and major developments within designated areas including the environs around NAS Key West. This state program is coupled with efforts to protect coastal resources through the Florida Coastal Management Program[12]. The Florida Coastal Management Program is implemented through 23 federal, state, and local statutes, and works to protect environmental, economic, and cultural resources in coastal areas. In 2004, the State of Florida Legislature enacted Section 163.3175, Florida Statutes, that works to promote compatible development with military installations and the exchange of information between local governments and military installations (See Section 8.1.2 and Appendix F for further details).

The State of Florida does not exert formal control over airport planning, granting authority for such actions to the local jurisdictions. The local governments establish ordinances and plans governing the coordination of land uses in airport environs. Monroe County and the City of Key West are the local jurisdictions that establish these ordinances and plans near NAS Key West. Another airport, Key West International Airport, is located approximately three miles west of Boca Chica Field and is within the City of Key West jurisdictional boundary.

1.5 Changes that Require an AICUZ Update

NAS Key West entered into dialog with the local government officials regarding the 2004 AICUZ update per Chief of Operations approval letter of May 25, 2004. The flight track for the approach to runway 07 was subsequently shortened from the standard flight track used. This change had a negative impact on NAS Key West air operations but was modified by the Navy due to several key factors. The factors include: the majority of operations using the airfield are by tactical military aircraft capable of tighter turns; pilots using the airfield are experienced in tactical maneuvers; weather for Boca Chica Field provides for 97% VFR flight conditions; and the pattern could be managed through a modification of

[10] State of Florida Local Government Comprehensive Planning and Land Development Regulation, 1985. http://www.dca.state.fl.us/programs.cfm
[11] Areas of Critical State Concern Program, State of Florida. http://www.dca.state.fl.us/programs.cfm
[12] Coastal Management Program, State of Florida. http://www.dca.state.fl.us/fdcp/DCP/programs/index.htm

course rules, thorough flight briefings and aggressive air traffic control procedures. As discussed later in the document, a flight track only approximates the center of a flight pattern that actually represents a band of flights generated when using a particular approach or pattern. Depending on types and numbers of aircraft using a particular pattern and various other factors, the track may vary significantly. This variance will occasionally result in a flight outside the band. It should be noted that if the type and numbers of military aircraft currently operating from NAS Key West changes in the future, the impact of this flight track reduction may prove to be more severe thus causing the Navy to revisit the flight track for Runway 07.

1.6 Mission and Need

Mission

NAS Key West's national security mission supports operational and readiness requirements for Department of Defense, Department of Homeland Security, National Guard units, Federal Agencies and Allied forces.

As such NAS Key West is the Navy's premier East Coast transient pilot training facility for tactical aviation squadrons[13]. The airfield hosts aviation squadrons from around the country on a regular basis to fulfill the mission. Customers include active and reserve fighter/strike fighter communities, Chief of Naval Training (CNATRA) units, Fleet Replacement Squadrons (FRSs), and other military service users. Aircraft squadron VFC-111 was established in June 2006 as an adversary squadron in Key West. NAS Key West is also host activity to numerous tenant commands supporting such critical missions as unique naval research, development testing, counter-drug operations, and special warfare training.

NAS Key West is the closest military installation in the United States to Cuba. For that reason, NAS Key West has significant military and homeland security strategic importance.

Need

DOD needs to ensure the continued capability of NAS Key West to support mission requirements while promoting the compatible growth and development of the surrounding community. The Navy refers to this as sustainable readiness and cites the following reasons for continued use of NAS Key West:

- The world remains a dangerous place.
- The nation needs forces at a high state of readiness.
- Readiness is only obtained with continual high quality training and modernization.
- Section 5062 Title 10 U.S. Code directs the Chief of Naval Operations (CNO) to train all Naval forces for combat.

NAS Key West is an integral and recognized part of the Key West/Monroe County community and local economy. The on-site military and civilian employment population at NAS Key West is approximately 900 personnel[14]. In addition to NAS Key West personnel, approximately 1,100 persons are employed by NAS Key West tenants.

[13] *NAS Key West Regional Shore Infrastructure Plan (RSIP)*, 2003.
[14] *NAS Key West Regional Shore Infrastructure Plan (RSIP)*, 2003.

1.7 Location and Meteorology

The NAS Key West Complex is located approximately 156 miles southwest of Miami and 90 air miles north of Cuba. Key West is the closest point in the United States to Cuba. For that reason, NAS Key West has significant military and homeland security strategic importance.

NAS Key West consists of approximately 6,000 acres with facilities located in 13 different areas of the lower Florida Keys. Boca Chica Field, NAS Key West's primary site and airfield, is located on Boca Chica Key. Boca Chica Field is approximately three miles east of the City of Key West and is located in Monroe County, Florida as illustrated in Figure 1-1. Boca Chica Field consists of approximately 4,700 acres and encompasses nearly the entire key. The Navy purchased over 617 acres of undeveloped land on Boca Chica and Geiger Keys in the 1980s and early 1990s[15]. The Navy also has a compatible development agreement[16] over a privately owned area on the northwest end of Boca Chica Key.

The NAS Key West Complex is also located on and over the waters of the Gulf of Mexico and includes instrumented ranges, target areas, and non-instrumented warning areas. These areas include the Key West Tactical Combat Training System (TCTS), Warning Area 174 (W-174), Warning Area 465 (W-465), Key West Operating Area (OPAREA), and Bonefish Air Traffic Control Assigned Airspace (ATCAA). These features of the NAS Key West Complex are further described and illustrated throughout Section 2 Airspace.

Flying weather is exceptionally good with marginal weather occurring less than one percent of the time. While humidity remains relatively high during the entire year, fog is quite rare, occurring only once or twice per year. The excellent flying weather, coupled with the air stations suite of airfield facilities and variety of airspaces, makes NAS Key West an important and attractive location for temporary training deployments and a multitude of operations.

Key West has a notably mild tropical-maritime climate due in no small part to its proximity to the Florida Current located in the Straits of Florida approximately 12 miles to the south and southeast, and the tempering effects of the Gulf of Mexico to the west and north. The average monthly low temperature during the winter is only 15 degrees Fahrenheit lower than in the summer—74 degrees and 89 degrees Fahrenheit respectively. There is no known record of frost, ice, sleet, or snow in Key West. Prevailing easterly trade winds suppress the usual summertime heating. Diurnal variations throughout the year average only about ten degrees.

There are two distinct and alternating seasons in Key West; dry and wet. The dry season extends from December through April during which NAS Key West receives abundant sunshine and approximately 22% of its annual rainfall (yearly average is slightly over 40 inches). This rainfall usually occurs in advance of cold fronts. The rainy season is from May through October. During this period, the numerous showers and thunderstorms account for over three-quarters of the average annual rainfall, with early morning being the most favorable time for showers. Easterly waves are common during this season and bring an abundance of rainfall. The Hurricane season coincides with the rainy season and extends from 1 June through 30 November– middle August to early October are the months with the highest probability of a tropical disturbance affecting the Key West area. Thunderstorms occur in the Key West area every month of the year, but are most prominent during the months of July, August and September.

It is noteworthy that the National Weather Service has identified Key West as the most hurricane-prone area in the United States. Hurricanes are of grave importance to the residents of the Florida Keys; especially in view of the fact that the only land-based egress to a safe haven includes overseas portions of U.S. Highway 1.

[15] NAS Key West Fee Acquisition Maps as tabulated by NAS Key West personnel, 2003.
[16] Agreements for areas of Boca Chica Key, 1980s and 1990s. See Appendix B.

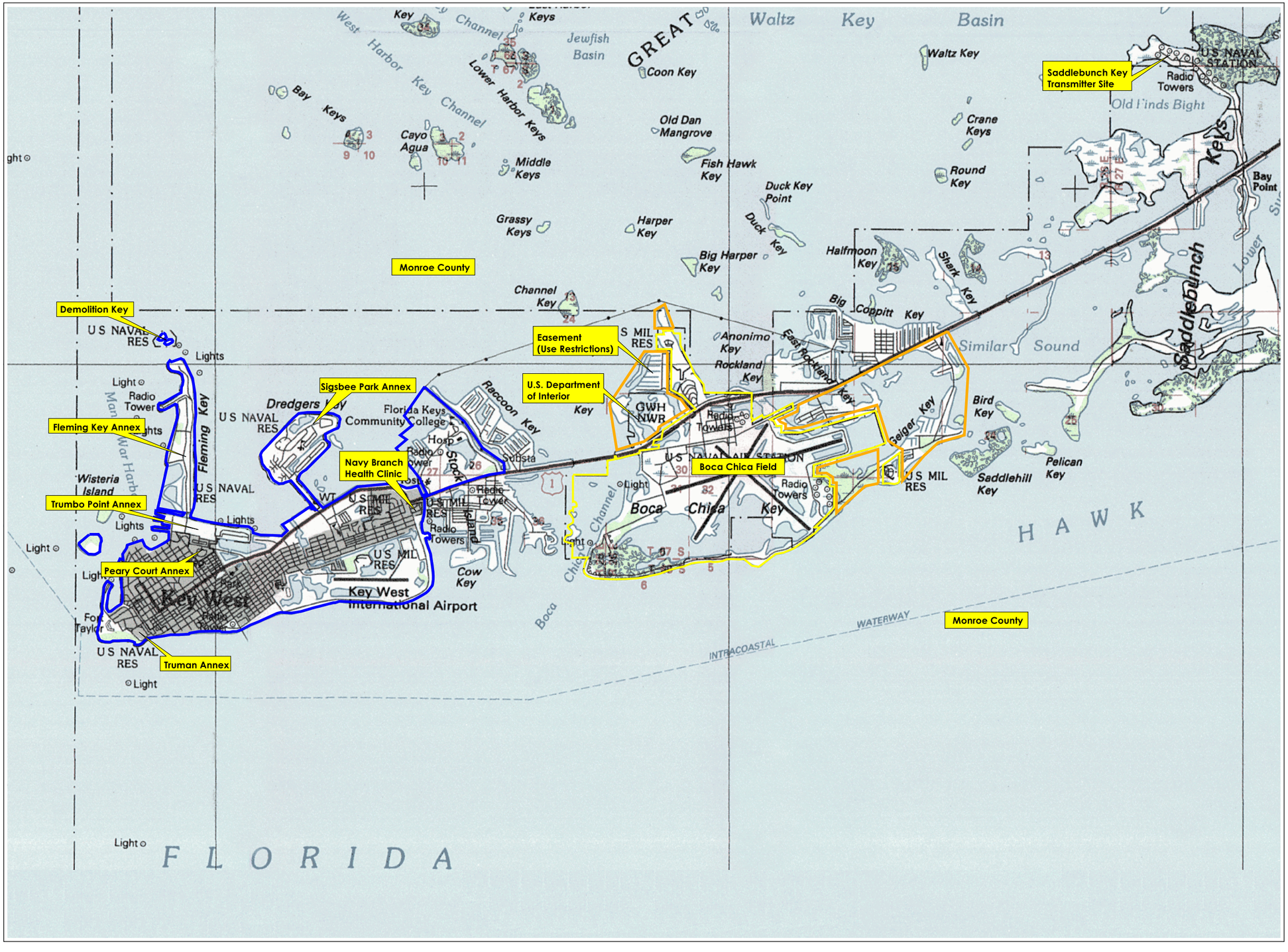
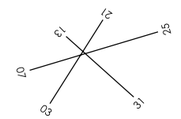


Figure 1-1
Location Map

Legend
- Airfield Boundary (Approximate)
- City of Key West Boundary
- Existing undeveloped lands in these areas are either owned by the Navy, State of Florida, or U.S. Department of Interior or development restrictions are in effect.

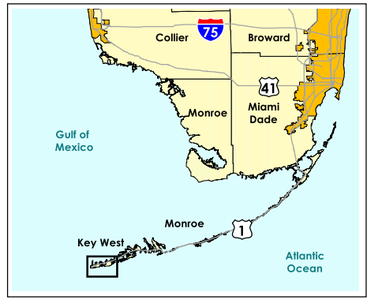
NAS Runways



N

0 2500 5000 Feet

Southern Florida Key Map



Sources
NAS Key West 2003
USGS 1:100,000 DRG

1.8 Airfield Facilities

Since the first runway for land-based aircraft was paved on Boca Chica Key in the early years of World War II, the airfield has evolved into a premier air operations facility. Today, Boca Chica Field has three asphalt runways: primary Runway 07/25 is 10,000 feet by 200 feet and crosswind Runways 03/21 and 13/31 are both 7,000 feet by 150 feet. Figure 1-2 is an aerial image of Boca Chica Field. Figure 1-3 provides a National Oceanic and Atmospheric Administration (NOAA) airfield diagram of Boca Chica Field.

The following details the NAS Key West's Boca Chica Field facilities per NAS Key West Instruction (NASKWINST) 3710.2Q[16]:

Geographic Description

- Latitude/Longitude. 24^{O} 34' north/81^{O} 41' south.
- Airfield Elevation. Field elevation is 6 feet Mean Sea Level (MSL).
- Visual Meteorological Condition (VMC) Flying Conditions. Ninety-eight percent of the time.

Airfield

- Normal Operating Hours. Normal airfield operating hours are 0700 to 2200 hours seven days per week. However, it is noted that when operational requirements arise, air operations later in the night and earlier in the morning (between 2200 and 0700) do occur frequently.
- Runways. The airfield consists of three asphalt runways with concrete turn-up areas. All runways are accessible by taxiways. Runway 07/25 is 10,000 feet by 200 feet. Runway 03/21 is 7,000 feet by 150 feet. Runway 13/31 is 7,000 feet by 150 feet. Runway 07 is the designated instrument/calm wind runway and will normally be used when the surface wind is less than ten knots or at all other times if operationally advantageous.
- Arresting Gear. E-28 bi-directional arresting gear is the only type used at NAS Key West. The E-28 short field gear on the active runway is always de-rigged. The location of all E-28 gear is depicted in Figure 1-3. No overrun gear is available.
- Air-Start. An Air-Start Unit is located between the Hangar A-936 line and Taxiway A.
- Wind Sock. There is a lighted wind sock located at the approach end of all runways except Runway 13 and a large, lighted wind sock at midfield.

Hangar and Service Facilities

- Hangar Facilities. Hangar facilities for transient aircraft are available for repair.
- Parking. Parking is available for approximately 35 transient aircraft on the ramp around the Operations/Tower Building.
- Fueling. Fueling is available via truck only. Hot refueling is permitted.
- Air Starting Units. Air-Start Systems are available to detachment aircraft in the fleet hangar area.
- Compass Rose. A compass rose and electronic compass calibration site are available.
- High Power Turn-Up Areas. Two high power turn-up areas are located at the approach end of Runway 03 and Runway 31 as illustrated on Figure 1-2.

[16] Naval Air Station Key West Instruction 3710.2Q.

Airfield Lighting/Marking

- Runway Markings. All runways are marked in accordance with standard criteria. Simulated carrier decks are depicted on Runways 03 and 13 commencing approximate 100 feet from the threshold. An unlighted carrier deck is located on Runway 07. Lighted runway distance markers are located at 1,000 feet intervals along the runways.
- Runway Lights. All runways have threshold lights. All runway, taxiway, rotating beacons, boundary, and obstruction lights are of standard color.

  All runways have high intensity runway lights (HIRL).

  Runway 07 has approach lighting.

  Runways 03 and 13 have carrier deck lighting at the approach end controlled by the Landing Signal Officer (LSO).
- Obstruction Lights. Obstruction lights on the control tower antennas are photo-electrically activated. Lights on the crash crew hangar are controlled by the crash crew.
- Optical Landing System. Two portable optical landing systems (POLS) are normally available.

Meteorological Facilities

- A complete meteorological, flight weather briefing, and observation facility is available at the Naval Atlantic Meteorological and Oceanographic Detachment (NLMOD), Key West, located on the second floor of the Operations Building A-4023.

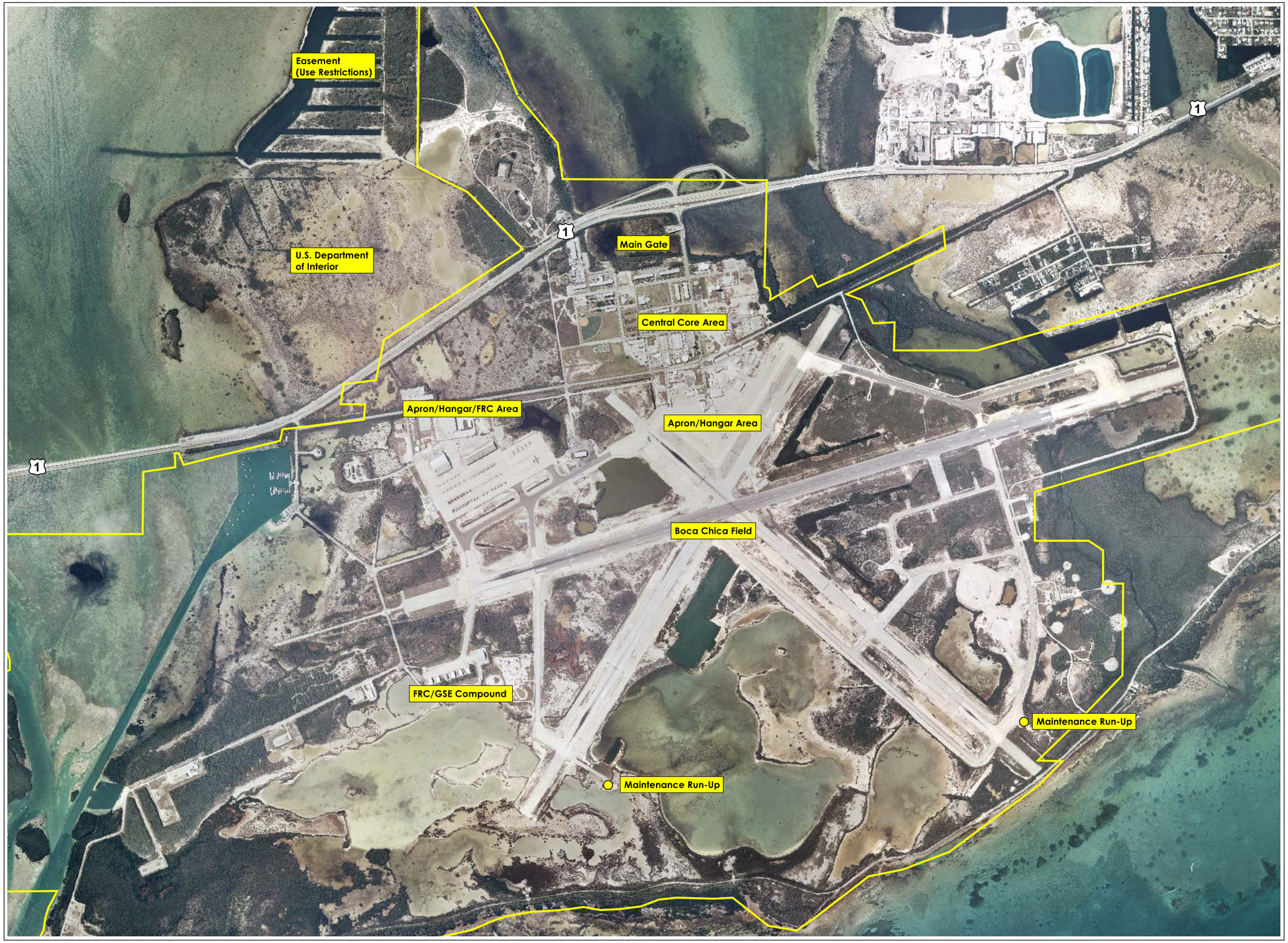


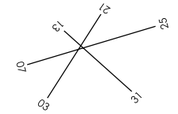
Figure 1-2

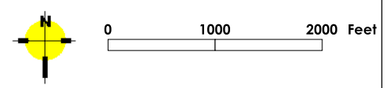
Aerial Image- Boca Chica Field

Legend

Airfield Boundary (Approximate)

NAS Runways





Sources

NAS Key West 2003

NAS Key West Image, September 2001

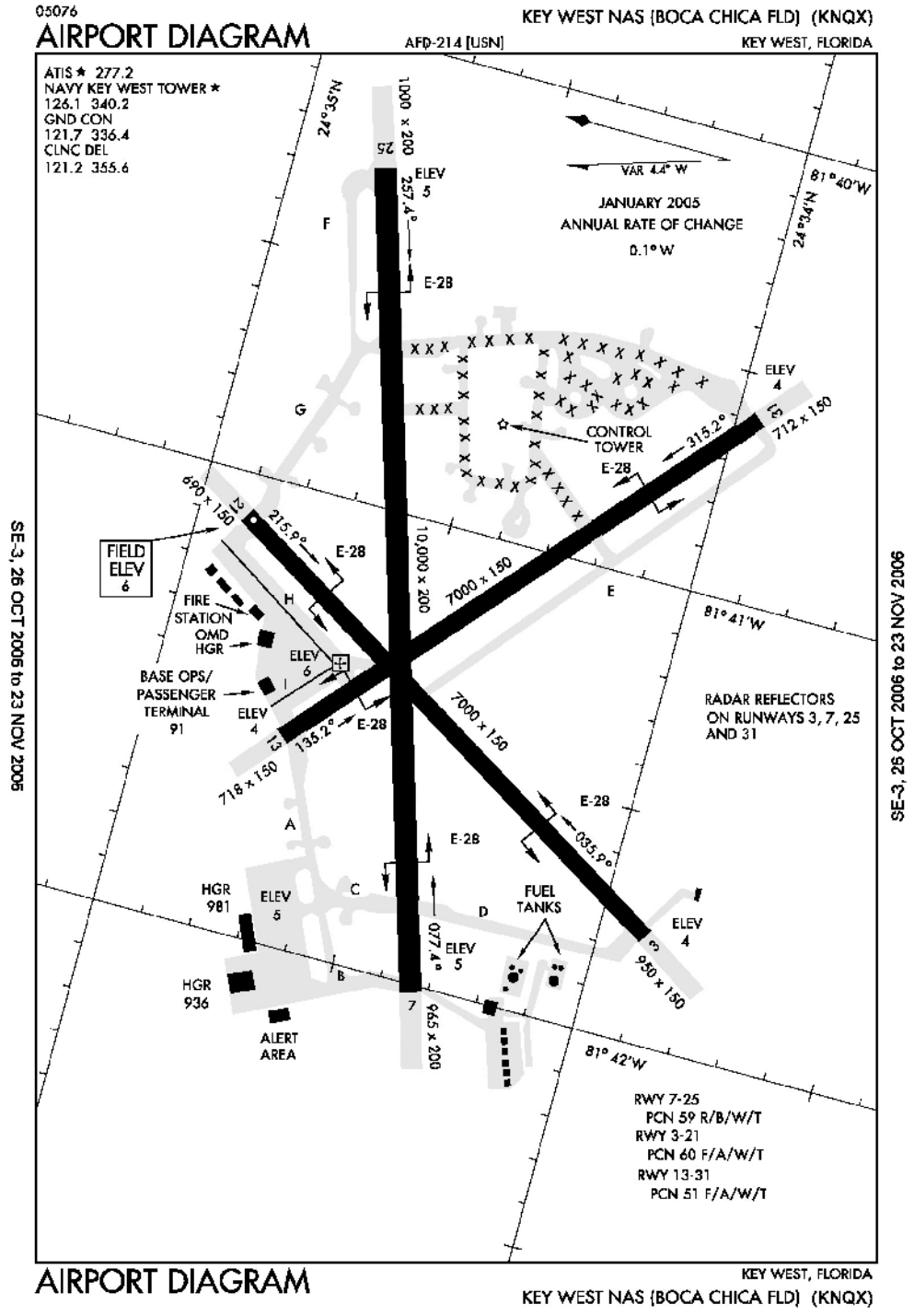


Figure 1-3 Airfield Diagram- Boca Chica Field

Source
NOAA U.S. Terminal
Procedures FLIP Chart, November 2006

2.0 Airspace

NAS Key West is known as the East Coast's premier transient pilot training facility. Training includes air to air training venue able to accommodate a variety of training exercises including air combat maneuvering (ACM), live-fire activity, and ordnance delivery. Extensive warning areas extend north, south, and west of Boca Chica Field. The areas are well instrumented and surveilled by Federal Aviation Administration (FAA) and Navy radar systems. This section describes the Key West Complex, including the regional and local airspace, and airport control zones and flight procedures at NAS Key West.

2.1 Key West Complex

The Key West Complex is located predominately over open ocean in water adjacent to the southwestern coast of Florida. The following non-instrumented warning areas, air traffic control assigned airspace (ATCAA), and operating area (OPAREA) are associated with this complex:

- Warning Area 174 (W-174)
- Warning Area 465 (W-465)
- Bonefish ATCAA
- Key West OPAREA

The complex is composed of the following instrumented target ranges and target areas:

- Marquesas "Patricia" Target
- Key West TCTS

In addition to these features of the Key West Complex, the NAS Key West regional flight area is comprised of airspace over the State of Florida within 350 nautical miles (NM) of NAS Key West. NAS Key West also lies within the Gulf of Mexico Coastal Air Defense Identification Zone (ADIZ). The Key West Complex and regional airspace surrounding NAS Key West is illustrated in Figure 2-1.

Located over open ocean, Warning Area 174 (W-174) is special use airspace (SUA)[1] divided into seven areas (W-174A/B/C/D/E/F/G) as illustrated in Figure 2-1. Instrument training, ACM, ground controlled intercept (GCI), and other exercises are conducted within W-174. Air-to-air gunnery is permitted in W-174A. Located over open water, Warning Area 465 (W-465) is also a special-use airspace. W-465 is divided into three areas (W-465A/B/C) and is primarily scheduled for ACM and instrument training flights.

The Bonefish ATCAA is a special-use airspace that provides additional airspace for aircraft training in ACM. W-465C/D and W-465A/B/C comprise the Key West OPAREA.

The Miami Air Route Traffic Control Center (ARTCC) is the controlling agency for W-174 and W-465. The Commanding Officer at NAS Key West has designated Tarpon Control (Navy Ground Controlled Intercept [GCI] Division) the scheduling authority for W-174 and W-465. Tarpon Control normally uses W-174 and W-465 from 0700 – 2300 (DST 0600 – 2200) during weekday operations. After local operations are secure, the airspace is returned to Miami ARTCC. Transient aircraft desiring to operate in W-174 or W-465 must contact the Tarpon Control scheduling office. Aircraft operating in W-174 and/or W-465 are required to maintain communications with the appropriate warning area controlling agency.

[1] FAA designates SUA to assure the safety of all airspace users by isolating military training flights from all other air traffic. SUA includes restricted areas (onshore airspace), warning areas (offshore airspace), and military operations areas (MOAs) and is depicted on aeronautical charts for reference in military, commercial, or general aviation flight planning.

The Marquesas "Patricia" Target is located in W-174E. The Patricia Target is an unattended/non-instrumented ship-hulk target located 30 nautical miles (NM) from the NAS Key West Tactical Air Navigation (TACAN) (Channel 78) bearing 269. A 2 NM-radius surface danger area surrounds the target. W-174E extends from the surface to 10,000 feet and air-to-surface exercises are authorized. The target is a grounded ship-hulk 306 feet in length and 37 feet beam. The target is visible only during low tide and does not protrude above the surface. Note: Avon Park Target Area is a second target area in the region. The target area is located in South Central Florida with Restricted Airspace 2901 (R-2901) and scheduling is accomplished through McDill Air Force Base located near Tampa, Florida. The targets at this range are fixed hard targets.

The Key West TCTS comprises the entire range including the airspace in W-174, W-465 and the Bonefish ATCAA. The range is divided into a north and south operating area. The TCTS provides aircrew training and performance evaluation in air-to-air combat.

2.2 Airport Control Zones and Flight Procedures

Boca Chica Field (designated NQX by the FAA) is located within a complex airspace that serves NAS Key West and Key West International (designated EYW by the FAA) Airport. Several other airports exist locally. Table 2-1 lists those in the vicinity of NAS Key West and their distance from Boca Chica Field.

Table 2-1 Airports Local to NAS Key West

Airport Name	Airport Ownership	Approximate Distance from NAS Key West (NM)
Key West International Airport	Public Use	3
Sugar Loaf Shores	Private	9
Summerland Key	Private	16
Florida Keys Marathon	Public Use	42
Chalk (Seaplane Base)	Private	7

Source: Miami Sectional Aeronautical Chart, 2003.

Note: NM= Nautical Mile.

NAS Key West is a FAA category D airport and Navy Class IV B approach control facility[2]. It is located within the Key West Class "D" Surface Area that extends upward from the surface to and including 2,500' mean sea level (MSL) within a 3.9 mile radius of Key West International Airport and within a 5.3 mile radius of NAS Key West. This Class "D" Surface Area is effective during the specific dates and times specified in the instrument flight rules (IFR) supplement, and at other times by notice to airmen (NOTAM).

The local airspace of NAS Key West and Key West International Airport overlap, as illustrated in Figure 2-2. NAS Key West provides approach control services for both the station and EYW within the airspace delegated by the Miami ARTCC up to and including an altitude of 16,000 feet MSL.

[2] NAVAIR 00-80-T-114.

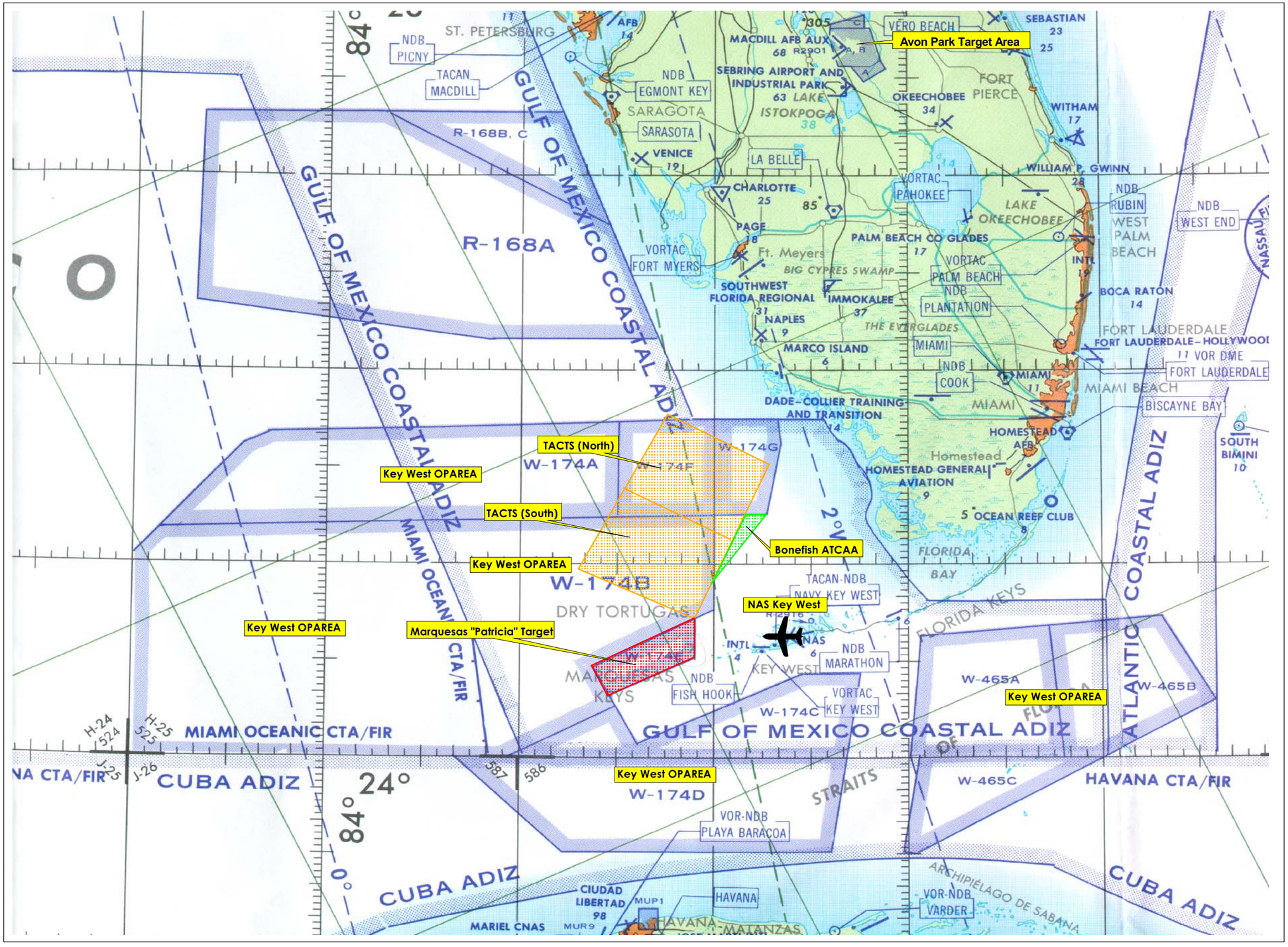


Figure 2-1

Regional Airspace and Key West Complex Map

The following non-instrumented warning areas, air traffic control assigned airspace (ATCAA), and operating area (OPAREA) are associated with this complex:

- -Warning Area 174 (W-174)
- -Warning Area 465 (W-465)
- -Bonefish ATCAA
- -Key West OPAREA

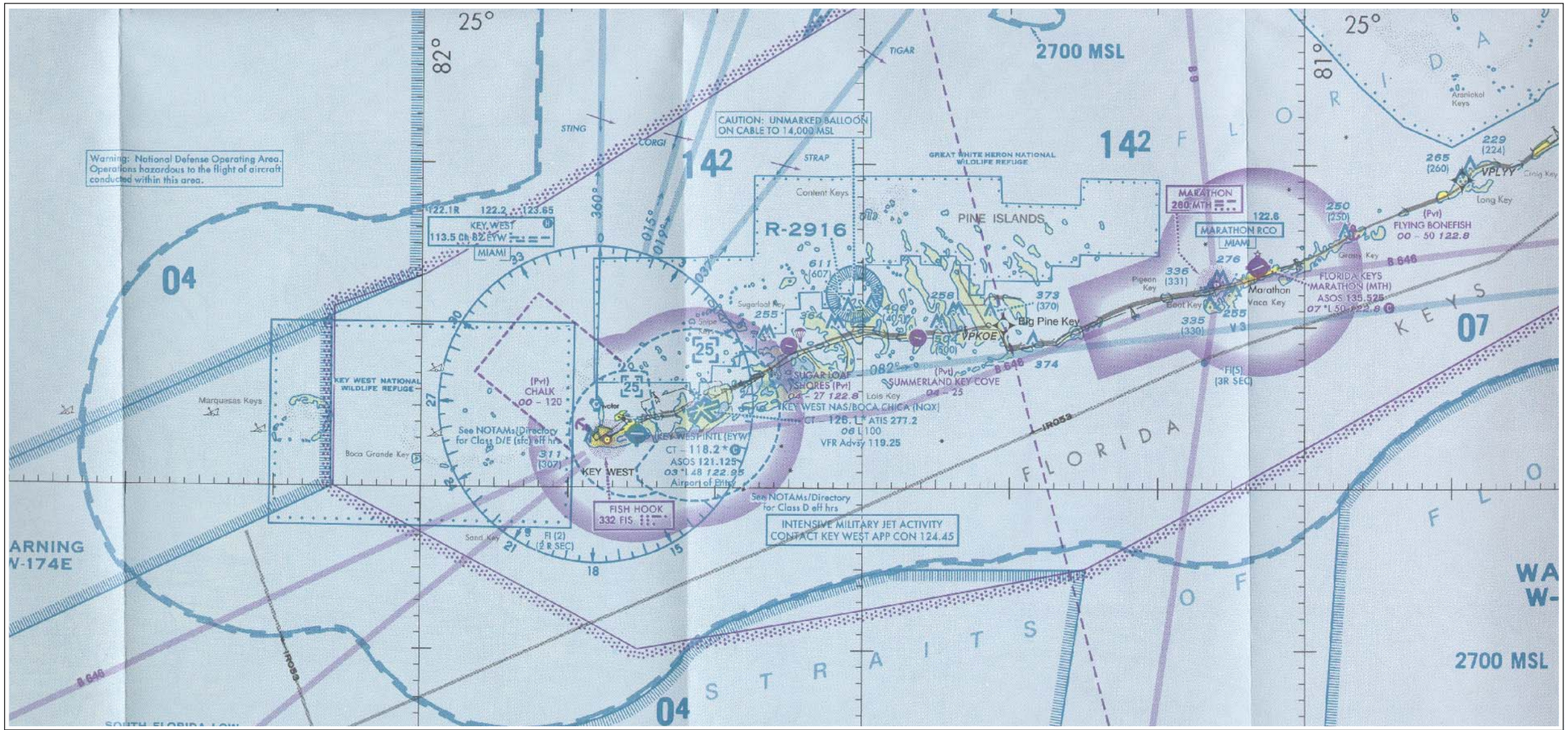
The complex is composed of the following instrumented target ranges and target areas:

- -Marquesas "Patricia" Target
- -Key West Tactical Aircrew Combat Training System (TACTS)

Note: This map should not be used for navigation purposes. Please refer to the latest NOAA Miami Sectional Aeronautical Chart for up-to-date airspace boundaries.

Not To Scale

Sources
Jet Navigation Chart, Defense Mapping Agency, 1985
Range Management Plan for Patricia Target Range, 1999



AIRPORTS

- Other than hard-surfaced runways
- Seaplane Base
- Hard-surfaced runways 1500 ft. to 8069 ft. in length.
- Hard-surfaced runways greater than 8069 ft. or some multiple runways less than 8069 ft.
- Open dot within hard-surfaced runway configuration indicates approximate VOR, VOR-DME, or VORTAC location.

All recognizable hard-surfaced runways, including those closed, are shown for visual identification. Airports may be public or private.

ADDITIONAL AIRPORT INFORMATION

- (R) Private "(Pvt)" - Non-public use having emergency or landmark value.
- Military - Other than hard-surfaced. All military airports are identified by abbreviations AFB, NAS, AAF, etc. For complete airport information consult DOD FLIP.
- (H) Heliport Selected
- (U) Unverified
- Abandoned - paved having landmark value, 3000 ft. or greater
- (F) Ultralight Flight Park Selected

Services-fuel available and field tended during normal working hours depicted by use of tiles and basic airport symbol. (Normal working hours are Mon thru Fri 1200 A.M. to 4:00 P.M. local time.) Consult A/FD for service availability at airports with hard-surfaced runways greater than 8069 ft.

☆ Rotating airport beacon in operation Sunset to Sunrise.

AIRPORT DATA

Box indicates F.A.R. 93 Special Air Traffic Rules & Airport Traffic Patterns. FSS — F.A.R. 91 — NO SVFR — Location Identifier — (R) NAME (NAM) — Airport Surveillance Radar — CT -118.3 * (B) ATIS 123.8 — Runways with Right Traffic Patterns (public use) — 285 L 72 122.95 — RP 25,34 — UNICOM — RP * (See Airport/Facility Directory) — VFR Advsy 125.0 — Airport of Entry

FSS – Flight Service Station

NO SVFR – Fixed-wing special VFR flight is prohibited.

CT -118.3 - Control Tower (CT) - primary frequency

NFCT – Non-Federal Control Tower

★ Star indicates operation part-time. See tower frequencies tabulation for hours of operation.

(B) - Indicates Common Traffic Advisory Frequencies (CTAF)

ATIS 123.8 - Automatic Terminal Information Service

ASOS/ AWOS 135.42 - Automated Surface Weather Observing Systems. Some ASOS/AWOS facilities may not be located at airports.

UNICOM – Aeronautical advisory station

VFR Advsy – VFR Advisory Service shown where ATIS not available and frequency is other than primary CT frequency.

285 Elevation in feet

L - Lighting in operation Sunset to Sunrise

*L - Lighting limitations exist, refer to Airport/Facility Directory.

72 - Length of longest runway in hundreds of feet; usable length may be less.

When facility or information is lacking, the respective character is replaced by a dash. All lighting codes refer to runway lights. Lighted runway may not be the longest or lighted full length(s). All times are local.

AIRPORT TRAFFIC SERVICE AND AIRSPACE INFORMATION

Only the controlled and reserved airspace effective below 18,000 ft. MSL are shown on this chart. All times are local.

- Class B Airspace
- Class C Airspace (Mode C See F.A.R. 91.215/AIM.)
- Class D Airspace
- (40) Ceiling of Class D Airspace in hundreds of feet. (A minus ceiling value indicates surface up to but not including that value.)
- Class E (sfc) Airspace
- Class E Airspace with floor 700 ft. above surface.
- Class E Airspace with floor 1200 ft. or greater above surface that abuts Class G Airspace.
- 2400 MSL / 4500 MSL Differentiates floors of Class E Airspace greater than 700 ft. above surface

Class E Airspace exists at 1,200' AGL unless otherwise designated as shown above.

Class E Airspace low altitude Federal Airways are indicated by center line.

Intersection - Arrows are directed towards facilities which establish intersection.

132° → V 69 — 169 — Total mileage between NAVAIDs on direct Airways.

- Prohibited, Restricted, Warning and Alert Areas
- Canadian Advisory and Restricted Areas
- MOA - Military Operations Area
- Special Airport Traffic Areas (See F.A.R. Part 93 for details)

- MODE C (See F.A.R. 91.215/AIM.)
- National Security Area
- Terminal Radar Service Area (TRSA)
- IR214 MTR - Military Training Routes

OBSTRUCTIONS

1000 ft. and higher AGL / below 1000 ft. AGL

or Group Obstruction

Obstruction with high-intensity lights May operate part-time

2049 (1149) UC — Elevation of the top above mean sea level / Height above ground / Under construction or reported; position and elevation unverified

NOTICE: Guy wires may extend outward from structures.

MISCELLANEOUS

-1° E — Isogonic Line (1995 VALUE)

- (U) Ultralight Activity
- Fl ☆ Flashing Light
- (H) Heng Glider Activity
- Marine Light
- (G) Glider Operations
- Parachute Jumping Area (See Airport/ Facility Directory.)
- NAME (Magenta, Blue, or Black) Visual Check Point

TOPOGRAPHIC INFORMATION

- Roads
- 15 30 Road Markers
- Railroad
- Bridges And Viaducts
- Power Transmission Lines
- Aerial Cable
- Landmark Feature - stadium, factory, school, golf course, etc.
- Outdoor Theatre
- Lookout Tower P-17 (Site Number) 618 (Elevation Base of Tower)
- CG Coast Guard Station
- Race Track
- Tank - water, oil or gas
- Oil Well • Water Well
- Mines And Quarries
- Mountain Pass
- 11823 (Elevation of Pass)

(Pass symbol does not indicate a recommended route or direction of flight and pass elevation does not indicate a recommended clearance altitude. Hazardous flight conditions may exist within and near mountain passes.)

Non-Perennial Lake, Rocks, Dams, Pier, Perennial Lake

RADIO AIDS TO NAVIGATION AND COMMUNICATION BOXES

- VHF OMNI RANGE (VOR)
- VORTAC
- VOR-DME
- Non-Directional Radiobeacon (NDB)
- NDB - DME
- Other facilities, i.e., Commercial Broadcast Stations, FSS Outlets-RCO, etc.

122.1R 122.6 123.6 — OAKDALE — 362*116.8 OAK — Underline indicates no voice on this frequency. ★ - Operates less than continuous or On-Request. T - TWEB H - HIWAS A - ASOS/ AWOS

122.1R — CHICAGO CHI — Heavy line box indicates Flight Service Station (FSS). Frequencies 121.5, 122.2, 243.0, and 255.4 (Canada - 121.5, 126.7 and 243.0) are normally available at all FSSs and are not shown above boxes. All other frequencies are shown. For Local Airport Advisory use FSS frequency 123.6. R - Receive only

122.1R — MIAMI — FSS providing voice communication

Frequencies above thin line box are remoted to NAVAID site. Other frequencies at FSS providing voice communication may be available as determined by altitude and terrain. Consult Airport/Facility Directory for complete information.

Not To Scale

Sources
NOAA Miami Sectional Aeronautical Chart, Scale 1:500,000, February 2006

Figure 2-2

Local Airspace Map

2.3 Flight Operational Procedures

Within the airspace controlled by NAS Key West procedures have been established, which must be adhered to by military pilots. Table 2-2 provides a summary of these flight procedures and course rules for approach, departure, and airport patterns associated with NAS Key West.

Table 2-2 Airport Flight Operational Procedures and Course Rules

Flight Operation	Operational Procedures
Straight-In Landing Practice/IFR	
Straight-In Landing Practice/VFR	Contact Approach Control/VFR Advisory Control at least 10 miles from airfield. Pattern altitude is 1000' unless specified otherwise by the control tower.
Field Carrier Landing Practice (FCLP)/Takeoff	
Field Carrier Landing Practice (FCLP)/Noise Abatement Path	Runway 03 is to be utilized to the maximum extent possible due to noise abatement. Runway 03 and 13 are designated as FCLP runways due to carrier deck lighting. Runway 07 is equipped with day use only FCLP markings.
Field Carrier Landing Practice (FCLP)/Pattern Altitude	Break altitude for all FCLP aircraft shall be 800', descending to pattern altitude of 600'. FCLP pattern altitude may be raised to 1000' by the Command Duty Officer in the event of continuous noise complaints.
Overhead Approaches:	Runway 25: Maintain 2500' until three DME Runway 07: Maintain 2000' until 2.6 DME Runway 03: Maintain 2500' until three DME Runway 13/21: Maintain 2500' until three DME Runway 31: Maintain 1500'
Traffic Patterns:	Left for all runways except Runway 03, which is right traffic. During FCLP operations to Runway 03, left traffic may be implemented.
Noise Abatement Path:	3000' over the City of Key West and the Keys

Source: NASKWINST 3710.2Q.

Notes: IFR= Instrument Flight Rules, VFR= Visual Flight Rules, FCLP= Field Carrier Landing Practice, DME= Distance Measuring Equipment.

This page intentionally left blank.

3.0 Aircraft Mix and Operations

The main sources of noise at Naval air installations are typically associated with aircraft operations, including flight operations and engine maintenance operations or run-ups. The level of noise exposure is related to a number of variables. The types of aircraft, number and time of aircraft operations, and flight tracks are the most significant variables.

This section discusses the past and present types of aircraft stationed at NAS Key West, the number of operations conducted by these aircraft, and the flight tracks used to conduct these operations. The existing condition for NAS Key West is defined around the historical airfield operations that happened in CY01. This data was collected from NAS Key West operations and NAS Air Traffic Control (ATC) staff and confirmed through detailed interviews and on-site review in September and December 2002. Detailed operational data was collected in response to a data call letter[1]. The data was reviewed at NAS Key West with ATC and Air Operations (AIROPS) personnel and the evolving Training Resource Strategy (TRS) was taken into account when the Navy reviewed and approved the data[2].

3.1 Aircraft Mix

3.1.1 Past Aircraft Types

Since the 1940s, aircraft squadrons have trained at NAS Key West. At the time of the 1977 AICUZ, NAS Key West was home base for nine squadrons of Reconnaissance Air Wing 1 who flew the RA-5C Vigilante, a supersonic heavy attack-reconnaissance aircraft. It was also the main ACM training base for East Coast F-4 Phantom fighter pilots in VF-101, ACM, Key West detachment. These two units had a total of 46 aircraft[3].

By 1992, the majority of operations were conducted by squadrons from other stations. Transient squadrons operated a variety of aircraft, including F/A-18s, F-4s, F-14s, and other jets. Aircraft from the VF-45 and VAQ-33 were also still based at the NAS Key West. VF-45 operated F-5s and served as an adversary squadron. VAQ-33 operated A-3s, A-6s, A-7s, and P-3s. In addition to operations performed by fixed-wing aircraft, operations were conducted by rotary-wing helicopters and general aviation aircraft from the Key West Navy Flying Club.

3.1.2 Present Aircraft Types

Today, NAS Key West serves transient flight units from around the country and has one squadron permanently based on board. Over 20 types of fixed wing and rotary wing aircraft typically deploy to NAS Key West for varying durations. Typical aircraft include F-5s, F-15s, F-16s, F/A-18s, T-45s, E-2/C-2s, and H-60s.

[1] CLF Data Call Letter 5090 SER N4654A/000419 of 08, October, 2002.
[2] CLF N4654A Email of 03, January, 1411 (local), 2003.
[3] Air Installations Compatible Use Zones Study, NAS Key West, 1977.

3.1.3 Future Aircraft Types

Future aircraft types training at NAS Key West in CY07 are projected to remain very similar to those of present with a few new aircraft coming on-line and a few aircraft being phased out. Table 3-2 provides a comparison of aircraft types deploying to NAS Key West for CY01 and CY07.

3.2 Aircraft Flight Operations

Derivation of flight operations was accomplished through the examination of Air Traffic Activity Reports (ATARs), obtained from ATC at NAS Key West[4]. Table 3-1 lists the reported overall annual operations for CY1990 through CY2006. Over the past 12 years, operations range from approximately 46,000 to 93,000 operations per year.

Table 3-1 Reported Annual Flight Operations Summary

Calendar Year (CY)	Military		Civil		
	Navy/Marine	Other Military	Air Carrier	General Aviation	Total
1990	89,966	24,334	27,400	35,975	**177,675**
1991	82,927	14,085	27,420	33,440	**157,872**
1992	78,246	22,093	28,899	35,315	**164,553**
1993	70,087	17,833	27,715	36,900	**152,535**
1994	53,855	12,637	508	2,306	**69,306**
1995	83,054	4,568	840	2,164	**90,626**
1996	40,484	2,814	1,417	2,282	**46,997**
1997	53,629	5,294	210	572	**59,705**
1998	41,198	4,518	36	334	**46,086**
1999	49,569	6,052	77	188	**55,886**
2000	47,485	3,873	50	145	**51,553**
2001	55,123	5,675	39	87	**60,924**
2002	48,511	9,416	44	131	**58,102**
2003	66,281	6,628	7,198	8,998	**89,105**
2004	34,688	4,983	3,574	5,604	**48,849**
2005	36,765	9,842	950	6,020	**53,577**
2006	44,322	8,802	18,700	21,072	**92,896**

Source: Aircraft Traffic Activity Reports NAS Key West.

[4] NAS Key West airfield visit conducted by Onyx & Wyle Laboratories with ATC and AIROPS personnel, September, 2002 & December 2002. Contained in two Aircraft Noise Studies for NAS Key West Florida by Wyle Laboratories, one for CY01 and one for CY07.

3.2.1 CY01 and CY07 Modeled Aircraft Flight Operations

Aircraft flight operations by aircraft type and time of day that were modeled to generate noise contours in the noise study for NAS Key West[5]. The operations are presented in Table 3-2. Though the overall total number of operations modeled are similar for CY01 and CY07, the subtotals by types of aircraft and times of flight are different. F/A-18C/D aircraft account for over one-third of the operations, or the most operation by aircraft type in CY01. In CY07, the number of F/A-18E/F operations increase. In total, F/A-18C/D and E/F aircraft operations increase 15 percent for CY07. Other changes include an increase in E-2/C-2, and training aircraft operations between CY01 and CY07. Overall, the F/A-18C/D and E/F aircraft are the dominant aircraft in terms of the number of operations and noise impact for both CY01 and CY07.

[5] Aircraft Noise Study for NAS Key West Florida, Wyle Laboratories, 2003.

Table 3-2 Comparison of Reported/Modeled CY01 and CY07 Aircraft Flight Operations

Aircraft	2001*				2007**		
	0700-2200	2200-0700	Total		0700-2200	2200-0700	Total
USMC F/A-18C/D					1,000	0	1,000
F/A-18C/D (CNAL)					6,662	335	6,997
F/A-18C/D (CCG4)					86	6	92
F/A-18A/B (CNARF)					6,061	0	6,061
F/A-18 C/D Totals	**22,262**	**0**	**22,262**		**13,809**	**341**	**14,150**
F/A-18E/F (CNAL)					10,925	887	11,812
F/A-18 E/F (COMNAVAIRPAC)					3,830	311	4,141
F/A-18 E/F Totals	**3,912**	**0**	**3,912**		**14,755**	**1,198**	**15,953**
F-16C/D (ANG)					960	0	960
F-16C/D (AFRC)					100	0	100
F-16C/D Totals	**1,269**	**0**	**1,269**		**1,060**	**0**	**1,060**
F-15A (ANG)	**1,845**	**0**	**1,845**		**960**		**960**
F-14	**12,648**	**0**	**12,648**		**0**	**0**	**0**
F-5 E/F (CNARF)	**924**	**0**	**924**		**486**	**0**	**486**
A-10	**76**	**0**	**76**		**0**	**0**	**0**
USMC AV-8B	**36**	**0**	**36**		**600**	**0**	**600**
A-4 (CCG4)					40	4	44
A-4 (CNAL)					3,425	20	3,445
A-4 Total	**474**	**0**	**474**		**3,465**	**24**	**3,489**
USMC EA-6B	**132**		**132**		**200**	**0**	**200**
E-2C (CNAL)					10,362	2,240	12,602
E-2C (CCG4)					16	2	18
E-2C (CNARF)					348	0	348
E-2/C-2 Total	**7,422**	**2,575**	**9,997**		**10,726**	**2,242**	**12,968**
C-141	**98**	**1**	**99**				***
C-130	**1,120**	**0**	**1,120**				***
C-17	**82**	**0**	**82**				***
C-12	**1,214**	**30**	**1,244**				***
C-9	**899**	**2**	**901**				***
C-5	**47**	**2**	**49**				***
KC-10 (CCG4)	**24**	**1**	**25**		**3**	**0**	**3**
P-3	**804**	**0**	**804**				***
S-3	**178**	**0**	**178**		**0**		**0**
T-45A (TRAWING TWO)	**916**	**0**	**916**		**750**		**750**
T-45C (TRAWING ONE)	**0**	**0**	**0**		**1,800**		**1,800**
T-39 (TRAWING SIX)	**231**	**0**	**231**		**264**		**264**
T-38	**44**	**0**	**44**		**0**		**0**
T-34 (TRAWING SIX)	**537**	**0**	**537**		**2,448**	**0**	**2,448**
T-2 (TRAWING ONE)	**401**	**0**	**401**		**0**		**0**
T-1 (TRAWING SIX)					**24**	**0**	**24**
Boeing 707 (CCG4)					**6**	**3**	**9**
KC-135 (CCG4)					**6**	**3**	**9**
G-1 (Gulfstream) (CCG4)					**5**	**3**	**8**
Learjet (CCG4)					**40**	**4**	**44**
H-3	238	0	238				***
SH-60	154	24	178				***
SH-65	154	24	178				***
Helicopters Total	**546**	**48**	**594**		**710**	**62**	**772**
Transient Transport Aircraft					**5,360**	**45**	**5,405**
TOTAL	**58,141**	**2,659**	**60,800**		**57,477**	**3,925**	**61,402**

Source: Aircraft Noise Study for NAS Key West Florida, Wyle Laboratories, 2003.
Notes: * 2001 Actual as reported by NAS Key West Air Traffic Control (ATC).
** 2007 Projected from various sources from October through December 2007 in reply to CLF ltr 5050 SER N4654A/000419 of 8 Oct 2002.
*** These aircraft were included as transient transports and rotary-wing aircraft for projection.
ANG= Air National Guard, AFRC= Air Force Reserve Command, CCG4= Commander Carrier Group Four, CNAL= Commander Naval Air Forces Atlantic, COMNAVAIRPAC= Commander Naval Air Forces Pacific, TRAWING= Training Wing.

A flight operation is any takeoff or landing at an airfield. The takeoff and landing may be part of a training maneuver (or pattern) associated with a departure or arrival of an aircraft to or from defense-related airspace. Several basic flight operations are described below:

- Departure. An aircraft taking off to a local training area, a non-local training area, or as part of a training maneuver.
- Straight-In Full-Stop Arrival. An aircraft lines up several miles from the field on the runway. The aircraft descends gradually, lands and comes to a full stop, then taxis off the runway. The non-overhead break is typically a straight-in full-stop arrival.
- Overhead-Break Arrival. An expeditious arrival using visual flight rules. An aircraft approaches the runway 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 a pattern, the aircraft lowers its landing gear and flaps and performs a 180-degree descending turn to land on the runway.
- Carrier-Break Arrival. Similar to an overhead break arrival using a shorter/carrier runway length. Approximately halfway down the runway, the aircraft performs a 180-degree turn to enter the landing pattern. Once established in a pattern, the aircraft lowers its landing gear and flaps and performs a 180-degree descending turn to land on the runway.
- Touch-and-Go (T&G). The 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. (For noise modeling purposes this is counted as one operation).
- Field Carrier Landing Practice (FCLP). An aircraft practices simulated aircraft carrier landings. FCLPs are required training for all pilots before landing on a carrier. The number of FCLPs performed are determined by the length of time that has elapsed since the pilot's last landing on a carrier. (For noise contour modeling purposes this is counted as one operation).
- Ground Controlled Approach (GCA) Box. A radar or "talk down" approach directed from the ground by ATC personnel. ATC personnel provide aviators with verbal course and glide slope information, allowing them to make an instrument landing during inclement weather.

3.2.2 CY01 Aircraft Flight Operations

CY01 aircraft flight information by aircraft type, operation type, and daytime and nighttime periods is presented Table 3-3. Twenty-eight aircraft types are listed in descending order of total flight operations. The operations types include departures, straight-in full-stop arrivals, overhead-break arrivals, carrier-break arrivals, T&G, FCLP, and GCA Box. A total of 2,659 operations, or 4 percent of grand total aircraft operations were conducted during the nighttime (2200-0700 local time) period with nearly 97 percent of the nighttime operations conducted by the E-2/C-2 turboprop aircraft. Table 3-3 shows the F/A-18C/D, F-14, and the E-2/C-2 aircraft being the top three contributors for CY01 in that order, with a combined total of 44,907 operations or approximately 74 percent of the grand total.

Table 3-3 CY01 Aircraft Flight Operations

Aircraft Type	Departures			"Straight-In" Full-Stop Arrival			Overhead Break Arrival (1500' AGL)			Carrier Break Arrival (800' AGL)		
	0700-2200	2200-0700	Total	0700-2200	2200-0700	Total	0700-2200	2200-0700	Total	0700-2200	2200-0700	Total
F/A-18C/D	9,564		9,564	138		138	8,483		8,483	2,701		2,701
F-14	5,493		5,493	170		170	4,727		4,727	1,150		1,150
E-2/C-2	2,176		2,176	227		227						
FA-18E/F	1,636		1,636	49		49	459		459	1,440		1,440
F-15	818		818	201		201	768		768			
F-16	1,141		1,141	14		14						
C-12	401		401	459	27	486						
C-130	397	3	400	487		487						
F-5	327		327	14		14	361		361			
T-45	221		221				235		235			
C-9	408	2	410	458		458	15		15			
P-3	158		158	52		52						
T-34	115		115	11		11	121		121			
A-4	164		164	17		17	171		171			
T-2	94		94	44		44	67		67			
H-3	119		119	119		119						
T-39	59		59	62		62	10		10			
S-3	25		25	2		2	27		27			
SH-60	77	12	89	77	12	89						
SH-65	77	12	89	77	12	89						
EA-6B	30		30				34		34			
C-141	38	1	39	48		48						
C-17	36		36	44		44						
A-10	21		21				23		23			
C-5	22		22	25	2	27						
T-38	21		21				23		23			
AV-8	11		11				13		13			
KC-10	11		11	13	1	14						
Total	**23,660**	**30**	**23,690**	**2,808**	**54**	**2,862**	**15,537**		**15,537**	**5,291**		**5,291**

(Continued Next Page)

Table 3-3 CY01 Aircraft Flight Operations (Continued)

Aircraft Type	Touch and Go*			FCLP* (600 Feet AGL)			GCA Box* (1,500 Feet AGL)			Grand Total		
	0700-2200	2200-0700	Total	0700-2200	2200-0700	Total	0700-2200	2200-0700	Total	0700-2200	2200-0700	Total
F/A-18C/D	1,078		1,078	298		298				**22,262**		**22,262**
F-14	932		932	176		176				**12,648**		**12,648**
E-2/C-2	632		632	4,387	2,575	6,952				**7,422**	**2,575**	**9,997**
FA-18E/F	328		328							**3,912**		**3,912**
F-15	58		58							**1,845**		**1,845**
F-16	78		78				36		36	**1,269**		**1,269**
C-12	232		232				122		122	**1,214**	**30**	**1,244**
C-130	236		236							**1,120**		**1,120**
F-5	222		222							**924**		**924**
T-45	250		250				210		210	**916**		**916**
C-9	18		18							**899**	**2**	**901**
P-3	248		248				346		346	**804**		**804**
T-34	156		156				134		134	**537**		**537**
A-4	122		122							**474**		**474**
T-2	98		98				98		98	**401**		**401**
H-3										**238**		**238**
T-39	68		68				32		32	**231**		**231**
S-3	124		124							**178**		**178**
SH-60										**154**	**24**	**178**
SH-65										**154**	**24**	**178**
EA-6B	68		68							**132**		**132**
C-141	12		12							**98**	**1**	**99**
C-17	2		2							**82**		**82**
A-10	32		32							**76**		**76**
C-5										**47**	**2**	**49**
T-38										**44**		**44**
AV-8	12		12							**36**		**36**
KC-10										**24**	**1**	**25**
Total	**5,006**		**5,006**	**4,861**	**2,575**	**7,436**	**978**		**978**	**58,141**	**2,659**	**60,800**

Source: Review of data conducted in cooperation with NAS Key West ATC. Contained in CY01 Aircraft Noise Study for NAS Key West Florida, Wyle Laboratories, 2002.
Notes: * Patterns counted as two operations. AGL Above Ground Level.

3.2.3 CY07 Modeled Aircraft Flight Operations

Aircraft flight operations information, as projected for CY07 for noise modeling, is presented in Table 3-4. Eighteen aircraft types are listed in descending order of total flight operations. The operations types include departures, straight-in full-stop arrivals, overhead-break arrivals, carrier-break arrivals, T&G, FCLP, and GCA Box. Approximately 3,925 operations, or 6 percent of grand total aircraft operations are expected to occur during the nighttime (2200-0700 local time) period with nearly 31 percent of those nighttime operations conducted by the F/A-18C/D and E/F aircraft and 57 percent by the E-2/C-2 turboprop aircraft. Table 3-4 shows the F/A18E/F, F/A-18C/D and the E-2/C-2 aircraft are projected to be the top three contributors to grand total operations, or approximately 70 percent of the grand total.

Table 3-4 CY07 Modeled Aircraft Flight Operations

Aircraft Type	Departures			"Straight-In" Full-Stop Arrival			Overhead Break Arrival (1500' AGL)			Carrier Break Arrival (800' AGL)		
	0700-2200	2200-0700	Total	0700-2200	2200-0700	Total	0700-2200	2200-0700	Total	0700-2200	2200-0700	Total
F/A-18E/F	6,396	343	6,739	498	129	627	3,469	200	3,669	2,429	14	2,443
F/A-18C/D	6,543	147	6,690	655	74	729	2,501	75	2,576	3,390		3,390
E-2/C-2	956		956	165	52	217	339		339	600		600
Transient Transport Aircraft	1,839	8	1,847	1,983	38	2,021	19		19			
A-4	1,620	2	1,622	2	2	4	1,518		1,518			
T-45C	720		720				150		150	570		570
T-34	1,224		1,224	424		424				800		800
F-16	470		470	170		170				300		300
F-15A	420		420	120		120				300		300
Helicopters	355	31	386	355	30	385						
AV-8B	300		300	50		50	100		100	150		150
F-5E/F	240		240	24		24	54		54	162		162
T-39	132		132	32		32				100		100
EA-6B	100		100	20		20	20		20	60		60
Learjet	20		20	20	4	24						
T-1	12		12	6		6				6		6
Boeing 707	6		6		3	3						
KC-135	6		6		3	3						
G-1	5		5		3	3						
KC-10	3		3									
Total	**21,367**	**531**	**21,898**	**4,524**	**338**	**4,862**	**8,170**	**275**	**8,445**	**8,867**	**14**	**8,881**

(Continued Next Page)

Table 3-4 CY07 Modeled Aircraft Flight Operations (Continued)

Aircraft Type	Touch and Go*			FCLP* (600 Feet AGL)			GCA Box* (1,500 Feet AGL)			Grand Total		
	0700-2200	2200-0700	Total	0700-2200	2200-0700	Total	0700-2200	2200-0700	Total	0700-2200	2200-0700	Total
F/A-18E/F		1,108	801	483	1284	54	29	83				**15,953**
F/A-18C/D		406	218	44	262	96		96				**14,149**
E-2/C-2		206	8380	2160	10540	80	30	110				**12,968**
Transient Transport Aircraft		935				585		585				**5,407**
A-4		200				125	20	145				**3,489**
T-45C		700	400		400	10		10				**2,550**
T-34												**2,448**
F-16						120		120				**1,060**
F-15A						120		120				**960**
Helicopters												**771**
AV-8B												**600**
F-5E/F						6		6				**486**
T-39												**264**
EA-6B												**200**
Learjet												**44**
T-1												**24**
Boeing 707												**9**
KC-135												**9**
G-1												**8**
KC-10												**3**
Total	**0**	**3,555**	**9,799**	**2,687**	**12486**	**1,196**	**79**	**1,275**	**0**	**0**	**0**	**61,402**

Source: Review of ATAR reports conducted by Wyle Laboratories in cooperation with NAS Key West ATC. Contained in CY 07 Aircraft Noise Study for NAS Key West Florida, Wyle Laboratories, 2003.
Notes: * Patterns counted as two operations. AGL Above Ground Level.

3.3 Runway and Flight Track Utilization

At NAS Key West, Runway 07 is the most active runway and is used 49 percent of the time. The second most active runway is Runway 13 that is used 32 percent of the time. Table 3-5 provides utilization percentages for the remaining runways and compares them with utilization percentages contained in the 1977 AICUZ[6].

Table 3-5 Comparison of Runway Utilization

Runway Number	1977 Annual Utilization (1)	CY01 and CY07 Utilization (2)
03	20%	11%
07	55%	49%
13	20%	32%
21	2%	1%
25	2%	5%
31	1%	2%
Total	**100%**	**100%**

Sources: (1) NAS Key West AICUZ, 1977 and (2) Aircraft Noise Study for NAS Key West Florida, Wyle Laboratories, 2003.

Table 3-6 presents modeled CY07 Average Annual Day Aircraft Operations at NAS Key West as used to develop noise contours and APZs that ultimately form the AICUZ footprint. The table was derived by multiplying the annual operations by the runway and track utilization percentages, and dividing the result by 365 days. This allows for the computation of the Average Annual Daytime and Nighttime events by flight track for each of the two aircraft types, rounded to the nearest 0.01 event. NOISEMAP, the suite of programs used to generate noise contours, uses Average Annual Day events per flight track to compute the noise exposure around airfields. An event is defined as a takeoff operation, a landing operation or a combination of both when the aircraft remains in the vicinity of the airfield. In order to input operations into NOISEMAP correctly, closed patterns (i.e., T&G, FCLP, GCA) which were counted as two operations (a takeoff and a landing) by ATC personnel, were divided by a factor of two to represent an average number of daily events on a closed pattern. A total of 168 Average Annual Day flight events were modeled for CY07 conditions at NAS Key West[7].

The flight tracks listed in Table 3-6 are illustrated in Figures 3-1 through 3-6[8]. These flight tracks represent "typical" operations[9]. Figure 3-1 shows the departure flight tracks. Figure 3-2 depicts straight-in arrival flight tracks. Figure 3-3 shows the over-head break and carrier-break arrival flight tracks. The abeam distance (the distance from aircraft to runway when aircraft is parallel with runway and flying in the opposite direction of runway heading) for all overhead flight tracks is 8,000 feet (1.3 nm). Figure 3-4 shows T&G flight tracks. The FCLP flight tracks of Figure 3-5 are illustrated in sets of three track per runway with varying upwind and crosswind leg lengths. The abeam distance on same-runway FCLP

[6] Air Installations Compatible Use Zones Study, NAS Key West, 1977.
[7] Aircraft Noise Study for NAS Key West Florida by Wyle Laboratories, 2003.
[8] Flight tracks verified during NAS Key West airfield visit conducted by Onyx and Wyle Laboratories with ATC and AIROPS personnel, Sept. & Dec., 2002 and arrival flight tracks to Runway 07 were updated in 2006 to reflect NAS Key West operational alternative in this update.
[9] The flight tracks depicted represent predominant flight paths of aircraft. Noise modeling is based on the use of predominant flight paths because these paths dominate the noise environment around an airfield. Flight paths are represented as single lines on maps, but actual flight paths may vary because of aircraft performance, pilot technique, and weather conditions. Therefore, an actual flight path (track) is better thought of as a band rather than a single line. Additionally, aircraft operate in accordance with FAA Visual Flight Rules (VFR). Such rules require aircraft to maintain certain altitude restrictions, but do not require pilots to adhere to specific flight tracks. NAS Key West has published recommended procedures for noise abatement (discussed further in Section 4.3). Pilots are aware of these procedures and adhere to them as best they can, given existing atmospheric conditions and aircraft safety.

tracks is 8,000 feet. Figure 3-6 contains the GCA Box pattern flight tracks. The GCA tracks are 4-5 nm wide and extend over a downwind distance of 8-10 nm.

Table 3-6 Modeled CY07 Average Annual Day Aircraft Operations

Operation Type	Runway	Flight Track	C-9A		F-16		F-15E	
			0700-2200	2200-0700	0700-2200	2200-0700	0700-2200	2200-0700
Departure	03	03D1	0.03		0.01		0.01	
		03D2	0.45		0.11		0.10	
		03D3	0.08		0.02		0.02	
	07	07D1	0.12		0.03		0.03	
		07D2	1.99	0.01	0.50		0.45	
		07D3	0.37		0.09		0.08	
	13	13D1	1.63	0.01	0.41		0.37	
	21	21D1	0.05		0.01		0.01	
	25	25D1	0.13		0.03		0.03	
		25D2	0.13		0.03		0.03	
	31	31D1	0.10		0.03		0.02	
Straight-In Arrivals	03	03A1	0.60	0.02	0.05		0.04	
	07	07A1	3.75	0.08	0.32		0.23	
	13	13A1	0.33	0.01	0.03		0.02	
	21	21A1	0.16		0.01		0.01	
	25	25A1	0.43		0.04		0.03	
	31	31A1	0.16		0.01		0.01	
Overhead Break (1500')	03	03O1	0.01					
	07	07O1	0.03		0.82		0.82	
	13	13O1	0.02					
	21	21O1						
	25	25O1						
	31	31O1						
Carrier Break (800')	03	03O1						
	07	07O1						
	13	13O1						
	21	21O1						
	25	25O1						
	31	31O1						
Touch & Go	03	03T2	0.14					
	07	07T2	0.63					
	13	13T2	0.41					
	21	21T2	0.01					
	25	25T2	0.06					
	31	31T2	0.03					
FCLP	03	03F1						
		03F2						
		03F3						
	07	07F1						
		07F2						
		07F3						
	13	13F1						
		13F2						
		13F3						
GCA Box Pattern	03	03G1	0.60		0.12		0.12	
	07	07G1						
	13	13G1	0.06		0.01		0.01	
	21	21G1	0.02					
	25	25G1	0.08		0.02		0.02	
	31	31G1	0.04		0.01		0.01	
Grand Total- Patterns Counted as 1			**12.64**	**0.14**	**2.74**		**2.47**	
Grand Total- Patterns Counted as 2			**14.73**	**0.14**	**2.90**		**2.63**	

(Continued Next Page)

Table 3-6 Modeled CY07 Average Annual Day Aircraft Operations (Continued)

Operation Type	Runway	Flight Track	A-4C		F/A-18 CD		F/A-18 E/F	
			0700-2200	2200-0700	0700-2200	2200-0700	0700-2200	2200-0700
Departure	03	03D1	0.04		0.10		0.10	0.01
		03D2	0.70		1.58	004	1.54	0.08
		03D3	0.13		0.30	0.01	0.29	0.02
	07	07D1	0.20		0.44	0.01	0.43	0.02
		07D2	3.12	0.01	7.03	0.16	6.87	0.37
		07D3	0.59		1.32	0.03	1.29	0.07
	13	13D1	2.55		5.74	0.13	5.61	0.30
	21	21D1	0.08		0.18		0.18	0.01
	25	25D1	0.20		0.45	0.01	0.44	0.02
		25D2	0.20		0.45	0.01	0.44	0.02
	31	31D1	0.16		0.36	0.01	0.35	0.02
Straight-In Arrivals	03	03A1	0.04		0.20	0.03	0.15	0.05
	07	07A1	0.25	0.02	1.24	0.15	0.94	0.25
	13	13A1	0.02		0.11	0.02	0.08	0.03
	21	21A1	0.01		0.05		0.04	
	25	25A1	0.03		0.14	0.01	0.11	0.01
	31	31A1	0.01		0.05	0.01	0.04	0.01
Overhead Break (1500')	03	03O1	0.54		0.75	0.03	1.05	0.36
	07	07O1	2.40		3.36	0.15	4.66	
	13	13O1	1.57		2.19	0.02	3.04	0.19
	21	21O1	0.05		0.07		0.10	
	25	25O1	0.24		0.34	0.01	0.48	
	31	31O1	0.10		0.14	0.01	0.19	
Carrier Break (800')	03	03O1				0.13		0.02
	07	07O1	2.43		9.29		6.65	
	13	13O1				0.07		0.01
	21	21O1						
	25	25O1						
	31	31O1						
Touch & Go	03	03T2	0.14		0.06		0.17	
	07	07T2	0.60		0.27		0.74	
	13	13T2	0.39		0.18		0.49	
	21	21T2	0.01		0.01		0.02	
	25	25T2	0.06		0.03		0.08	
	31	31T2	0.02		0.01		0.03	
FCLP	03	03F1	0.08		0.05	0.01	0.17	0.10
		03F2	0.08		0.04	0.01	0.16	0.10
		03F3	0.08		0.04	0.01	0.16	0.10
	07	07F1	0.02		0.01		0.04	0.02
		07F2	0.02		0.01		0.04	0.02
		07F3	0.02		0.01		0.04	0.02
	13	13F1	0.08		0.04	0.01	0.16	0.10
		13F2	0.08		0.05	0.01	0.17	0.10
		13F3	0.08		0.04	0.01	0.16	0.10
GCA Box Pattern	03	03G1	0.14	0.02	0.10		0.06	0.04
	07	07G1						
	13	13G1	0.01		0.01		0.01	
	21	21G1	0.01					
	25	25G1	0.02		0.01		0.01	
	31	31G1	0.01		0.01			
Grand Total- Patterns Counted as 1			**17.62**	**0.06**	**36.85**	**0.87**	**37.74**	**2.58**
Grand Total- Patterns Counted as 2			**19.58**	**0.08**	**37.83**	**0.93**	**40.42**	**3.28**

(Concluded Next Page)

Table 3-6 Modeled CY07 Average Annual Day Aircraft Operations (Concluded)

Operation Type	Runway	Flight Track	E-2/C-2		F-5E		Helicopters		Total		
			0700-2200	2200-0700	0700-2200	2200-0700	0700-2200	2200-0700	2200-0700	2200-0700	Total
Departure	03	03D1	0.03						0.32	0.01	0.32
		03D2	0.53		0.06				5.07	0.12	5.19
		03D3	0.10		0.01				0.95	0.02	0.97
	07	07D1	0.15		0.02				1.41	0.03	1.44
		07D2	2.34		0.26		0.24	0.02	22.81	0.56	23.37
		07D3	0.44		0.05				4.23	0.10	4.33
	13	13D1	1.91		0.21		0.24	0.02	18.66	0.46	19.12
	21	21D1	0.06		0.01				0.58	0.01	0.59
	25	25D1	0.15		0.02		0.24	0.02	1.68	0.06	1.74
		25D2	0.15		0.02		0.24	0.02	1.68	0.06	1.74
	31	31D1	0.12		0.01				1.15	0.03	1.18
Straight-In Arrivals	03	03A1	0.18	0.02	0.01		0.24	0.02	1.50	0.14	1.64
	07	07A1	1.11	0.10	0.05				7.88	0.60	8.48
	13	13A1	0.10	0.01			0.24	0.02	0.93	0.09	1.01
	21	21A1	0.05				0.24	0.02	0.59	0.03	0.61
	25	25A1	0.13	0.01	0.01				0.91	0.03	0.95
	31	31A1	0.05				0.24	0.02	0.59	0.05	0.63
Overhead Break (1500')	03	03O1	0.10		0.02				2.46	0.49	2.95
	07	07O1	0.46		0.07				10.97		10.97
	13	13O1	0.30		0.05				7.16	0.26	7.43
	21	21O1	0.01						0.22		0.22
	25	25O1	0.05		0.01				1.12		1.12
	31	31O1	0.02						0.45		0.45
Carrier Break (800')	03	03O1	1.53						1.53	0.02	1.56
	07	07O1	0.77		0.44				21.22		21.22
	13	13O1	1.53						1.53	0.01	1.55
	21	21O1									
	25	25O1									
	31	31O1									
Touch & Go	03	03T2	0.03						0.54		0.54
	07	07T2	0.14						2.39		2.39
	13	13T2	0.09						1.56		1.56
	21	21T2							0.05		0.05
	25	25T2	0.01						0.24		0.24
	31	31T2	0.01						0.10		0.10
FCLP	03	03F1	1.76	0.45					2.05	0.56	2.62
		03F2	1.70	0.44					1.99	0.55	2.54
		03F3	1.70	0.44					1.99	0.55	2.54
	07	07F1	0.39	0.10					0.46	0.13	0.58
		07F2	0.38	0.10					0.44	0.12	0.56
		07F3	0.38	0.10					0.44	0.12	0.56
	13	13F1	1.70	0.45					1.99	0.56	2.55
		13F2	1.76	0.44					2.05	0.55	2.60
		13F3	1.70	0.44					1.99	0.55	2.54
GCA Box Pattern	03	03G1	0.08	0.04	0.01				1.23	0.10	1.33
	07	07G1									
	13	13G1	0.01						0.11	0.01	0.12
	21	21G1							0.05		0.05
	25	25G1	0.01						0.16		0.16
	31	31G1	0.01						0.08		0.08
Grand Total- Patterns Counted as 1			**24.22**	**3.14**	**1.32**		**1.94**	**0.17**	**137.54**	**6.97**	**144.50**
Grand Total- Patterns Counted as 2			**36.09**	**6.14**	**1.33**		**1.94**	**0.17**	**157.47**	**10.75**	**168.22***

Source: Aircraft Noise Study for NAS Key West Florida, Wyle Laboratories, 2003.
Note: * 168.22 Average Annual Day Operations x **365** Days/Year = **61,400** Annual Operations for CY07.

This page intentionally left blank.

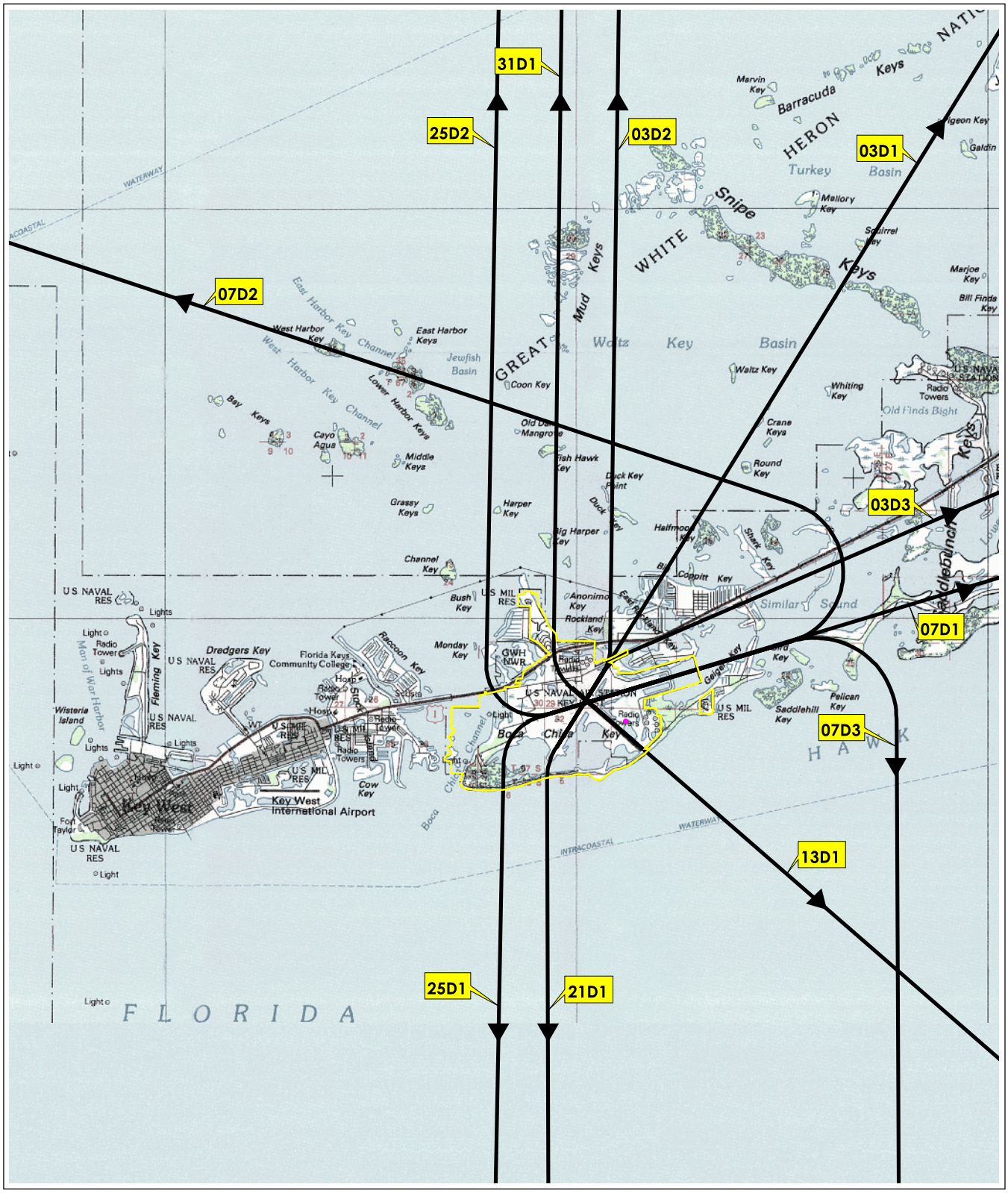


Figure 3-1 Departure Flight Tracks

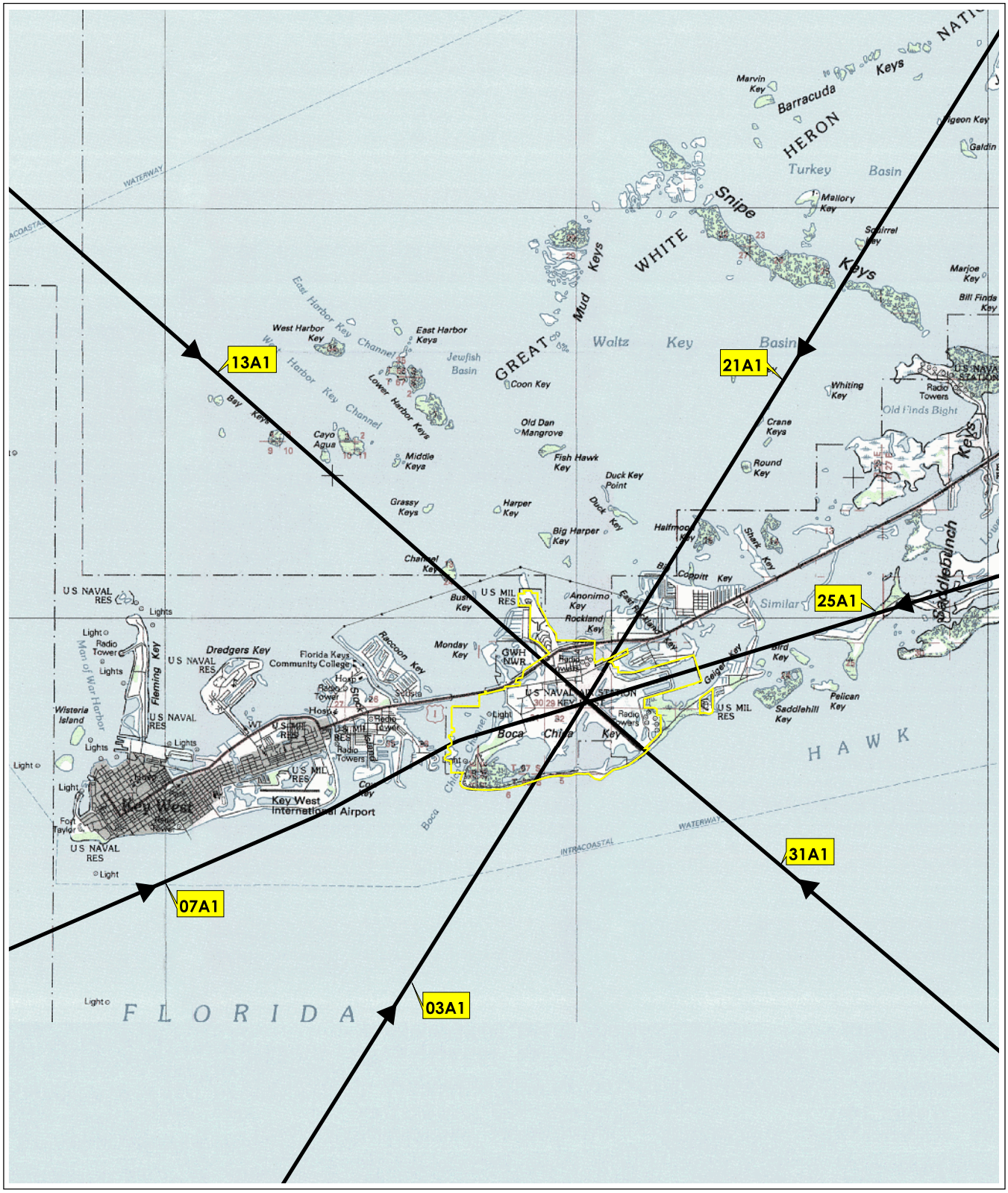
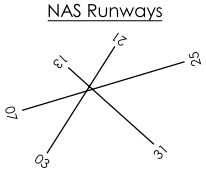


Figure 3-2 Straight-In Arrival Flight Tracks

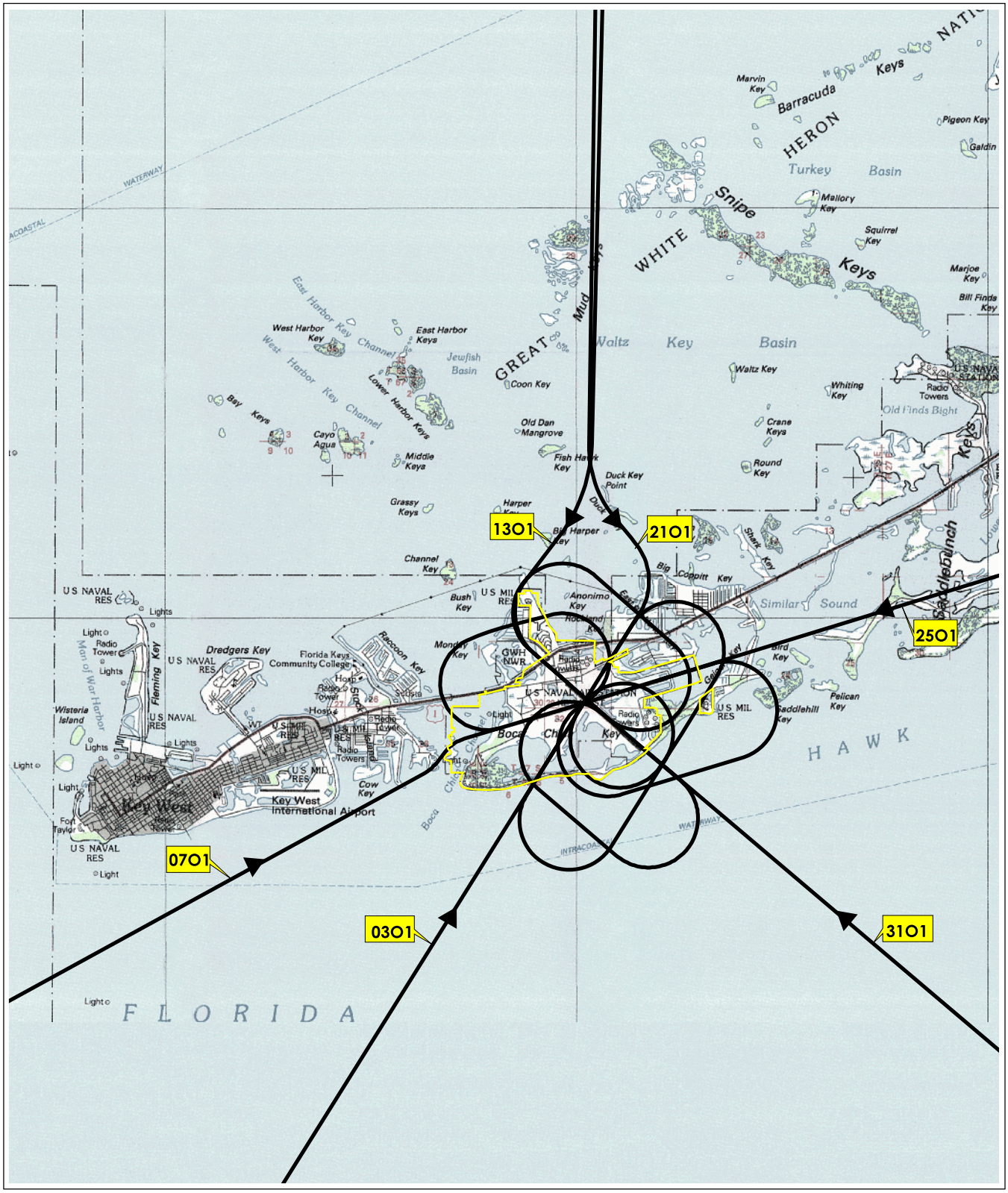
NAS Runways



Sources
USGS 1:100,000 DRG
Wyle Laboratories, 2003

N

0 5000 10000 Feet



NAS Runways

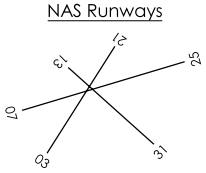


Figure 3-3 Overhead-Break and Carrier-Break Arrival Flight Tracks

Sources
USGS 1:100,000 DRG
Wyle Laboratories, 2003
Louis Berger, 2006

N

0 5000 10000 Feet

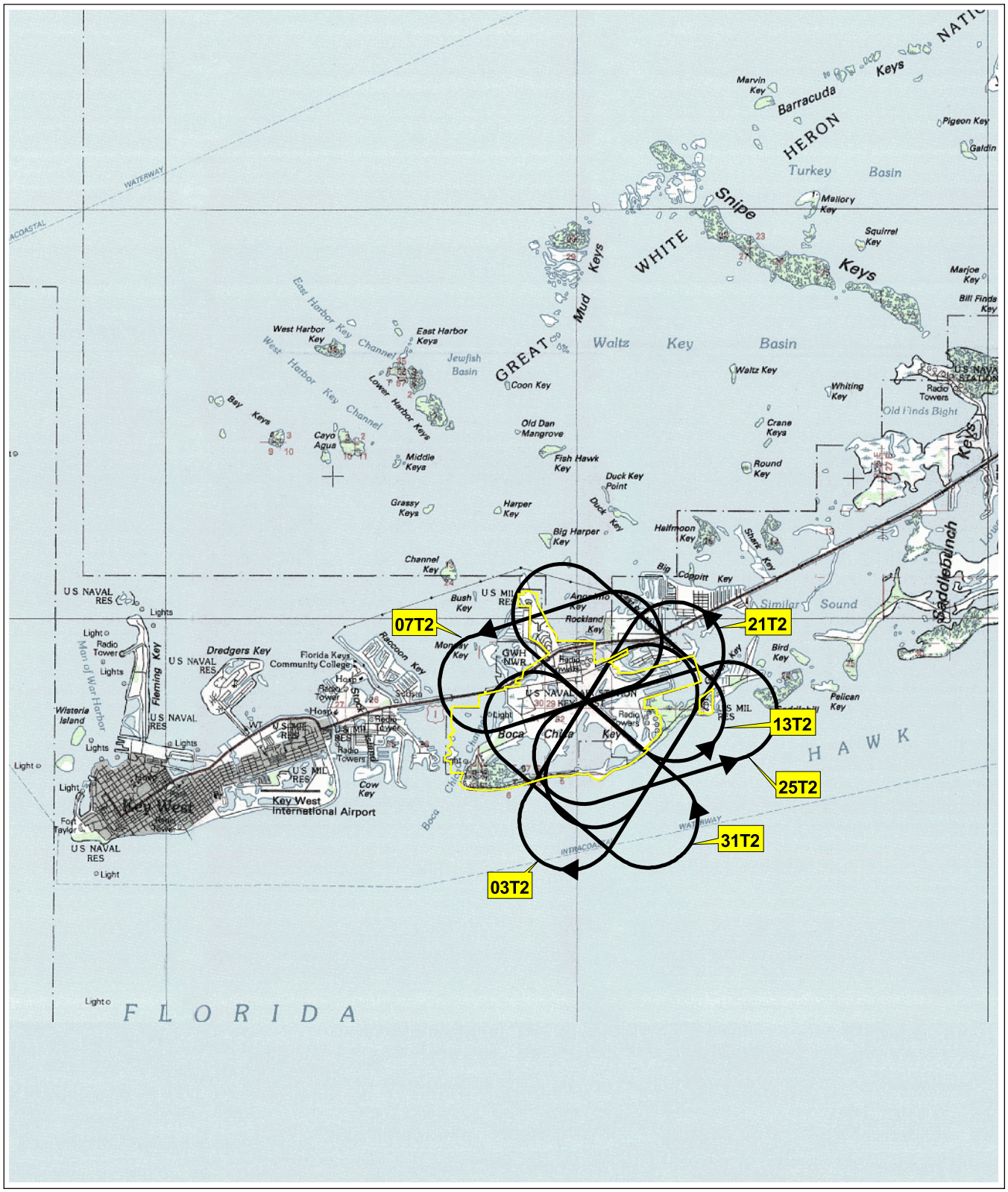
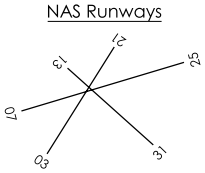


Figure 3-4 Touch and Go Flight Tracks

NAS Runways



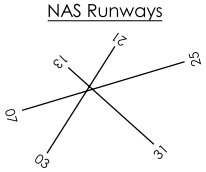
Sources
USGS 1:100,000 DRG
Wyle Laboratories, 2003

N

0 5000 10000 Feet

Figure 3-5 FCLP Flight Tracks

NAS Runways



Sources
USGS 1:100,000 DRG
Wyle Laboratories, 2003/2005

N

0 5000 10000 Feet

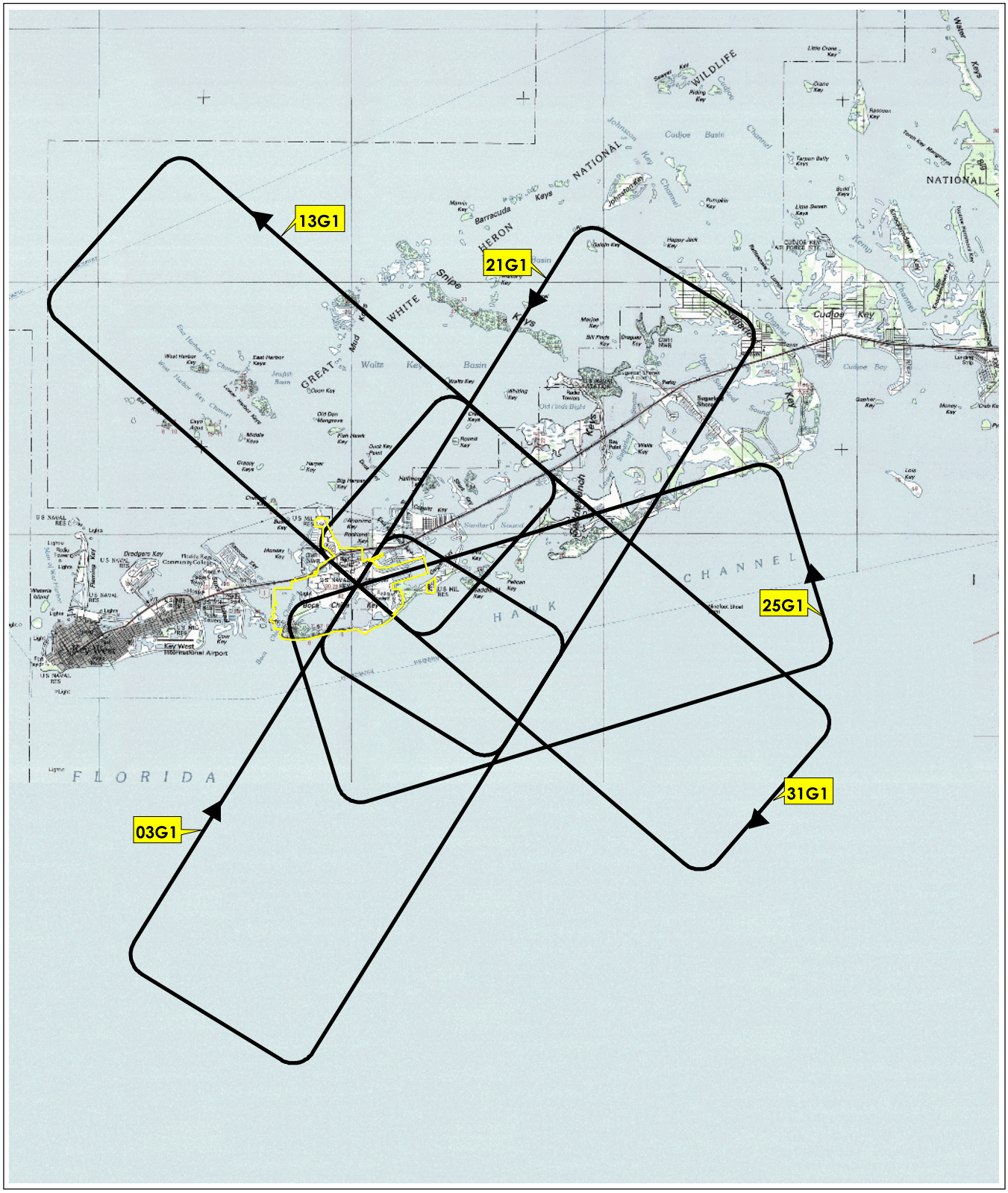
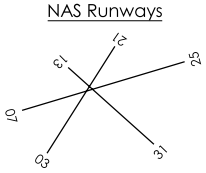


Figure 3-6 GCA Box Flight Tracks

NAS Runways



Sources
USGS 1:100,000 DRG
Wyle Laboratories, 2003

N

0 5000 10000 Feet

3.4 Modeled Pre-Flight and Maintenance Run-Up Operations

At NAS Key West, pre-flight run-up operations occur at the threshold of the takeoff runway prior to brake release. Table 3-7 lists the duration and power settings for the pre-flight run-ups of the representative aircraft types as modeled to develop noise contours.

Table 3-7 Pre-Flight Run-Ups

Representative Aircraft Type	Duration @ Power Setting
A-4	30 seconds @ 85%NC
F-15	Not currently required.
F-16	1 second @ 103% NC
F/A-18	Not currently required.
E-2C	30 seconds @ 4,000 ESHP
C-9	5 seconds @ 2.0 EPR

Source: Aircraft Noise Study for NAS Key West Florida, Wyle Laboratories, 2003.

Notes: Pre-flight run-ups occur at runway ends/heading prior to each departure. Durations are per engine.
NC compressor revolutions per minute, EPR engine pressure ratio, and ESHP effective shaft horsepower

Table 3-8 lists the modeled single-engine maintenance run-up events projected for CY07 as modeled to develop noise contours. Figure 1-2 illustrates the two in-frame outdoor run-up areas located near the ends of Runways 03 and 31.

Table 3-8 Modeled CY07 Single-Engine Maintenance Run-Up Events

Representative Aircraft Type	Location		Events				Reported Power Setting	Modeled Power Setting	Duration (minutes)
			Annual		Average Annual Day				
	Name	ID	0700-2200	2200-0700	0700-2200	2200-0700			
F/A-18C/D	In-frame Outdoor High-power Run-up Area	A	15		.04		100% NC	95% NC	45
	Line	B	50	50	0.14	0.14	80% NC	80% NC	30
F/A-18E/F	In-frame Outdoor High-power Run-up Area	A	42		0.12		100% NC	95% NC	30
	Line	B	193	128	0.53	0.35	80% NC	80% NC	30
EA-6B	In-frame Outdoor High-power Run-up Area	A	5		0.01		100% NC	99% NC	45
	Line	B	15	100	0.04	0.27	80% NC	80% NC	30
AV-8B	In-frame Outdoor High-power Run-up Area	A	15		0.04		100% NC	95% NC	45
	In Line	B	25	50	0.07	0.14	80% NC	80% NC	30

Source: Aircraft Noise Study for NAS Key West Florida, Wyle Laboratories, 2003.

Note: NC = compressor revolutions per minute.

This page intentionally left blank.

4.0 Noise

Aircraft noise is of concern to many communities surrounding airports. The impact of aircraft noise is also a factor in the planning of future land use near air facilities. Because the noise from these operations impacts surrounding land use, the Navy has defined certain areas as high noise zones under the AICUZ Program.

This section discusses noise associated with aircraft operations including flight operations, pre-flight and maintenance run-up operations, and the higher noise zones associated with these operations. This section then presents noise exposure from air operations at NAS Key West. The updated noise zones will later be combined with updated APZs to form the updated AICUZ footprint (see Section 5).

4.1 What is Noise?

Noise is unwanted sound. Sound is all around us; sound becomes noise when it interferes with normal activities such as sleep and conversation. Sound or noise levels are measured in A-weighted decibels (dBA), a unit of sound pressure adjusted to the range of human hearing, with an intensity greater than the ambient or background sound pressures. 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. Sound levels much above 140 dBA are felt as pain.

Noise exposure is measured using the day-night average sound level (DNL). The symbol Ldn is generally used as the descriptor for day-night average sound level in mathematical equations, although the descriptors Ldn and DNL are commonly used interchangeably. The descriptor DNL is used throughout this report for the day-night average sound level. The DNL noise metric averages noise events that occur over a 24-hour period. Aircraft operations conducted during "acoustic" night (10:00 p.m. to 7:00 a.m.) are weighted with a 10 decibel penalty because people are more sensitive to noise during normal sleeping hours, when ambient noise levels are lower. DNL has been determined to be a reliable measure of community sensitivity to aircraft noise and has become the standard metric used in the U.S. to quantify aircraft noise.

DNL is depicted as contours connecting points of equal value, usually in 5-decibel increments. Calculated noise contours do not represent exact scientific noise measurements. Noise levels inside a contour may be similar to those outside a contour line. The area between two specific sets of contours is known as a noise zone.

The average of noise over a 24-hour period does not ignore the louder single events. When noise levels of two or more sources are added, the source with the lower noise level is dominated by the source with the higher noise level. Thus, the combined noise level is usually only slightly higher than the noise level produced by the louder source.

Noise levels of the loudest aircraft operations significantly influence the 24-hour average. For example, if one daytime aircraft overflight measuring 100 dBA for 30 seconds occurs within a 24-hour period in a 50-dBA noise environment, the DNL will be 65.5. If 10 such 30-second aircraft overflights occur in daytime hours in the 24-hour period, the DNL will be 75.4. Therefore, a few maximum sound events occurring during a 24-hour period will have a strong influence on the 24-hour DNL even though lower sound levels between flights may account for the majority of the 24-hour duration.

For more information on noise, see Appendix D–Noise and its Effects on the Environment.

4.2 Aircraft Noise Sources

The main sources of noise at Naval air installations are aircraft operations, including flight operations and engine maintenance operations or run-ups as discussed throughout Section 3.0. Computer models are used to develop noise contours based on information about these operations including:

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

4.3 Noise Complaints and Noise Abatement Procedures

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 event
- General sensitivity to noise
- Time of day
- Length of time an individual is exposed to a noise
- Predictability of noise
- Average temperature

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

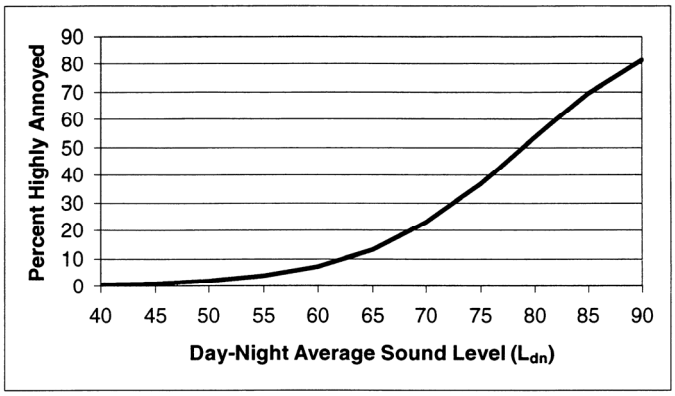
Table 4-1 Subjective Responses to Changes in dBA

Change	Change in Perceived Loudness
1 dB	Requires close attention to notice
3 dB	Barely perceptible
5 dB	Quite noticeable
10 dB	Dramatic, twice or half as loud
20 dB	Striking, fourfold change

Source: Aircraft Noise Study for NAS Key West Florida by Wyle Laboratories, 2003.

On a group or community level, various studies and surveys have shown a correlation between Ldn and the percentage of people who consider themselves "highly annoyed". This correlation is shown in Figure 4-1. This curve, which was originally developed in the 1970s and has been updated over the past ten years, remains the best available method to estimate community response to transportation noise, including aircraft noise.

Figure 4-1 Influence of Sound Levels on Annoyance



Source: Shultz, 1978

4.3.1 Noise Complaints

A noise complaint response and abatement program has been implemented at NAS Key West to log and track noise complaints, analyze complaint locations and times, and identify the flights/operations that generated the complaints. Table 4-2 provides the number of recent noise complaints on record at NAS Key West. Unlike most airfields that receive noise complaints in the summer, NAS Key West receives complaints in the winter months when residents turn off their air conditioners and open windows.

The following describes NAS Key West's response process when a noise complaint is made. Persons with noise complaints generated in the operational environs of NAS Key West can call the Public Affairs Office (PAO) (305) 293-2425 during normal business hours to place a complaint, or the Command Duty Officer (CDO) after normal business hours at (305) 293-2268. Personnel answering the call record pertinent information such as the location, time, and description of the noise generating event. After the noise complaint is logged, it is reviewed by the PAO and often passed through to AIROPS where it is again reviewed, the responsible squadron is identified, and any flight violations are identified. The PAO, or other assigned personnel may then call, or write, the individual who complained and provide an explanation as to what caused the noise.

Table 4-2 Noise Complaints for NAS Key West Operations

Year	Number of Complaints				
	January-March	April-June	July-September	October-December	Totals
2004	1	3	0	0	**4**
2005	16	2	0	0	**18**
2006	1	1	0	1	**3**

Source: NAS Key West Public Affairs Office, 2006.

4.3.2 Noise Abatement Procedures

NAS conducts noise abatement procedures commensurate with safety and operational training requirements.

- Aircraft do not normally fly over the Florida Keys below 3,000 feet, unless under radar control or executing an approved instrument approach. The Florida Keys are within the Florida Keys National Marine Sanctuary. Minimum altitude for military aircraft is normally 3,000 feet, unless the mission requires lower.
- Pilots of aircraft departing from or remaining in the Runway 07 traffic pattern use climb and flight paths that avoid flying over Key Haven, Big Coppitt, Tamarac Park or Geiger Key Marina.
- Supersonic flight operations conducted in accordance with OPNAVINST 3710.7 (General Naval Air Training & Operating Procedure & Standard [NATOPS]).
- Aircraft remain above 2,500 feet, while within a 3.9 statute mile radius of the center of Key West International Airport unless: under radar control, executing a published instrument approach, direct radio communications with Key West International Tower, or operating within the NAS Key West Class "D" Surface Area.

4.4 Day-Night Average Sound Levels

The noise environment around an air installation is typically described using a measure of cumulative noise exposure that results from all aircraft operations. As discussed previously, the DOD specified metric used to account for this noise is referred to as the Day-Night Average Sound Level, abbreviated as DNL and symbolized by Ldn. The following provides a more detailed description of the DNL:

- In general, DNL can be thought of as an accumulation of all of the noise produced by individual events that occur throughout a 24-hour period. The noise of each event is accounted for by a noise metric that integrates the changing sound level over time. These integrated sound levels for individual events are called Sound Exposure Levels (SELs). The logarithmic accumulation of the SELs from all operations during a 24-hour period determines the DNL for the day at that location.
- DNL also takes into account the time of day the noise events occur. The measure recognizes that events during the nighttime hours may be more intrusive, and therefore more annoying, than the same activity conducted during daytime hours, when background noise levels are higher. To account for this additional annoyance, a penalty of ten dB is added to each event that takes place during "acoustic" nighttime hours, defined as 2200 to 0700 the next day.
- Finally, DNL values around an air installation are presented not just for a single specific 24-hour period, but rather for an annual average day[1].

DNL averaging is done to obtain a stable representation of the noise environment free of variations in day to day operations or between weekdays and weekends as well as from fluctuations in wind directions, runway use, temperature, aircraft performance, and total airfield operations (any one of which can significantly influence noise exposure levels from one day to the next). The accumulation of noise computed in this manner provides a quantitative tool for comparing overall noise environments and developing compatible land use plans. The DNLs are represented as contours connecting points of equal value, usually in five dB increments from 55 up to 75 or 80 dB on the contour values.

[1] The average annual day takes the total number of operations per year and divides it by 365 days per year.

At a minimum, DOD requires that sound level contours be plotted for DNL values of 65, 70, 75 and 80 in AICUZ Studies. Three general noise exposure zones can then be defined: areas with a DNL of less than 65; areas with a DNL between 65 and 75; and areas with a DNL of 75 or greater. These three areas are defined as Noise Zones 1, 2 and 3, respectively.

4.5 Noise Contours

4.5.1 Methodology

The Navy periodically conducts noise studies to assess the noise impacts of aircraft operations. The need to conduct a noise study is generally prompted by a significant change in aircraft operations– either by the number of operations conducted at the airfield, the number of and type of aircraft using the airfield, or the flight paths used for airfield departure/arrival changes.

NOISEMAP (Version 7.0), a widely accepted DOD computer model, was used in this study to project noise impacts around military airfields. NOISEMAP calculates DNL contours resulting from aircraft operations using such variables as power settings, aircraft model and type, maximum sound levels and duration and flight profiles for a given airfield.

4.5.2 Noise Exposure

The flight paths, as well as pre-flight and maintenance run-ups, establish the shape of the noise contours. In general, approaches and departures cause the narrow tapering portions of the contours while T&G/FCLP operations determine the general contour size. Noise from pre-flight and maintenance run-ups locations, if not overshadowed by flight operations, cause circular arcs. The noise contours depicted reflect the operational alternative of shortening the final approach to Runway 07. These updated noise contours are shown in Figure 4-2 and 4-3[2].

For CY 07, the figure shows noise contours between 55-dB DNL and 85-dB DNL with intervals of 5-dB DNL. The 55-dB DNL contour extends some six statute miles to the north and about six miles to the east-northeast of the NAS Key West mid-field point, predominately over water. The 55-dB DNL contour also extends seven miles to the west/southwest of the mid-field point over the City of Key West and about 11 miles to the southwest over water. The shape of the 55-dB DNL contour projects out from NAS Key West at several points along flight tracks associated with arrivals and departures.

The 65-dB DNL contour for CY07 is an area where some land use controls are recommended. This contour extends approximately three miles to the north of NAS Key West over water and U.S. Route 1. The 65-db DNL contour also extends about five miles to the southwest and over portions of Cow Key, Stock Island, and a small portion of the City of Key West. The contour also extends to the shoreline of Raccoon Key and Key Haven. To the east, the 65-db DNL contour includes all of Geiger Key, East Rockland Key, and most of Big Coppitt Key.

The 75-dB DNL contour is the area recommended to have the most land use controls, and it extends off base impacting portions of Geiger Key and East Rockland Key to the east and a small portion of Stock Island to the west near Boca Chica Channel.

In the area of 55-dB DNL to 65-dB DNL, people can still be annoyed as can be seen in Figure 4-1.

[2] Aircraft Noise Study for CY01 NAF Key West, Wyle Laboratories, 2002 and Development of Revised Aircraft Noise Contours for NAF Key West, Florida, August 13, 2005.

4.6 Noise Contours at Key West International Airport

Figure 4-4 illustrates 2004 noise contours at Key West International Airport which is located three miles west of NAS Key West's Boca Chica Field[3]. The contours extend outward a few thousand feet from the airport's runway ends and are small relative to those produced by operations at NAS Key West. Land on the southeastern side of the City of Key West and on Stock Island and Cow Key is subject to the cumulative noise produced by operations at both Key West International Airport and NAS Key West.

[3] Key West International Airport Part 150 Study, 2006.

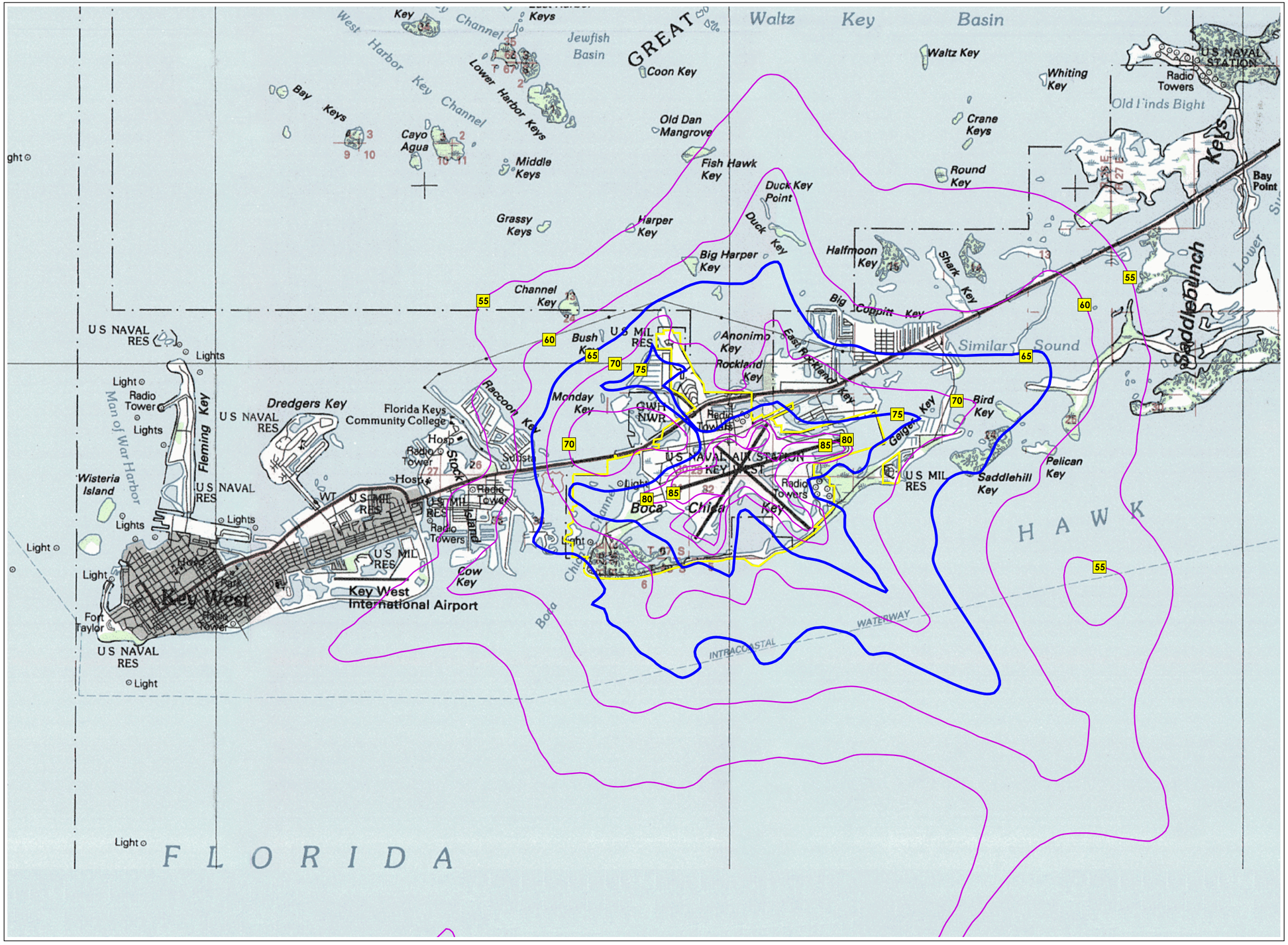
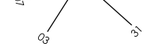


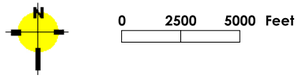
Figure 4-2
CY01 DNL Noise Contours

Legend
CY01 DNL Contours
65 and 75 Ldn
55, 60, 70, 80, and 85 Ldn

Airfield Boundary (Approximate)

NAS Runways





Sources
NAS Key West, 2003
Wyle Laboratories, 2003/2005
USGS 1:100,000 DRG

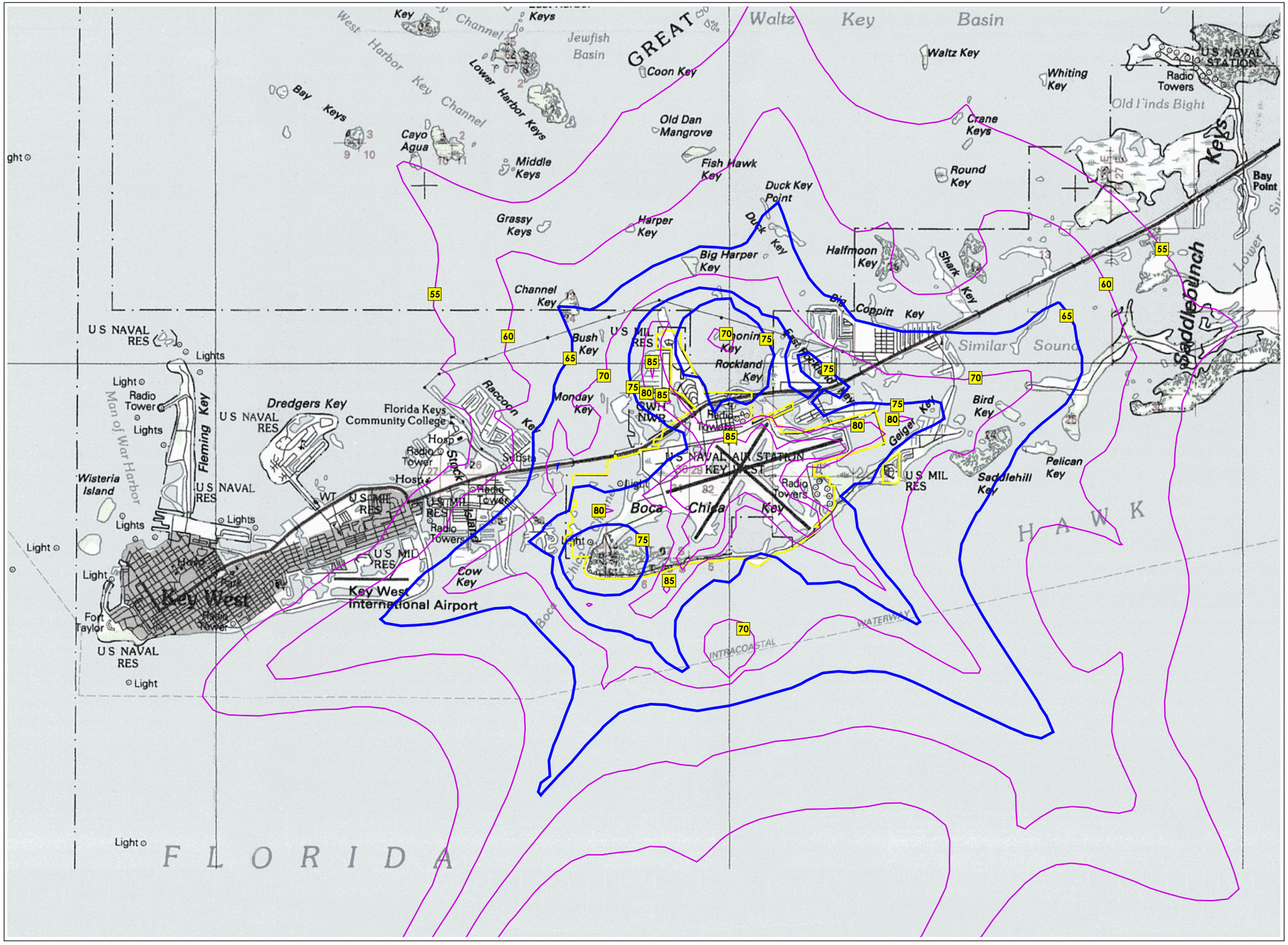


Figure 4-3

CY07 DNL Noise Contours

Legend

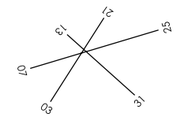
CY07 DNL Contours

65 and 75 Ldn

55, 60, 70, 80, and 85 Ldn

Airfield Boundary (Approximate)

NAS Runways



0 2500 5000 Feet

Sources

NAS Key West, 2003

Wyle Laboratories, 2003/2005

USGS 1:100,000 DRG

Figure 4-4

Key West International Airport 2004 DNL Noise Contours

Source
Part 150 Study - 2004 Noise Contour Update for Key West International Airport, 2006

5.0 Safety

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

One such safety issue centers on the fact that aircraft mishaps are more likely to occur near airfield runways than any other single area. The Navy has identified APZs around its runways based on historical data of where mishaps occur, when and if they occur, and the total number of flight operations taking place at specific runways. Although the likelihood of an accident is remote, the Navy recommends that certain land uses that concentrate large numbers of people, such as dense residential developments and schools, be avoided in the APZs.

In addition, the FAA and the military have defined flight safety zones 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 vicinity of the airfield include:

- Uses that attract birds, especially waterfowl
- Lighting (direct or reflected) that would impair pilot vision
- Uses that would generate smoke, steam, or dust
- Electromagnetic interference with aircraft communication, navigation, and electric systems

5.1 Imaginary Surfaces

Aircraft operations are constrained by the surrounding natural terrain and manmade features such as buildings, towers, poles, and other potential vertical obstructions to navigation. NAVFAC P-80.3; FAA Regulations, CFR, Title 14, Part 77; and the FAA Advisory Circular 150/5300-13 identify a complex series of imaginary surfaces or planes used for siting facilities and determining obstructions to air navigation for military airports.

Before the imaginary surfaces can be determined, the classes of runways the surfaces extend off of needs to be determined. DOD fixed-wing runways are separated into two classes for the purpose of defining imaginary surfaces and APZs- Class A and Class B runways. Class A runways are used primarily by light aircraft and do not have the potential for intensive use by heavy or high performance aircraft. Class B runways are all other fixed-wing runways. All runways at NAS Key West are designated as Class B runways.

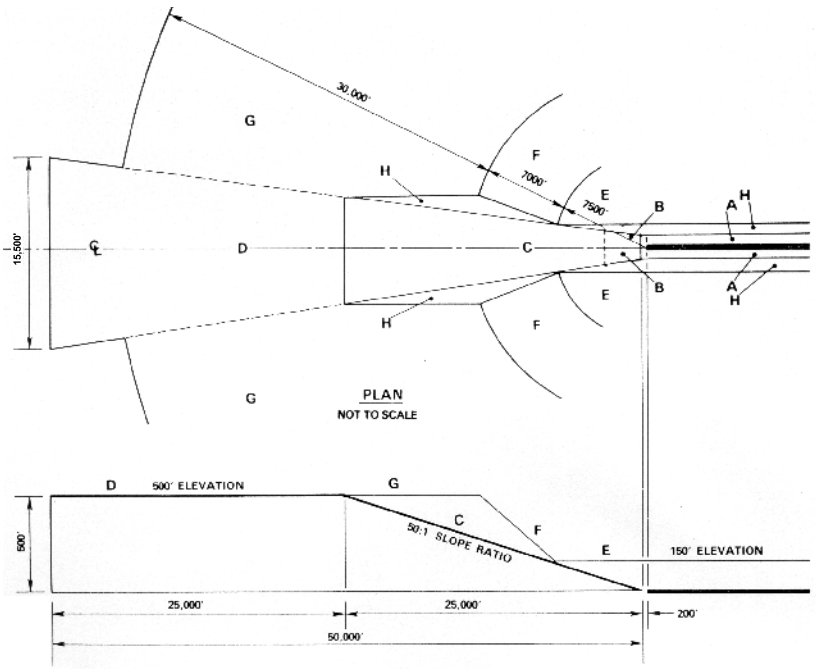
- NAS Key West has three Class B runways: 03/21, 07/25, and 13/31.

As per the P-80.3, for Class B runways, specific criteria are provided for the implementation of:

- 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 is 1,500 feet per Class B runway. The Primary Surface is normally highly protected and free of all obstructions.
- The *Clear Zone* is located immediately adjacent to the end of the runway and extends 3,000 feet outward along the runway centerline.
- *Approach-Departure Clearance Surfaces* extend from the primary surfaces at a 50:1 inclined plane for Class B runway. When the surface reaches an elevation of 500 feet, the surface becomes a horizontal plane.
- *Horizontal Clearance Surfaces* include one at 150 feet above airfield elevation extending to 7,500 feet from the runway, and another at 500 feet above airfield elevation extending from 14,500 feet to 44,500 feet from the runway end.
- *Conical and other Transitional Surfaces* connect the Horizontal Surfaces to the Approach/Departure Clearance Surfaces and the Primary Surfaces.

In general, no above ground structures are permitted in the primary surface and clear zone areas. The height of structures should be controlled to prevent penetration of the transitional surfaces and approach departure surfaces. These height restrictions limit the height of structures as the distance from the runway surface decreases. As one approaches the runway surface and its corresponding flight path, more stringent height limitations are imposed.

Figure 5-1 details the geometry used to create the imaginary surfaces for Class B runways. Figure 5-2 depicts and illustrates the geometry of the imaginary surfaces for NAS Key West.

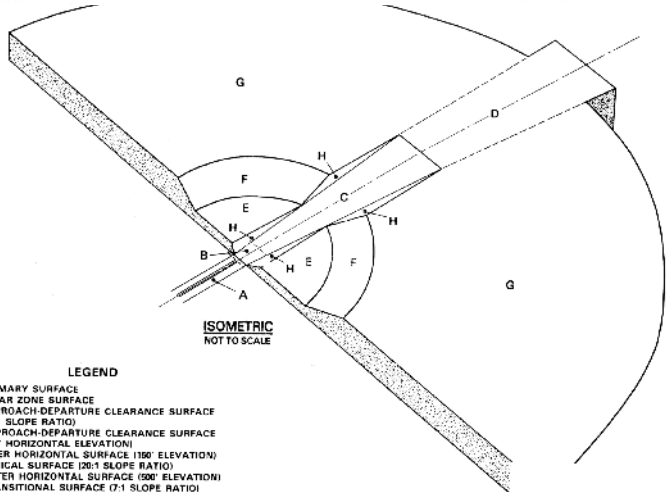


LEGEND

A PRIMARY SURFACE
B CLEAR ZONE SURFACE
C APPROACH-DEPARTURE CLEARANCE SURFACE (SLOPE)
D APPROACH-DEPARTURE CLEARANCE SURFACE (HORIZONTAL)
E INNER HORIZONTAL SURFACE
F CONICAL SURFACE
G OUTER HORIZONTAL SURFACE
H TRANSITIONAL SURFACE

GENERAL NOTES

1. Datum elevation for:
   a. surface D, E, F and G is the established airfield elevation.
   b. surface C is the runway centerline elevation at the threshold.
   c. surface H varies at each point along the runway centerline.
2. The intersections shown on the plan are for the case of a level runway.



LEGEND

A PRIMARY SURFACE
B CLEAR ZONE SURFACE
C APPROACH-DEPARTURE CLEARANCE SURFACE (50:1 SLOPE RATIO)
D APPROACH-DEPARTURE CLEARANCE SURFACE (500' HORIZONTAL ELEVATION)
E INNER HORIZONTAL SURFACE (150' ELEVATION)
F CONICAL SURFACE (20:1 SLOPE RATIO)
G OUTER HORIZONTAL SURFACE (500' ELEVATION)
H TRANSITIONAL SURFACE (7:1 SLOPE RATIO)

Figure 5-1 Imaginary Surfaces for Class B Runways

Sources
NAVFAC P-80.3 Airfield Safety Clearances, 1982

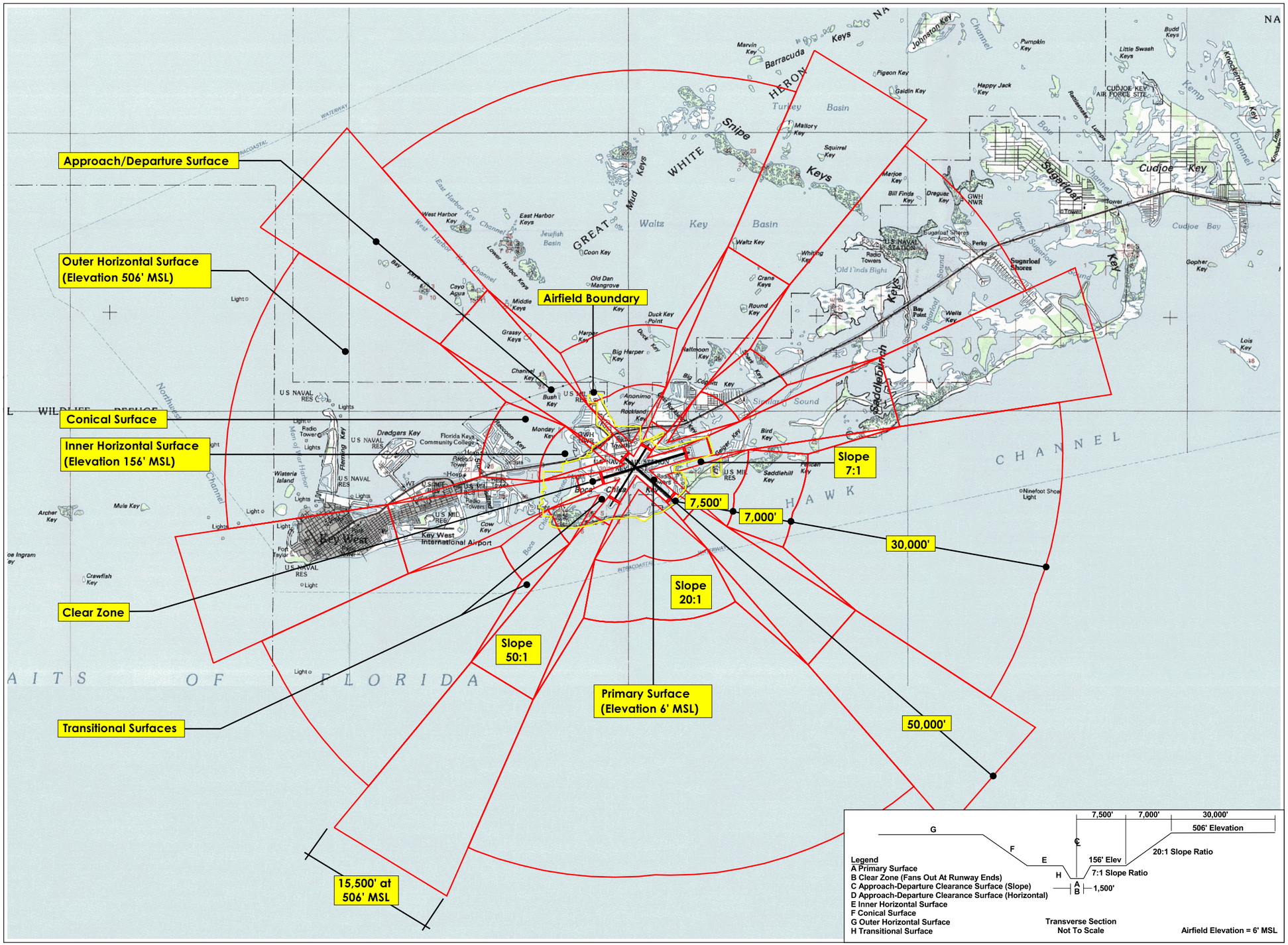
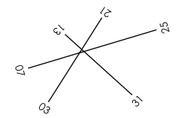
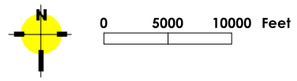


Figure 5-2
Imaginary Surfaces

Note
Airfield Elevation = 6' MSL

NAS Runways





Sources
USGS 1:100,000 DRG
NAVFAC Airfield Safety Clearances P-80.3, 1983

5.2 Accident Potential Zones

APZs are based on historical accident and operations data throughout the military and the application of margins of safety within those areas (which have been determined to be probable impact areas) if an accident were to occur. Criteria on APZs are found in OPNAVINST 11010.36B. Figure 5-3 details the geometry that is used to create the APZs for the Class B runways.

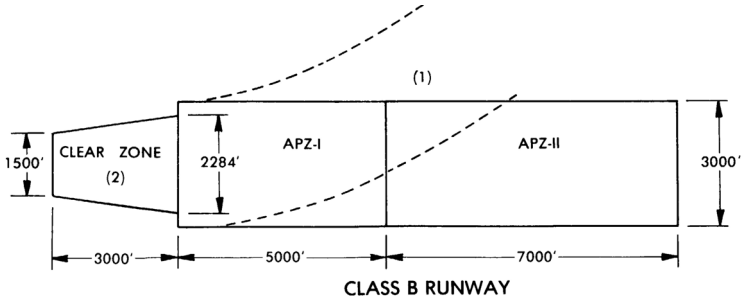
5.2.1 Fixed Wing Runway APZs

Figure 5-4 depicts the APZs for NAS Key West for CY07 operational levels. The U.S. Navy recognizes three APZs for Class B runways- The Clear Zone, APZ I, and APZ II are defined as follows:

- *Clear Zone*- The trapezoidal area lying immediately beyond the end of the runway and outward along the extended runway centerline for a distance of 3,000 feet. For U.S. Navy and Marine Corps installations, the dimensions are 1,500 feet in width at the runway threshold and 2,284 feet in width at the outer edge. The Clear Zone is required for all active runway ends.
- *APZ I*- The rectangular area beyond the Clear Zone, which still has a measurable potential for aircraft accidents relative to the Clear Zone. APZ I is provided under flight tracks, which experience 5,000 or more annual operations (departures or approaches). APZ I is typically 3,000 feet in width by 5,000 feet in length and may be rectangular, or curved to conform to the shape of the predominant flight track.
- *APZ II*- The rectangular area beyond APZ I (or the Clear Zone if APZ I is not used), which has a measurable potential for aircraft accidents relative to APZ I or the Clear Zone. APZ II is always provided where APZ I is required. The dimensions of APZ II are typically 3,000 feet wide by 7,000 feet in length, and as with APZ I, may be curved to correspond with the predominant flight track. Wherever an APZ I is warranted, an APZ II also exists.

As depicted in Figure 5-4, all runways have Clear Zones. Runways 07/25 and 13/31 experience 5,000 or more annual operations under certain flight tracks and as a result, have APZs associated with their use. The flight tracks generating the four APZ I and APZ IIs are 07D2, 13D1, 07O1 (final portion), and 13O1/13F1,2,3 (final portion)[1]. Runway 03/21, the crosswind runway, does not have any APZs associated with runway use because no flight tracks experience 5,000 or more annual operations.

Figure 5-3 Fixed-Wing Runway APZs



Source: OPNAVINST 11010.36B, 2002

Notes: (1) APZ I and II may be altered to conform to flight shadow. (2) The 2284' dimension is based on criteria of using a 7°-58'-11" flare angle for the approach departure surface where the outer width of that surface was established at 15,500'. This dimension would be 2312' where the outer width of the surface was established at 16,000'. Flare starts at 200' from end of runways and 3,000' Clear Zone length starts at runway end. See NAVFAC P-80.3 for more details.

[1] Current Navy policy does not depict APZs over water. Therefore, the APZs for flight track 13D1 are not illustrated in Figure 5-4.

5.2.2 Helicopter APZs

APZ guidelines for helicopters are much smaller than those for fixed-wing aircraft and are outlined below:

- *Clear Zone*- The take off safety zone for VFR rotary-wing 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 I*- An area beyond the Clear Zone for the remainder of the approach/departure zone, which is defined as the area under the VFR approach/departure surface until that surface is 150 feet above the established landing area elevation.
- *APZ II*- Normally not applied to helicopter flight paths unless the local accident history indicates the need for additional protection.

The Clear Zone for helicopters will be provided for all VFR landing pads/runways. The use of APZ-I will be provided for all VFR landing pads/runways located at air installations that support daily training and operations missions. Normally, helipads provided to support administrative functions and hospitals, which generate a low volume of helicopter operations, will not require APZ I or APZ II. APZs for helicopter operations are not illustrated in Figure 5-4. In addition, helicopter operations also occur at NAS Key West's Trumbo Point Annex and Fleming Key. Operations at these locations were not part of the scope of this update due to the current frequency of operations.

5.2.3 APZ Comparison 2007 (CY07) and 1977 AICUZ

Figure 5-4 illustrates the CY07 AICUZ APZs. Figure 5-5 compares the CY07 APZs with the APZs from the earlier AICUZ document dated 1977[2] which is still recognized by Monroe County. The APZs in the 1977 AICUZ were based on previous Navy criteria, which was updated and superseded in the late 1970s. Given that the criteria to create the 1977 configurations for APZ B and C is no longer used, the difference in 1977 and CY07 APZs are precluded from an equal and direct comparison. The 2007 APZs are based on current Navy criteria.

5.3 Airfield Safety Violations/Waivers

Airfield safety violations, in the form of flight obstructions, occur when any object, (natural, manmade, stationary, or mobile) penetrates the imaginary surfaces, as outlined in NAVFAC P-80.3. These airfield safety violations require waivers. Within Boca Chica Field, every effort should be made to eliminate existing airfield safety violations and waivers through the coordinated planning of future projects to ensure compliance with latest safety standards. New construction must follow the established criteria in NAVFAC P-80.3.

Flight obstructions are found penetrating the Primary Surfaces, the Type 1, 2, and 3 Clear Zones, and the 7:1 Transitional Surfaces at NAS Key West. A number of waivers have been granted to allow certain structures and uses not customarily permitted within the vicinity of an airfield. These structures and uses were deemed necessary and granted waivers by Naval Air Systems Command (NAVAIR). Figure 5-6 shows and lists the waivered obstructions.

Additionally there are obstructions not listed, which are unwaivered. Many of these unwaivered obstructions include operational structures such as lighting and signage. These operational structures remain unwaivered due to exemption by NAVFAC Manual P-80.3. It states that certain navigational and

[2] Air Installations Compatible Use Zones Study, NAS Key West, 1977.

operational aids normally are sited in violation of airspace safety clearances in order to operate effectively.

The following navigational and operational aids are in violation of airfield safety clearances, but do not require waivers from NAVAIR:

- Approach lighting system
- Visual Approach Slope Indicator
- POLS
- Runway distance markers
- Arresting gear systems
- Taxiway guidance, holding, and orientation signs
- All beacons and obstruction lights
- Arming and de-arming pads

The NAS Key West Air Operations Manual lists several local flight obstructions outside of NAS Key West property bounds. Local obstructions include a microwave tower, water tanks, radio towers, smokestacks and radar towers.

This page intentionally left blank.

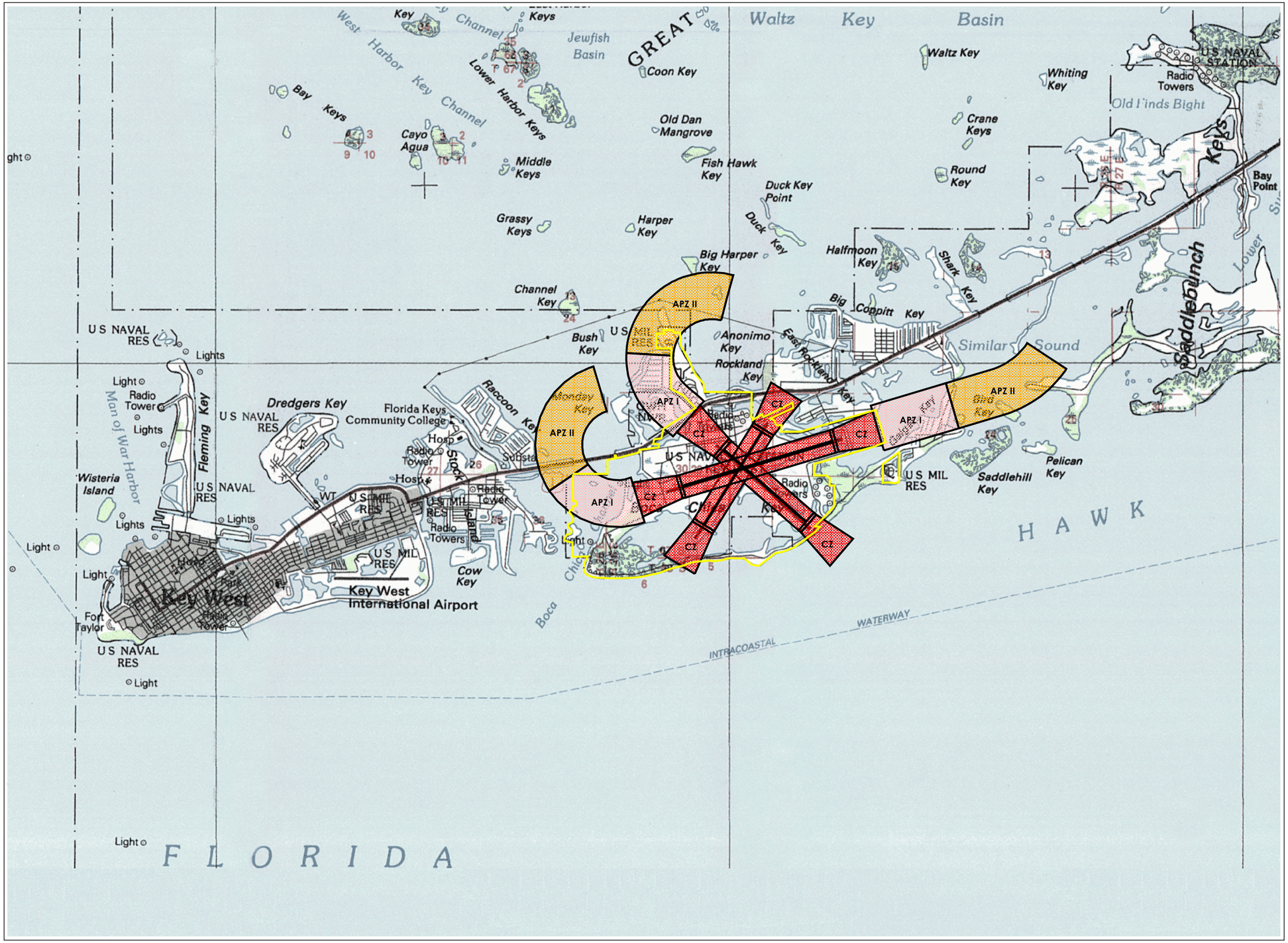


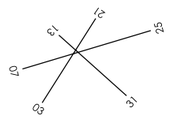
Figure 5-4

CY07 APZs

Legend
- Clear Zone and Primary Surface
- Accident Potential Zone I
- Accident Potential Zone II
- Airfield Boundary (Approximate)

Notes
APZ Accident Potential Zone
CZ Clear Zone

NAS Runways



N 0 2500 5000 Feet

Sources
NAS Key West, 2003
USGS 1:100,000 DRG

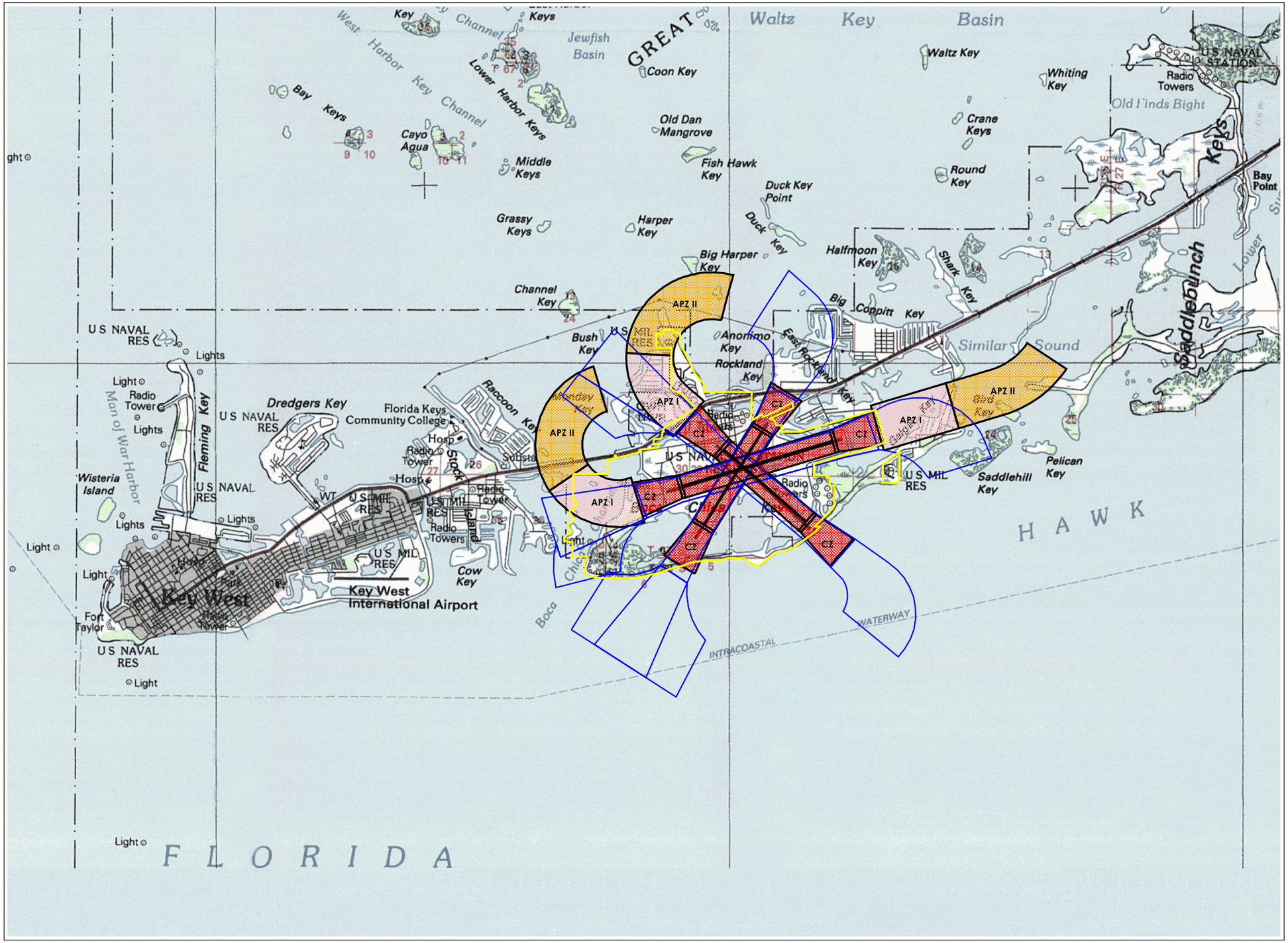


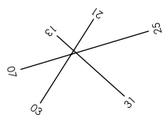
Figure 5-5

APZ Comparison 2007 and 1977

Legend
- Clear Zone and Primary Surface
- Accident Potential Zone I
- Accident Potential Zone II
- Clear Zone, Primary Surface, and APZs, 1977
- Airfield Boundary (Approximate)

Notes
APZ Accident Potential Zone
CZ Clear Zone

NAS Runways



0 2500 5000 Feet

Sources
NAS Key West, 2003
NAS Key West AICUZ Study, 1977
USGS 1:100,000 DRG

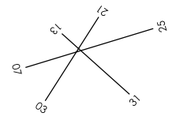
Figure 5-6

Waivered Obstructions

Legend

BC-06 Transformer - Wheels Up Lighting Control
BC-07 Fresnel Lens
BC-10 Radar Domes
BC-13 Transformer
BC-14 Bldg. A-986
BC-16 Hangar Bldg. A-131
BC-16a Utility Pole
BC-16b Light Pole
BC-17a Quonset Hut
BC-17b Utility Pole
BC-18 Bldg. A-515
BC-22a Utility Pole
BC-22b Utility Pole
BC-22c Firehouse Bldg. A-132
BC-23a Storage Facility
BC-23b Public Works Shop
BC-25 Tennis Courts
BC-28 Bldg. A-523
BC-29a Bldg. A-515
BC-30 Power Check Pads
BC-31 North South Line
BC-33 AN-GMQ-29 Automatic Weather Station
BC-34a Jet Engine Test Cell
BC-35a ASR-8 Radar
BC-35b AP/FPN-63 Precision Approach Radar
BC-35c Windsock
BC-35d ASR-8 Radar and Transmitter Site
BC-36 Jet Blast Deflector Fence
BC-37 AN/FPN-63 ILS Reflector
BC-38 Light Poles

NAS Runways



N

0 500 1000 Feet

Sources

NAVFACENGCOM SOUTHDIV, 2001
NAS Key West Image, September 2001
NAS Key West, 2006

5.4 Electromagnetic Interference and Radiation

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, 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 Electromagnetic Interference (EMI). EMI is defined by the American National Standards Institute (ANSI) 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 non-telecommunications equipment, such as vehicles and industrial machinery.

Consideration should be given that no on or off-station land uses create EMI for flight operations or communications among aviators and ground control personnel. According to personnel at NAS Key West, there are no major issues related to EMI at the airfield.

5.5 Lighting

Bright lights, either directed of reflected, in the vicinity of an airfield 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. Several recent pilot encounters with laser flashes from outdoor light at concerts, fairs, theme parks, and casinos have increased the awareness of this hazard. Spotlights and reflected light from glass exterior buildings can also impair pilot vision.

According to personnel at NAS Key West, there are no major issues related to off-station lighting in the vicinity of the airfield.

5.6 Smoke, Dust, and Steam

Unchecked land uses around airfields may emit smoke, fly ash, dust, steam, vapor, gases or other forms of air emissions that can impair visibility in the vicinity of the airfield, interfere with the safe operation of aircraft, and endanger the landing, take-off, or maneuvering of aircraft at the airfield. According to personnel at NAS Key West personnel, there are no major issues related to these types of air emissions at or in the vicinities of the airfield.

5.7 Bird and Animal Strike Hazards

Wildlife represents a significant hazard to flight operations. Birds, in particular, are drawn to the open grassy fields, pools of fresh water, and warm pavements of airfields. Although most bird and animal strikes do not result in crashes, they may involve extensive mechanical and structural damage to aircraft. Between 1987 and 1997, the military services reported nearly 30,000 collisions with birds and wildlife totaling more than $447 million in structural and mechanical damage as per 1999 U.S. Air Force reports. 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. A seagull colliding with an aircraft traveling at a speed of 400 mph will hit with a 32,000-foot pound 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
- Stormwater ponds

6.0 AICUZ and Land Use Compatibility Guidelines

The noise zones and APZs together form the AICUZ footprint for an air installation. The AICUZ footprint is the area where land use controls are needed to protect the health, safety, and welfare of those living near a military airfield.

Although ultimate control over land use and development in the vicinity of military facilities is the responsibility of local governments, the Navy encourages localities to adopt programs, policies, and regulations that promote compatible development within the AICUZ footprint where appropriate and feasible. This section presents the AICUZ footprint for NAS Key West and the recommended land use compatibility guidelines that Monroe County can model its regulations after.

6.1 AICUZ Footprint for NAS Key West

The AICUZ footprint is a combination of noise impact and APZs. Figure 6-1 presents the AICUZ footprint for NAS Key West.

The superimposed noise exposure levels and APZ boundaries normally create twelve potential sub zones within an AICUZ footprint. In light of the life style in the Florida Keys, the AICUZ footprint extends to the 60-dB DNL contour. As shown in Table 6-1, these sub zones contain various combinations of noise and accident potential exposure. The areas of Primary Surface/Clear Zone (designated as CZ), include the areas along the runway and at the runway ends along the primary flight paths. These areas can exist in conjunction with Noise Zones 1, 2, or 3. Due to the proximity to the runway, they are normally found in conjunction with the highest noise exposure. These areas have the greatest potential for the occurrence of aircraft accidents and should remain undeveloped.

Table 6-1 AICUZ Footprint Subzones

Accident Potential	Noise Zones		
	1 Below 65 Ldn	2 65-75 Ldn	3 Above 75 Ldn
Primary Surface / Clear Zone	CZ	CZ	CZ
APZ I	I-1	I-2	I-3
APZ II	II-1	II-2	II-3
Outside APZs	1	2	3

Source: OPNAVINST 11010.36B, 2002.

APZ I is beyond the Clear Zone and still possesses a measurable potential for accidents relative to the Clear Zone. These areas can exist in conjunction with Noise Zones 1, 2, or 3. The combinations of noise and accident potential are shown as I-3 (APZ I-Noise Zone 3) for the highest combination of noise and accident potential, I-2 (APZ I-Noise Zone 2) for areas of moderate noise exposure and measurable accident potential, and I-1 (APZ I-Noise Zone 1) for areas of measurable accident potential and low noise exposure. These areas have potential for accidents and noise impacts and land use controls are recommended in these areas.

APZ II is an area beyond APZ I and it has a measurable potential for aircraft accidents relative to APZ I or the Clear Zone. APZ II areas can exist in conjunction with Noise Zones 1, 2, or 3. These combinations of noise and accident potential are shown as II-3 (APZ II-Noise Zone 3) for the areas of highest noise exposure and measurable accident potential, II-2 (APZ II-Noise Zone 2) for areas of moderate noise exposure and measurable accident potential, and II-1 (APZ II-Noise Zone 1) for areas of measurable accident potential and low noise exposure. These areas have potential for accidents and noise impacts and land use controls are recommended.

Noise zones vary in intensity of noise exposure and are shown as 1, 2, and 3 in the table. Noise Zone 1 (less than 65 DNL) is an area of low impact where some land use controls may be needed, Noise Zone 2 (DNL 65-75) is an area of moderate impact where some land use controls are needed, and Noise Zone 3 (DNL 75 and above) is the most severely impacted area and requires the greatest degree of land use controls for noise exposure.

6.2 Suggested Land Use Compatibility within AICUZ Area

The Navy has developed land use compatibility recommendations for the APZs and noise zones as shown in Tables 6-2 and 6-3. These recommendations are intended to serve as guidelines, but final decisions as to specific land use controls to be enacted into zoning regulations are made by the local community. Noise sensitive uses including, but not limited to housing, schools, hospitals, churches, etc., are recommended to be placed outside of high noise areas. People intensive uses including, but not limited to such uses as shopping malls, theaters, and activities that would draw concentrations of people to an area, should be placed outside APZs. The purpose of the land use recommendations is not to preclude productive use of the land around Naval air facilities, but to recommend compatible future use of the land that is protective to human health, safety, and welfare.

Certain land uses are not recommended in very high noise areas and/or the APZs. Other land uses are considered compatible under certain conditions. For example, recreational uses, such as parks, are compatible under APZ 1, under the condition that the recreational use does not include a high density of people (e.g. spectator sports). Compatibility is a relative term and should be considered by local governments along with specific local land use development criteria.

The guidelines for suggested land use listed in Tables 6-2 and 6-3 are nationwide in scope. Since many air installations are in urban areas, these guidelines assume an urban environment with higher levels of ambient "background" noise that might exist in rural and suburban areas. These compatibility guidelines are, therefore, sometimes modified at the local government level to address a specific local noise environment. As noted previously in this report, the area from DNL 55 to 65 is an area where people can also sometimes be annoyed by aircraft overflight. Planners should consider this zone a buffer zone that may be impacted by higher noise levels if operations increase in the future.

The AICUZ footprint for this study includes the area from DNL 60 to 65 and recommendations are made for (1) fair disclosure statements regarding the noise levels to prospective owners and occupants and (2) site design and construction considerations to reduce the noise impact in residential areas in light of the life style in the Florida Keys. Design provisions such as berms can reduce the effect of sound traveling across the water. While many standard housing construction techniques provide some levels of sound attenuation, design considerations incorporating additional sound reduction in construction in this area can also help reduce energy consumption and should be considered. In the area from DNL 55 to 60, fair disclosure to occupants could also be considered in recognition of future unknowns.

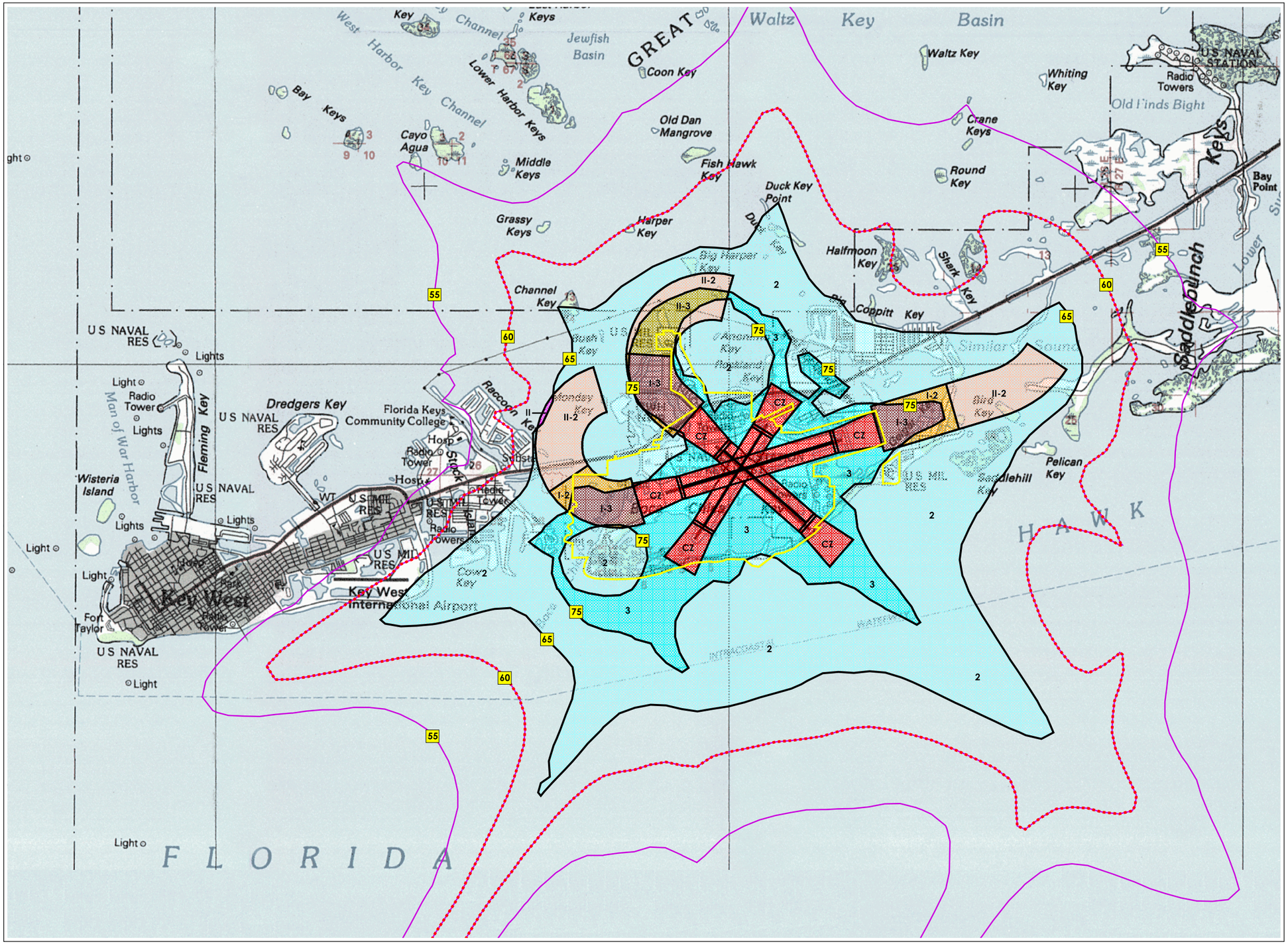


Figure 6-1

CY07 Combined Noise and APZ Footprint

	Primary Surface/ Clear Zone	APZ I	APZ II	
Noise Zone 1 (< 65 Ldn)	N/A	N/A	II	N/A
Noise Zone 2 (65-75 Ldn)	CZ	I-2	II-2	2
Noise Zone 3 (> 75 Ldn)	CZ	I-3	II-3	3

AICUZ Footprint

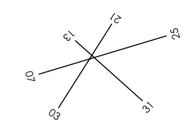
55 Ldn

Airfield Boundary (Approximate)

Notes

AICUZ Air Installations Compatible Use Zones
APZ Accident Potential Zone
CZ Clear Zone
Ldn Day-Night Average Sound Level

NAS Runways



Sources

NAS Key West, 2003
Wyle Laboratories, 2003/2005
USGS 1:100,000 DRG

Table 6-2 Suggested Land Use Compatibility in Noise Zones

Land Use		Suggested Land Use Compatibility						
		Noise Zone 1 (DNL or CNEL)		Noise Zone 2 (DNL or CNEL)		Noise Zone 3 (DNL or CNEL)		
SLUCM NO	LAND USE NAME	< 55	55- 64	65 - 69	70 -74	75- 79	80 -84	85+
	Residential							
11	Household Units	Y	Y [1]	N [1]	N [1]	N	N	N
11.11	Single units: detached	Y	Y [1]	N [1]	N [1]	N	N	N
11.12	Single units: semidetached	Y	Y [1]	N [1]	N [1]	N	N	N
11.13	Single units: attached row	Y	Y [1]	N [1]	N [1]	N	N	N
11.21	Two units: side-by-side	Y	Y [1]	N [1]	N [1]	N	N	N
11.22	Two units: one above the other	Y	Y [1]	N [1]	N [1]	N	N	N
11.31	Apartments: walk-up	Y	Y [1]	N [1]	N [1]	N	N	N
11.32	Apartment: elevator	Y	Y [1]	N [1]	N [1]	N	N	N
12	Group quarters	Y	Y [1]	N [1]	N [1]	N	N	N
13	Residential Hotels	Y	Y [1]	N [1]	N [1]	N	N	N
14	Mobile home parks or courts	Y	Y [1]	N	N	N	N	N
15	Transient lodgings	Y	Y [1]	N [1]	N [1]	N [1]	N	N
16	Other residential	Y	Y [1]	N [1]	N [1]	N	N	N
20	***Manufacturing***							
21	Food & kindred products; manufacturing	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
22	Textile mill products; manufacturing	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
23	Apparel and other finished products; products made from fabrics, leather and similar materials; manufacturing	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
24	Lumber and wood products (except furniture); manufacturing	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
25	Furniture and fixtures; manufacturing	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
26	Paper and allied products; manufacturing	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
27	Printing, publishing, and allied industries	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
28	Chemicals and allied products; manufacturing	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
29	Petroleum refining and related industries	Y	Y	Y	Y[2]	Y[3]	Y[4]	N

(Continued Next Page)

Table 6-2 Suggested Land Use Compatibility in Noise Zones (Continued)

Land Use		Suggested Land Use Compatibility						
		Noise Zone 1 *(DNL or CNEL)*		Noise Zone 2 *(DNL or CNEL)*		Noise Zone 3 *(DNL or CNEL)*		
SLUCM NO	LAND USE NAME	< 55	55- 64	65 - 69	70 -74	75- 79	80 -84	85+
30	***Manufacturing (continued)***							
31	Rubber and misc. plastic products; manufacturing	Y	Y	Y	Y [2]	Y [3]	Y [4]	N
32	Stone, clay and glass products; manufacturing	Y	Y	Y	Y [2]	Y [3]	Y [4]	N
33	Primary metal products; manufacturing	Y	Y	Y	Y [2]	Y [3]	Y [4]	N
34	Fabricated metal products; manufacturing	Y	Y	Y	Y [2]	Y [3]	Y [4]	N
35	Professional scientific, and controlling instruments; photographic and optical goods; watches and clocks	Y	Y	Y	25	30	N	N
39	Miscellaneous manufacturing	Y	Y	Y	Y [2]	Y [3]	Y [4]	N
40	***Transportation, communication and utilities.***							
41	Railroad, rapid rail transit, and street railway transportation	Y	Y	Y	Y [2]	Y [3]	Y [4]	N
42	Motor vehicle transportation	Y	Y	Y	Y [2]	Y [3]	Y [4]	N
43	Aircraft transportation	Y	Y	Y	Y [2]	Y [3]	Y [4]	N
44	Marine craft transportation	Y	Y	Y	Y [2]	Y [3]	Y [4]	N
45	Highway and street right-of-way	Y	Y	Y	Y [2]	Y [3]	Y [4]	N
46	Automobile parking	Y	Y	Y	Y [2]	Y [3]	Y [4]	N
47	Communication	Y	Y	Y	25 [5]	30 [5]	N	N
48	Utilities	Y	Y	Y	Y [2]	Y [3]	Y [4]	N
49	Other transportation, communication and utilities	Y	Y	Y	25 [5]	30 [5]	N	N
50	***Trade***							
51	Wholesale trade	Y	Y	Y	Y [2]	Y [3]	Y [4]	N
52	Retail trade – building materials, hardware and farm equipment	Y	Y	Y	Y [2]	Y [3]	Y [4]	N
53	Retail trade – shopping centers	Y	Y	Y	25	30	N	N
54	Retail trade - food	Y	Y	Y	25	30	N	N

(Continued Next Page)

Table 6-2 Suggested Land Use Compatibility in Noise Zones (Continued)

Land Use		Suggested Land Use Compatibility						
		Noise Zone 1 (DNL or CNEL)		Noise Zone 2 (DNL or CNEL)		Noise Zone 3 (DNL or CNEL)		
SLUCM NO	LAND USE NAME	< 55	55- 64	65 - 69	70 -74	75- 79	80 -84	85+
50	***Trade (Continued)***							
55	Retail trade – automotive, marine craft, aircraft and accessories	Y	Y	Y	25	30	N	N
56	Retail trade – apparel and accessories	Y	Y	Y	25	30	N	N
57	Retail trade – furniture, home, furnishings and equipment	Y	Y	Y	25	30	N	N
58	Retail trade – eating and drinking establishments	Y	Y	Y	25	30	N	N
59	Other retail trade	Y	Y	Y	25	30	N	N
60	***Services***							
61	Finance, insurance and real estate services	Y	Y	Y	25	30	N	N
62	Personal services	Y	Y	Y	25	30	N	N
62.4	Cemeteries	Y	Y	Y	Y [2]	Y [3]	Y [4,11]	Y [6,11]
63	Business services	Y	Y	Y	25	30	N	N
63.7	Warehousing and storage	Y	Y	Y	Y [2]	Y [3]	Y [4]	N
64	Repair Services	Y	Y	Y	Y [2]	Y [3]	Y [4]	N
65	Professional services	Y	Y	Y	25	30	N	N
65.1	Hospitals, other medical fac.	Y	Y [1]	25	30	N	N	N
65.16	Nursing Homes	Y	Y	N [1]	N [1]	N	N	N
66	Contract construction services	Y	Y	Y	25	30	N	N
67	Government Services	Y	Y [1]	Y [1]	25	30	N	N
68	Educational services	Y	Y [1]	25	30	N	N	N
69	Miscellaneous	Y	Y	Y	25	30	N	N
70	***Cultural, entertainment and recreational***							
71	Cultural activities (& churches)	Y	Y[1]	25	30	N	N	N
71.2	Nature exhibits	Y	Y[1]	Y[1]	N	N	N	N
72	Public assembly	Y	Y[1]	Y	N	N	N	N
72.1	Auditoriums, concert halls	Y	Y	25	30	N	N	N
72.11	Outdoor music shells, amphitheaters	Y	Y [1]	N	N	N	N	N
72.2	Outdoor sports arenas, spectator sports	Y	Y	Y [7]	Y [7]	N	N	N
73	Amusements	Y	Y	Y	Y	N	N	N
74	Recreational activities (include golf courses, riding stables, water rec.)	Y	Y[1]	Y[1]	25	30	N	N
75	Resorts and group camps	Y	Y [1]	Y [1]	Y [1]	N	N	N
76	Parks	Y	Y [1]	Y [1]	Y [1]	N	N	N
79	Other cultural, entertainment and recreation	Y	Y [1]	Y [1]	Y [1]	N	N	N

(Concluded Next Page)

Table 6-2 Suggested Land Use Compatibility in Noise Zones (Concluded)

Land Use		Suggested Land Use Compatibility						
		Noise Zone 1 (DNL or CNEL)		Noise Zone 2 (DNL or CNEL)		Noise Zone 3 (DNL or CNEL)		
SLUCM NO	LAND USE NAME	< 55	55- 64	65 - 69	70 -74	75- 79	80 -84	85+
80	***Resource Production and Extraction***							
81	Agriculture (except live stock)	Y	Y	Y [8]	Y [9]	Y [10]	Y [10,11]	Y [10,11]
81.5	Livestock farming	Y	Y	Y [8]	Y [9]	N	N	N
81.7	Animal breeding	Y	Y	Y [8]	Y [9]	N	N	N
82	Agriculture related activities	Y	Y	Y [8]	Y [9]	Y [10]	Y [10,11]	Y [10,11]
83	Forestry Activities	Y	Y	Y [8]	Y [9]	Y [10]	Y [10,11]	Y [10,11]
84	Fishing Activities	Y	Y	Y	Y	Y	Y	Y
85	Mining Activities	Y	Y	Y	Y	Y	Y	Y
89	Other resource production or extraction	Y	Y	Y	Y	Y	Y	Y

Key:

SLUCM Standard Land Use Coding Manual, U.S. Department of Transportation

Y (Yes) Land Use and related structures compatible without restrictions.

N (No) Land Use and related structures are not compatible and should be prohibited.

Y* (Yes with Restrictions) The land use and related structures are generally compatible. However, see note(s) indicated by the superscript.

N^x (No with Exceptions) The land use and related structures are generally incompatible. However, see notes indicated by the superscript.

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.

25, 30, or 35 The numbers refer to Noise Level Reduction levels. Land Use and related structures generally compatible however, measures to achieve NLR of 25, 30 or 35 must be incorporated into design and construction of structures. However, measures to achieve an overall noise reduction do not necessarily solve noise difficulties outside the structure and additional evaluation is warranted. Also, see notes indicated by superscripts where they appear with one of these numbers.

DNL Day Night Average Sound Level.

CNEL Community Noise Equivalent Level (Normally within a very small decibel difference of DNL)

Ldn Mathematical symbol for DNL.

Notes:

1.

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 locally prior to local 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 these uses must be allowed, measures to achieve and outdoor to indoor Noise Level Reduction (NLR) of at least 25 dB in DNL 65-69 and NLR of 30 dB in DNL 70-74 should be incorporated into building codes and be 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 a 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 noise exposure NLR particularly from ground level sources. Measures that reduce noise at a site should be used wherever practical in preference to measures that only protect interior spaces.

Notes (Continued):
2. 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 sensitive areas or where the normal noise level is low.

3. 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.

4. 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.

5. If project or proposed development is noise sensitive, use indicated NLR; if not, land use is compatible without NLR.

6. No buildings.

7. Land use compatible provided special sound reinforcement systems are installed.

8. Residential buildings require a NLR of 25

9. Residential buildings require a NLR of 30.

10. Residential buildings not permitted.

11. Land use not recommended, but if community decides use is necessary, hearing protection devices should be worn.

Source:
OPNAVINST 11010.36B, 2002

Table 6-3 Suggested Land Use Compatibility in Accident Potential Zones

SLUCM NO.	LAND USE NAME	CLEAR ZONE Recommendation	APZ-I Recommendation	APZ-II Recommendation	Density Recommendation
10	***Residential***				
11	Household Units				
11.11	Single units: detached	N	N	Y[2]	Maximum density of 1-2 Du/Ac
11.12	Single units: semidetached	N	N	N	
11.13	Single units: attached row	N	N	N	
11.21	Two units: side-by-side	N	N	N	
11.22	Two units: one above the other	N	N	N	
11.31	Apartments: walk-up	N	N	N	
11.32	Apartment: elevator	N	N	N	
12	Group quarters	N	N	N	
13	Residential Hotels	N	N	N	
14	Mobile home parks or courts	N	N	N	
15	Transient lodgings	N	N	N	
16	Other residential	N	N	N	
20	***Manufacturing*** [3]				
21	Food & kindred products; manufacturing	N	N	Y	Maximum FAR 0.56
22	Textile mill products; manufacturing	N	N	Y	Same as above
23	Apparel and other finished products; products made from fabrics, leather and similar materials; manufacturing	N	N	N	
24	Lumber and wood products (except furniture); manufacturing	N	Y	Y	Maximum FAR of 0.28 in APZ I & 0.56 in APZ II
25	Furniture and fixtures; manufacturing	N	Y	Y	Same as above
26	Paper and allied products; manufacturing	N	Y	Y	Same as above
27	Printing, publishing, and allied industries	N	Y	Y	Same as above
28	Chemicals and allied products; manufacturing	N	N	N	
29	Petroleum refining and related industries	N	N	N	

(Continued Next Page)

Table 6-3 Suggested Land Use Compatibility in Accident Potential Zones (Continued)

SLUCM NO.	LAND USE NAME	CLEAR ZONE Recommendation	APZ-I Recommendation	APZ-II Recommendation	Density Recommendation
30	***Manufacturing [3] (continued)***				
31	Rubber and misc. plastic products; manufacturing	N	N	N	
32	Stone, clay and glass products; manufacturing	N	N	Y	Maximum FAR 0.56
33	Primary metal products; manufacturing	N	N	Y	Same as above
34	Fabricated metal products; manufacturing	N	N	Y	Same as above
35	Professional scientific, & controlling instrument; photographic and optical goods; watches & clocks	N	N	N	
39	Miscellaneous manufacturing	N	Y	Y	Maximum FAR of 0.28 in APZ I & 0.56 in APZ II
40	***Transportation, communication and utilities [4].***				See Note 3 below.
41	Railroad, rapid rail transit, and street railway transportation	N	Y[5]	Y	Same as above.
42	Motor vehicle transportation	N	Y[5]	Y	Same as above
43	Aircraft transportation	N	Y[5]	Y	Same as above
44	Marine craft transportation	N	Y[5]	Y	Same as above
45	Highway and street right-of-way	N	Y[5]	Y	Same as above
46	Auto parking	N	Y[5]	Y	Same as above
47	Communication	N	Y[5]	Y	Same as above
48	Utilities	N	Y[5]	Y	Same as above
485	Solid waste disposal (Landfills, incineration, etc.)	N	N	N	
49	Other transport, comm. and utilities	N	Y[5]	Y	See Note 3 below
50	***Trade***				
51	Wholesale trade	N	Y	Y	Maximum FAR of 0.28 in APZ I. & .56 in APZ II.
52	Retail trade – building materials, hardware and farm equipment	N	Y	Y	Maximum FAR of 0.14 in APZ I & 0.28 in APZ II
53	Retail trade – shopping centers	N	N	Y	Maximum FAR of 0.22.
54	Retail trade - food	N	N	Y	Maximum FAR of 0.24
55	Retail trade – automotive, marine craft, aircraft and accessories	N	Y	Y	Maximum FAR of 0.14 in APZ I & 0.28 in APZ II
56	Retail trade – apparel and accessories	N	N	Y	Maximum FAR 0.28
57	Retail trade – furniture, home, furnishings and equipment	N	N	Y	Same as above
58	Retail trade – eating and drinking establishments	N	N	N	
59	Other retail trade	N	N	Y	Maximum FAR of 0.22

(Continued Next Page)

Table 6-3 Suggested Land Use Compatibility in Accident Potential Zones (Continued)

SLUCM NO.	LAND USE NAME	CLEAR ZONE Recommendation	APZ-I Recommendation	APZ-II Recommendation	Density Recommendation
60	***Services*** [6]				
61	Finance, insurance and real estate services	N	N	Y	Maximum FAR of 0.22 for "General Office/Office park"
62	Personal services	N	N	Y	Office uses only. Maximum FAR of 0.22.
62.4	Cemeteries	N	Y[7]	Y[7]	
63	Business services (credit reporting; mail, stenographic, reproduction; advertising)	N	N	Y	Max. FAR of 0.22 in APZ II
63.7	Warehousing and storage services	N	Y	Y	Max. FAR 1.0 APZ I; 2.0 in APZ II
64	Repair Services	N	Y	Y	Max. FAR of 0.11 APZ I; 0.22 in APZ II
65	Professional services	N	N	Y	Max. FAR of 0.22
65.1	Hospitals, nursing homes	N	N	N	
65.1	Other medical facilities	N	N	N	
66	Contract construction services	N	Y	Y	Max. FAR of 0.11 APZ I; 0.22 in APZ II
67	Government Services	N	N	Y	Max FAR of 0.24
68	Educational services	N	N	N	
69	Miscellaneous	N	N	Y	Max. FAR of 0.22
70	***Cultural, entertainment and recreational***				
71	Cultural activities	N	N	N	
71.2	Nature exhibits	N	Y[8]	Y[8]	
72	Public assembly	N	N	N	
72.1	Auditoriums, concert halls	N	N	N	
72.11	Outdoor music shells, amphitheaters	N	N	N	
72.2	Outdoor sports arenas, spectator sports	N	N	N	
73	Amusements -fairgrounds, mini-golf, driving ranges; amusement parks, etc	N	N	Y	
74	Recreational activities (including golf courses, riding stables, water rec.)	N	Y[8]	Y[8]	Max. FAR of 0.11 APZ I; 0.22 in APZ II
75	Resorts and group camps	N	N	N	
76	Parks	N	Y[8]	Y[8]	Same as 74
79	Other cultural, entertainment and recreation	N	Y[8]	Y[8]	Same as 74
80	***Resource production and extraction***				
81	Agriculture (except live stock)	Y[4]	Y[9]	Y[9]	
81.5, 81.7	Livestock farming and breeding	N	Y[9,10]	Y[9,10]	
82	Agriculture related activities	N	Y[9]	Y[9]	Max FAR of 0.28 APZ I; 0.56 APZ II no activity which produces smoke, glare, or involves explosives
83	Forestry Activities [11]	N	Y	Y	Same as Above
84	Fishing Activities [12]	N[12]	Y	Y	Same as Above

(Concluded Next Page)

Table 6-3 Suggested Land Use Compatibility in Accident Potential Zones (Concluded)

SLUCM NO.	LAND USE NAME	CLEAR ZONE Recommendation	APZ-I Recommendation	APZ-II Recommendation	Density Recommendation
85	Mining Activities	N	Y	Y	Same as Above
89	Other resource production or extraction	N	Y	Y	Same as Above
90	***Other***				
91	Undeveloped Land	Y	Y	Y	
93	Water Areas	N[13]	N[13]	N[13]	

Key:

SLUCM	Standard Land Use Coding Manual, U.S. Department of Transportation
Y (Yes)	Land use and related structures are normally compatible without restriction.
N (No)	Land use and related structures are not normally compatible and should be prohibited.
Y^x	(Yes with restrictions) the land use and related structures are generally compatible. However, see notes indicated by the superscript.
N^x	(No with exceptions) the land use and related structures are generally incompatible. However, see notes indicated by the superscript.
FAR	Floor Area Ratio. A floor area ratio is the ratio between the square feet of floor area of the building and the site area. It is customarily used to measure non-residential intensities.
Du/Ac	Dwelling Units per Acre. This metric is customarily used to measure residential densities.

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 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 I, and 50 per acre in APZ II are the range of occupancy levels considered to be low density. Outside events should normally be limited to assemblies of not more that 25 people per acre in APZ I, and maximum assemblies of 50 people per acre in APZ II.

2. The suggested maximum density for detached single-family housing is one to two 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 leave 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.

4. 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.

5. No passenger terminals and no major above ground transmission lines in APZ I.

6. Low intensity office uses only. Accessory uses such as meeting places, auditoriums, etc. are not recommended.

7. No Chapels are allowed within APZ I or APZ II.

8. Facilities must be low intensity, and provide no tot lots, etc. Facilities such as clubhouses, meeting places, auditoriums, large classes, etc. are not recommended.

9. 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.

10. Includes feedlots and intensive animal husbandry.

11. 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.

12. Controlled hunting and fishing may be permitted for the purpose of wildlife management.

13. Naturally occurring water features (e.g., rivers, lakes, streams, wetlands) are compatible.

Source:
OPNAVINST 11010.36B, 2002

This page intentionally left blank.

7.0 Land Use Compatibility Analysis

This section assesses the existing zoning, existing land use, and future land use in the vicinities of NAS Key West to determine compatibility with the aircraft noise zones and APZs that when combined, form the AICUZ footprint. NAS Key West's Boca Chica Field is located just east of the City of Key West in an unincorporated area of Monroe County, Florida. The AICUZ footprint is located within both the County and City jurisdictions today.

7.1 Existing Zoning

Land use in the vicinity of NAS Key West is regulated by ordinances for both the City of Key West[1] and Monroe County[2]. The Monroe County ordinance also recognizes the 1977 AICUZ Study recommendations for NAS Key West by establishing an AICUZ in the areas surrounding the airfield. The AICUZ acts as a zoning overlay that adds additional restrictions to the existing local zoning. Figure 7-1 depicts the generalized existing zoning in the vicinity of NAS Key West including the 1977 AICUZ footprint recognized by the county[3]. The figure also overlays the CY07 AICUZ footprint. The 1977 AICUZ footprint is located entirely within Monroe County.

The Monroe County ordinance regulates development in the AICUZ by referring to and borrowing from the 1977 AICUZ Study's AICUZ Map and Land Use Objectives Matrix per the following language[4]:

> Restrictions for military airports: Privately owned property adjacent to the Naval Air Station, Boca Chica, also known as NAS Key West, shall be developed in accordance with the map prepared by the U.S. Navy known as Figure A *(1977 AICUZ Map, See Figure 7-1 or Appendix A)* or as updated by the U.S. Navy. This map was prepared in conjunction with the United States Navy's Air Installation Compatible Use Zone Study (AICUZ).
>
> The land use objectives set forth in figure A and the accompanying land use objectives matrix set forth in Figure B *(1977 Land Use Objectives Matrix, See Appendix A)* were determined by evaluating the airport operations at NAS Key West, in terms of composite noise rating (CNR) zones and accident potential zones (APZ).
>
> The land use objective shown in figure A and figure B shall be used in determining the allowable land uses for the various AICUZ. Each land use category was evaluated in terms of compatibility for each land use in terms of density of population, density of structures, explosion hazards, air pollution height obstructions, accident potential zones, and composite noise rating zones.

Both the city and county's ordinances also recognize federal requirements related to lighting, flight obstructions, visual hazards, and electronic interference in the vicinity of NAS Key West. The ordinances regulate uses such as lighting that mislead aircraft, structures that obstruct flight within the imaginary surfaces, visual hazards that limit visibility, and electronic interference that effects aircraft systems. Overall, the provisions contained in both the city and the county's ordinances essentially reflect the recommendations of the 1977 AICUZ and federal requirements for areas surrounding airfields.

Relevant sections of both the City of Key West and Monroe County's ordinances are contained in Appendix A.

[1] City of Key West Code of Ordinances, Land Development Regulations, 2006; See Appendix A.
[2] Monroe County Code of Ordinances, Land Development Regulations, 2006; See Appendix A.
[3] Legend in Figure 7-1 generalizes actual zoning for map readability and understanding. GIS digital files can be used to query and view specific zoning districts.
[4] Monroe County Code of Ordinances, Land Development Regulations, Section 9.5-252, Airport Districts, 1989; See Appendix A.

7.2 On-Station Existing Land Use and Compatibility

Existing on-station land use at NAS Key West's Boca Chica Field can be classified into the following areas:

- Operations- Facilities essential to the core operations of the airfield such as aircraft hangars and the tower.
- Administration- Includes administrative facilities that support airfield and other installation operations, regional missions, community services, and housing functions.
- Logistics- Includes facilities that primarily house and provide supplies in support of airfield operations.
- Mission Support- Includes training, communications, ordnance, fuels, public works, and public safety facilities.
- Community Support- Includes medical, family services, commissary and exchange, club, and recreation facilities and areas.
- Visitor Quarters/Bachelor Housing- Includes bachelor housing and dining facilities.
- Open Space- Includes environmentally sensitive areas, wetlands, and undeveloped lands.

Aside from open space, the dominant land uses at NAS Key West include areas devoted to airfield operations, administrations, logistics, and mission support. The central core of development is located due north of the airfield pavement and includes administrative, public works, and community support, and visitor quarters.

As highlighted in Section 5.3, flight obstructions are found penetrating the Primary Surfaces, Clear Zones, and 7:1 Transitional Surfaces at NAS Key West, primarily within the central core of development. A number of waivers have been granted for structures and uses that were deemed necessary to NAS Key West's mission.

Since most of the Boca Chica Field and its supporting facilities are located within Noise Exposure Zone 3, sound attenuation is provided in new construction or major rehabilitation of noise sensitive uses. According to NAS Key West personnel, most of the structures with noise sensitive uses are currently sound attenuated.

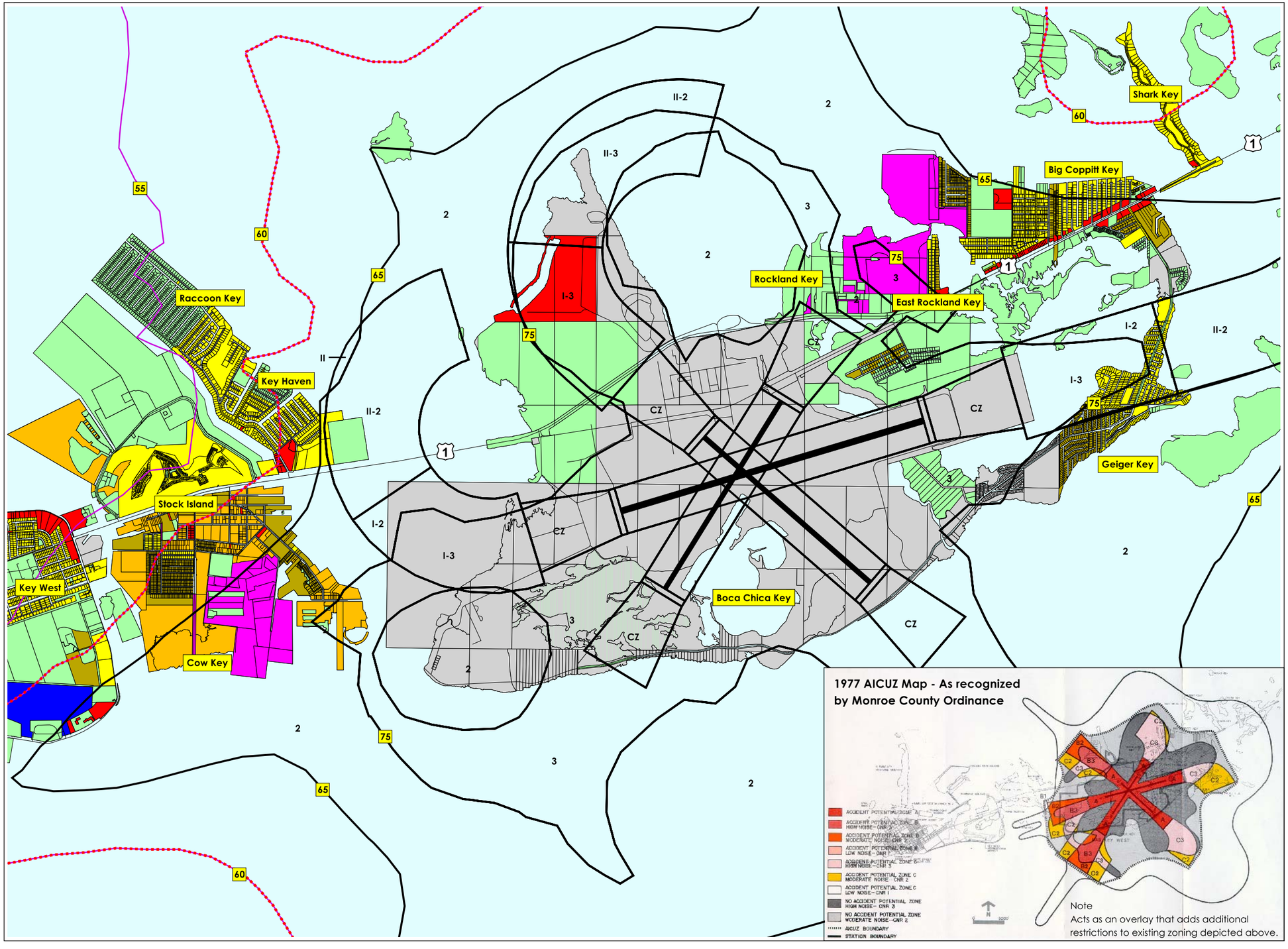


Figure 7-1
Existing Zoning and CY07 AICUZ

Legend

- High Density Residential (Includes Mobile Homes and RVs)
- Medium and Low Density Residential
- Commercial
- Military
- Mixed Use/Historical
- Conservation/Public (Includes Submerged Lands)
- Industrial
- Civilian Airport

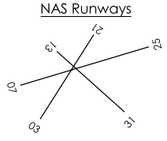
	Primary Surface/ Clear Zone	APZ I	APZ II	
Noise Zone 1 (< 65 Ldn)	N/A	N/A	II	N/A
Noise Zone 2 (65-75 Ldn)	CZ	I-2	II-2	2
Noise Zone 3 (> 75 Ldn)	CZ	I-3	II-3	3

- AICUZ Footprint
- 55 Ldn

Notes

-Roadways may appear as land use or water color.
-Legend generalizes actual land use by grouping similar parcel codes. GIS digital files can be used to query specific parcel codes.
-AICUZ Air Installations Compatible Use Zones
-APZ Accident Potential Zone
-CZ Clear Zone
-Ldn Day-Night Average Sound Level

NAS Runways



N

0 1000 2000 Feet

Sources

NAS Key West, 2003
NAS Key West AICUZ Study, 1977
USGS 1:100,000 DRG
Monroe County GIS, 2004

7.3 Off-Station Existing Land Use and Compatibility

Development surrounding NAS Key West is illustrated in Figure 7-2 and can be classified into the following areas[6]:

- High Density Residential- 6 or more dwelling units per acre. Includes mobile homes and recreational vehicle (RV) areas.
- Medium Density Residential- 3 to 6 dwelling units per acre.
- Low Density Residential- 0 to 3 dwelling units per acres.
- Commercial
- Vacant/Submerged
- Military
- Mixed Use/Historical
- Public/Government
- Recreational
- Institutional

As illustrated in Figure 7-2, existing residential development is located east of the airfield boundary on portions of Big Coppitt and Geiger Keys. In addition, the area east of the airfield is characterized with commercial development along U.S. Route 1 and light industrial development on Rockland Key. The Navy purchased numerous undeveloped lots totaling over 600 acres outside the airfield boundary to the east of NAS Key West in the 1980s to prevent further encroachment[7]. These lots are located adjacent to and within the residential areas on Geiger and Boca Chica Keys and are illustrated in Figure 7-3, Monroe County Real Estate (Parcel) Map Denoting Federally Owned Land and Development..

To the west, the airfield is bounded by water and vacant/submerged lands on Boca Chica Key. The Navy obtained a compatible development agreement[8] for the privately owned area on the northwest end of Boca Chica Key that restricts land use. Across Boca Chica Channel, development on Raccoon Key and Key Haven, Stock Key, and Cow Key is again characterized with residential, industrial, and commercial uses along with pockets of mixed use areas and undeveloped/conservation/agricultural lands.

Figure 7-4 provides the AICUZ overlaid on imagery of the area. Figure 7-5 illustrates the location of the land areas of significance within the AICUZ as discussed in Table 7-1. The table follows the figure and provides a detailed land use compatibility analysis within the noise and safety zones of the updated AICUZ footprint by key[9]. Within the updated AICUZ footprint, the majority of non-Navy owned lands/parcels are developed or submerged.

[6] These generalized land use categories work to encompass the different categories used by Monroe County and the City of Key West in their zoning regulations.
[7] NAS Key West Fee Acquisition Maps as Tabulated by NAS Key West Personnel, 2003.
[8] Agreements for areas of Boca Chica Key, 1980s and 1990s. See Appendix B.
[9] Analysis based on recommendations within Chief of Naval Operations Instruction (OPNAVINST) 11010.36B, Air Installations Compatible Use Zones Program, dated December 19, 2002. GIS used to calculate areas.

This page intentionally left blank.

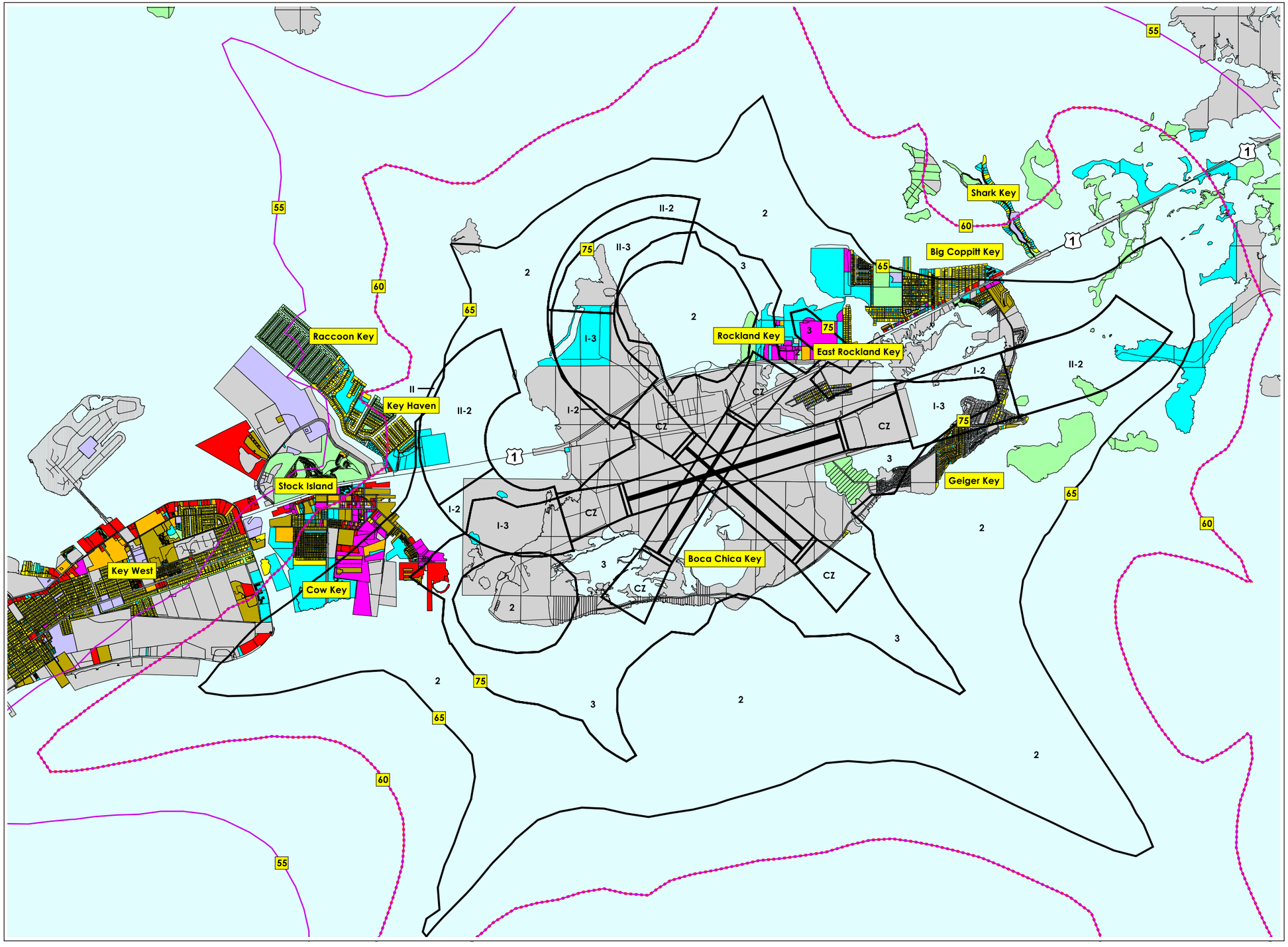


Figure 7-2

Existing Land Use and CY07 AICUZ

Legend

- High Density Residential (Includes Mobile Homes and RVs)
- Medium and Low Density Residential
- Commercial
- Mixed-Use/Historical
- Industrial
- Institutional (Includes Navy Hospital)
- Public/Government/Military
- Recreational/Conservation/Submerged
- Vacant/Submerged

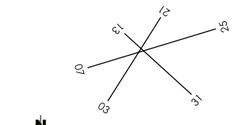
	Primary Surface/ Clear Zone	APZ I	APZ II	
Noise Zone 1 (< 65 Ldn)	N/A	N/A	II	N/A
Noise Zone 2 (65-75 Ldn)	CZ	I-2	II-2	2
Noise Zone 3 (> 75 Ldn)	CZ	I-3	II-3	3

- AICUZ Footprint
- 55 Ldn

Notes

-Roadways may appear as land use or water color.
-Legend generalizes actual land use by grouping similar parcel codes. GIS digital files can be used to query specific parcel codes.
-AICUZ Air Installations Compatible Use Zones
-APZ Accident Potential Zone
-CZ Clear Zone
-Ldn Day-Night Average Sound Level

NAS Runways



Sources

NAS Key West, 2003
USGS 1:100,000 DRG
Monroe County GIS, 2006

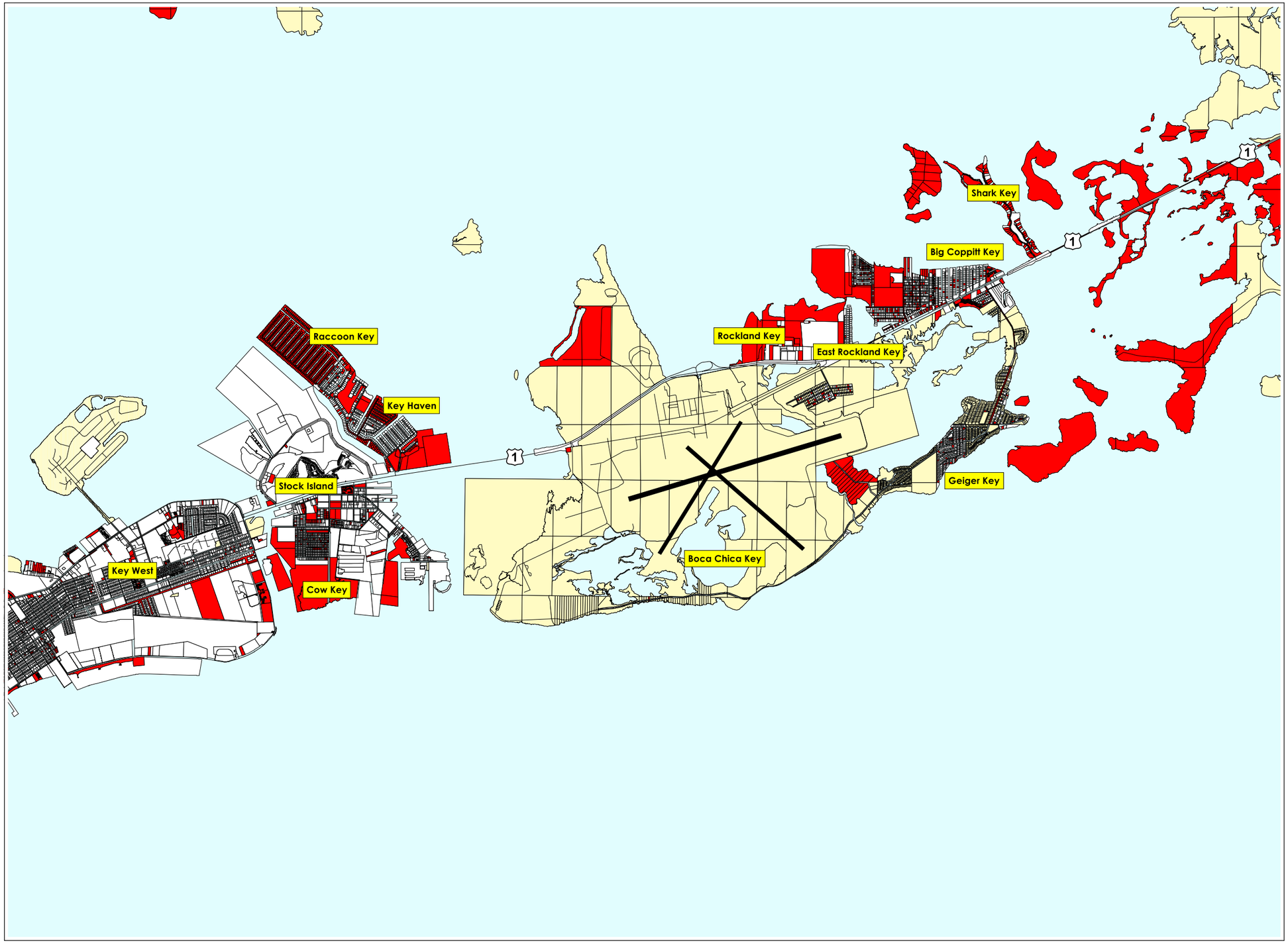


Figure 7-3

Monroe County Real Estate (Parcel) Map Denoting Federally Owned Land and Development

Legend

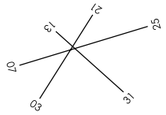
- Federally Owned Land
- Developed Non-Federally Owned Land
- Undeveloped Non-Federally Owned Land

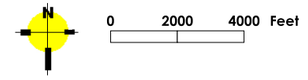
Note

-Roadways may appear blue, as well as white.

-Parcels may be submerged.

NAS Runways





Sources

NAS Key West, 2003

Monroe County GIS, 2006

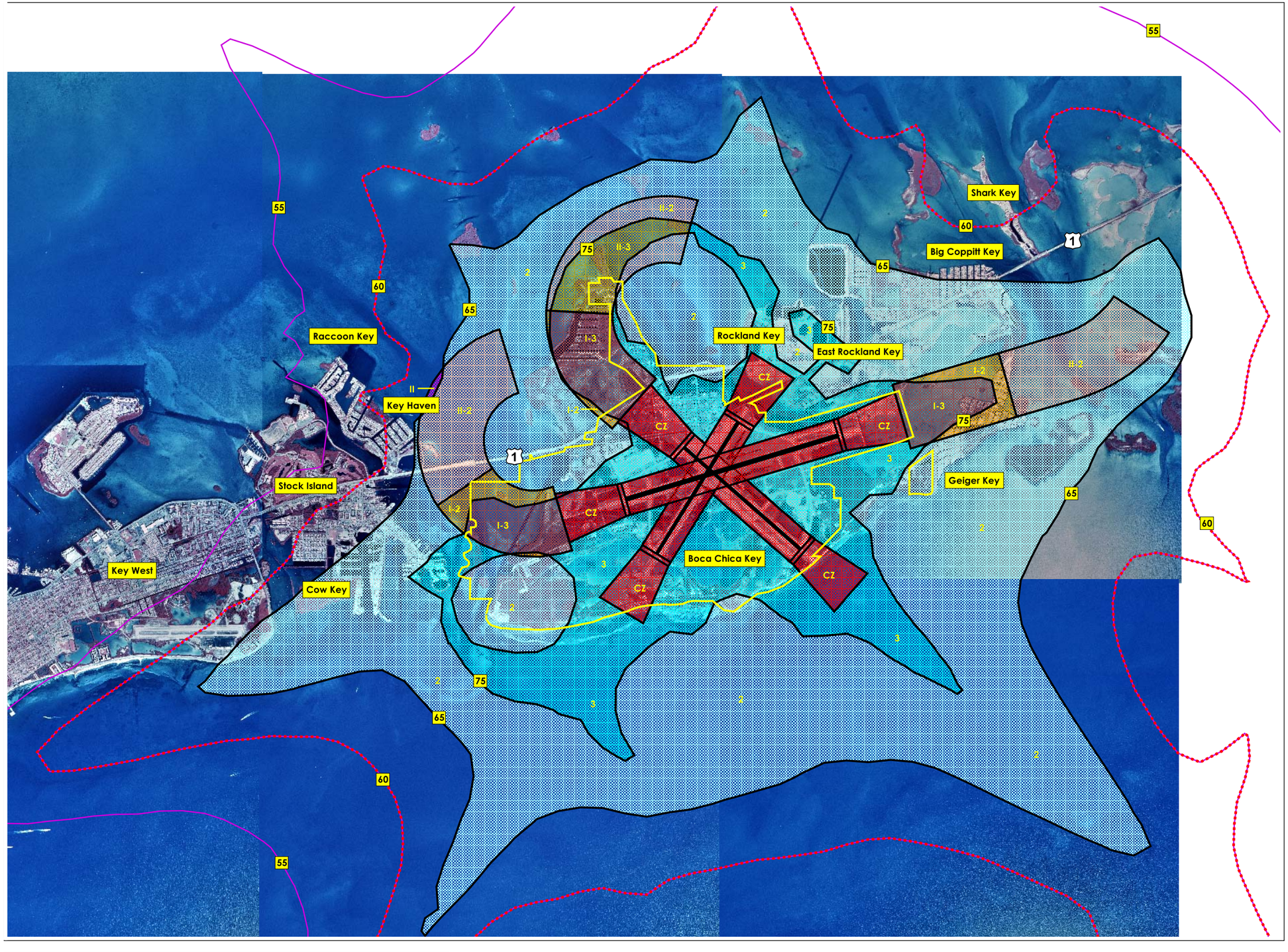


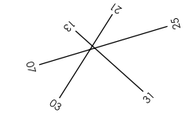
Figure 7-4
CY07 AICUZ and Aerial Image

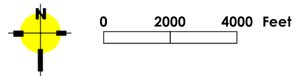
	Primary Surface/ Clear Zone	APZ I	APZ II	
Noise Zone 1 (< 65 Ldn)	N/A	N/A	II	N/A
Noise Zone 2 (65-75 Ldn)	CZ	I-2	II-2	2
Noise Zone 3 (> 75 Ldn)	CZ	I-3	II-3	3

AICUZ Footprint
55 Ldn
Airfield Boundary (Approximate)

Notes
AICUZ Air Installations Compatible Use Zones
APZ Accident Potential Zone
CZ Clear Zone
Ldn Day-Night Average Sound Level

NAS Runways





Sources
NAS Key West, 2003/2005
USGS 1:24,000 DOQ, 2000

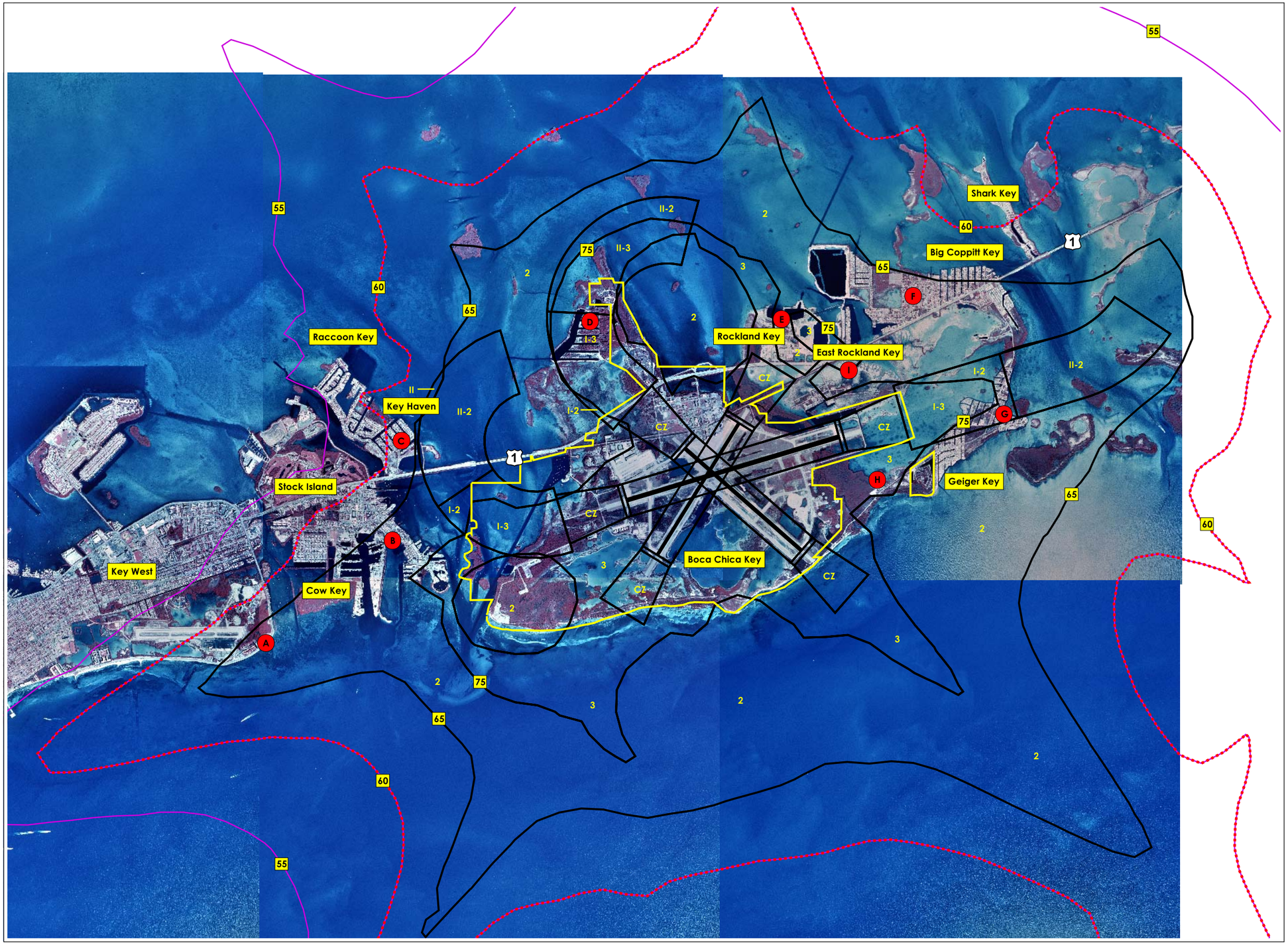


Figure 7-5
Land Areas of Significance- AICUZ

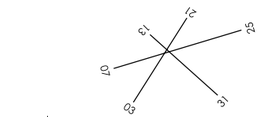
- A City of Key West (Southeast)
- B Cow Key/Stock Island (Southeast)
- C Raccoon Key/Key Haven (Southeast)
- D Boca Chica Key (Northwest)
- E Rockland Key
- F Big Coppitt Key
- G Geiger Key
- H Boca Chica Key (Southeast)
- I East Rockland Key

	Primary Surface/ Clear Zone	APZ I	APZ II	
Noise Zone 1 (< 65 Ldn)	N/A	N/A	II	N/A
Noise Zone 2 (65-75 Ldn)	CZ	I-2	II-2	2
Noise Zone 3 (> 75 Ldn)	CZ	I-3	II-3	3

- AICUZ Footprint
- 55 Ldn
- Airfield Boundary (Approximate)

Notes
AICUZ Air Installations Compatible Use Zones
APZ Accident Potential Zone
CZ Clear Zone
Ldn Day-Night Average Sound Level

NAS Runways



Sources
NAS Key West, 2003
USGS 1:24,000 DOQ, 2000

Table 7-1 Land Areas of Significance- AICUZ

Area	AICUZ Area and Zoning Description	Zoning		Existing Land Use		Analysis/Recommendations
		Compatible	Incompatible	Developed	Undeveloped	
A City of Key West (Southeast)	**DNL 65-75** • Commercial (Hotels, Restaurants) • Public/Institutional (Airport, Museum) • Conservation (Mangroves)	42 AC		29 AC	13 AC	Undeveloped area is zoned conservation and is compatible with AICUZ recommendations. Residential use/development is discouraged from DNL 65 to 70 and strongly discouraged from DNL 70 to 75. Any new noise sensitive developments should include sound attenuation. Noise disclosure statements should also be considered in the sale and rental of noise sensitive uses.
B Cow Key/Stock Island (Southeast)	**DNL 65-75** • Mixed-Use (Residential, Commercial) • Industrial (Maritime, Utilities) • Residential (Medium-High Density) • Conservation (Mangroves) **DNL 75-80** • Mixed-Use (Maritime)	55 AC	100 AC 30 AC	105 AC 30 AC	50 AC	Area is largely developed and has been for many years. Undeveloped areas are largely mangroves, although current zoning is mixed use which allows for residential development in these areas. Note: Development of mangrove areas is strictly regulated by Monroe County. Existing maritime uses such as boat repair and storage are compatible. Any new residential development, including live-aboard houseboats, should be discouraged. Residential use/development is discouraged from DNL 65 to 70 and strongly discouraged from DNL 70 to 75. Residential use/development should be prohibited in DNL 75 and above. While portions of Cow Key/Stock Island are in an area below DNL 65, this situation could change in the future and sound attenuation should be considered in any new noise sensitive developments. Noise disclosure statements should also be considered in the sale and rental of noise sensitive uses.
C Raccoon Key and Key Haven (Southeast)	**DNL 65-75** • Residential (Low and Medium Density) • Conservation (Mangroves)		6 AC		6 AC	Small area within DNL 65 or above is undeveloped and partially covered by mangroves/submerged. Zoning allows for residential uses in undeveloped area. Residential use/development is discouraged from DNL 65 to 70 and strongly discouraged from DNL 70 to 75. While most of Raccoon Key and Key Haven are in an area below DNL 65, this situation could change in the future and sound attenuation should be considered in any new noise sensitive developments. Noise disclosure statements should also be considered in the sale and rental of noise sensitive uses.

(Continued Next Page)

Table 7-1 Land Areas of Significance- AICUZ (Continued)

Area	AICUZ Area and Zoning Description	Zoning		Existing Land Use		Analysis/Recommendations
		Compatible	Incompatible	Developed	Undeveloped	
D Boca Chica Key (Northwest)	**DNL 75 and Above and APZ I** • 1977 AICUZ Overlay Zoning is in place over commercial base zoning. • Undeveloped privately owned area with Navy easements in place that restrict use.	114 AC			114 AC	Continue zoning and easement restrictions on use. Area south of privately owned area with Navy easements is Federally owned, submerged, and not included in totals. Residential use/development should be prohibited in DNL 75 and above and APZ I. Any new noise sensitive developments should include sound attenuation. Noise disclosure statements should also be considered in the sale and rental of noise sensitive uses.
E Rockland Key	**DNL 70 and Above** • 1977 AICUZ Overlay Zoning is in place over industrial, commercial, conservation, and residential base zoning.	271 AC		181 AC	90 AC	Existing industrial and conservation areas are compatible with environs. Residential use/development is strongly discouraged from DNL 70 to 75. Residential use/development should be prohibited in DNL 75 and above. Any new noise sensitive developments should include sound attenuation. Noise disclosure statements should also be considered in the sale and rental of noise sensitive uses.
F Big Coppitt Key	**DNL 65-70** • 1977 AICUZ Overlay Zoning is in place over residential, industrial, commercial, and conservation zoning.	581 AC		428 AC	153 AC	Big Coppitt Key is largely developed with residential and commercial uses. Remaining areas are zoned conservation with a few small tracts (6 acres or less) of undeveloped land zoned for residential development. The Federal government owns approximately 50 acres of undeveloped lands south of U.S. Route 1. Residential use/development is discouraged from DNL 65 to 70. Any new noise sensitive developments should include sound attenuation. Noise disclosure statements should also be considered in the sale and rental of noise sensitive uses.

(Concluded Next Page)

Table 7-1 Land Areas of Significance- AICUZ (Concluded)

Area	AICUZ Area and Zoning Description	Zoning		Existing Land Use		Analysis/Recommendations
		Compatible	Incompatible	Developed	Undeveloped	
G Geiger Key	**DNL 65-75** • Residential **DNL 65-75 and APZ II** • Residential **DNL 65-75 and APZ I** • Residential **DNL 75 and Above and APZ I** • Residential • 1977 AICUZ Overlay Zoning is in place in all areas.	98 AC 12 AC 60 AC 39 AC		67 AC 16 AC 6 AC	31 AC 12 AC 44 AC 33 AC	Geiger Key is partially developed with residential uses and limited commercial uses including a restaurant/marina/RV park. The Navy owns most of the undeveloped land in this area. Residential use/development is discouraged from DNL 65 to 70 and strongly discouraged from DNL 70 to 75. Residential use/development should be prohibited in DNL 75 and above. Residential use/development should also be prohibited in APZ I and regulated in APZ II. Any new noise sensitive developments should include sound attenuation. Noise disclosure statements should also be considered in the sale and rental of noise sensitive uses.
H Boca Chica Key (Southeast)	**DNL 65-75 and 75 and Above** 1977 AICUZ Overlay Zoning is in place over military use base zoning.	222 AC			222 AC	The Navy owns most of the undeveloped lands in this area outside of the airfield boundary. Residential use/development is discouraged from DNL 65 to 70 and strongly discouraged from DNL 70 to 75. Residential use/development should be prohibited in DNL 75 and above. Any new noise sensitive developments should include sound attenuation. Noise disclosure statements should also be considered in the sale and rental of noise sensitive uses.
I East Rockland Key	**DNL 70 and Above** 1977 AICUZ Overlay Zoning is in place and underlying zoning is conservation.	220 AC		12 AC	208 AC	Some residential development exists in this area. The Navy owns most of the undeveloped lands in this area. Residential use/development is strongly discouraged from DNL 70 to 75. Residential use/development should be prohibited in DNL 75 and above. Any new noise sensitive developments should include sound attenuation. Noise disclosure statements should also be considered in the sale and rental of noise sensitive uses.

Notes: Information in table created using GIS analysis. AC Acres.

This page intentionally left blank.

7.4 County and City Population Trends

Population trends can serve as a forecaster for future development. Table 7-2 presents the 1990 and 2000 populations for all of Monroe County and for the City of Key West. The county and city experienced slow population growth over the decade when compared with the 13% U.S. average. The slow population growth was attributable to a number of factors including the lack of undeveloped land available for building, and tourism detracting from the housing available for permanent residents. Tourism detracts from the housing available for permanent residents as hotels, resorts, time-shares, and seasonal rentals are sited on both developed and undeveloped lands. This growth turned negative between 2000 and 2003 with both the Monroe County and the City of Key West experiencing population losses. This growth turned negative between 2000 and 2003 with both the Monroe County and the City of Key West experiencing population losses.

Table 7-2 US Census Populations

	US Census Population (Persons)			Change (Persons)	
	1990	2000	2003	1990-2000	2000-2003
Monroe County*	78,024	79,589	76,329	1,565	-3,260
City of Key West	24,872	25,478	25,031	606	-477

Source: US Census 2000 and 2007
Note: *Includes the City of Key West

Significant increases in population are not expected in either the city or county over the next several decades[10]. While the population of Florida is projected to grow by over 30 percent through 2030 from 8 million to over 24 million residents, the population of Monroe County is projected to increase by only 9 percent, or approximately 7,200 persons.

7.5 Off-Station Future Land Use

Pressure to make significant changes in future land use are expected around NAS Key West. In addition to limited population growth, most of the land is already developed or compatibly zoned. Several major future developments are proposed in the area. Monroe County's ordinance recognizes the 1977 AICUZ and works to keep new development compatible with AICUZ recommended land uses. However, changes to the zoning should be monitored closely to prevent future encroachment. Additionally, the restrictive easement on the large undeveloped property located on Boca Chica Key northwest of the airfield and the lack of undeveloped land available for new development in the private sector in both Monroe County and the City of Key West also works in favor of preventing potential future encroachment.

[10] University of Florida Bureau of Economic and Business Research, 2003

7.6 Land Use Compatibility Concerns

7.6.1 Concerns to Airfield Operations

When new development proposals take place around an airfield, the proposals should be examined for incompatibilities. Incompatible development, a form of encroachment, is a concern at NAS Key West's Boca Chica Field. New development near the airfield is limited because of the lack of available land for development and existing land use ordinances. However, recent individual/incremental rezoning in the area of the 1977 AICUZ significantly increases this concern.

While pre-existing incompatible development exists around the airfield, most of this development is/was exempt (grandfathered) from Monroe County AICUZ land use regulations, for this development took place prior to recognition of the 1977 AICUZ. However, if there are proposals for re-zoning or re-development, updated AICUZ recommendations as contained in this study should be applied.

7.6.2 Concerns to the Public

The largest encroachment threat to NAS Key West is Monroe County's desire to provide affordable housing. A balance between the community's desire for growth and redevelopment and the mutual need for compatible land use within the airfield's environs protects the public's health, safety, and welfare and allows the Navy to fulfill its mission requirements is a goal shared by the Navy and the community.

8.0 Land Use Compatibility Strategies and Recommendations

The goals of the AICUZ program can most effectively be accomplished by active participation of all interested parties, including Navy, local governments, private citizens, real estate professionals, and builders/developers. Program implementation at an installation includes development of a current noise and safety analysis for the airfield, cooperation with local, state, and federal agencies, consideration of operational alternatives, enacting a complaint response program for residents in surrounding communities, and developing strategies to protect the long term viability of the airfield. This section presents tools (strategies/techniques) and recommendations for a continued successful AICUZ program at NAS Key West.

The Navy's AICUZ program is focused on promoting land use compatibility between air installations and surrounding communities. The program recognizes the local government's responsibility to protect the public health, safety, and welfare through land use control tools like zoning ordinances, building codes, subdivision regulations, building permits, and fair disclosure statements. Successful implementation of such land use controls depends on a close working relationship between the Navy and community leaders. The main activity (in this case, NAS Key West) should continually inform local governments, state governments, other federal agencies, citizens groups, and the general public on:

- Requirements of military flying;
- Airfield operations;
- Efforts to reduce noise and safety impacts; and
- Local Command's position on specific land use issues.

Although the emphasis of AICUZ program implementation is focused on areas within the AICUZ footprint, the Navy can take a position and comment on land use issues outside the footprint that might lead to incompatible development. For example, large-scale developments bordering the AICUZ footprint or new transportation or utility corridors could make the AICUZ footprint area more desirable for development. Such development could also prevent mission changes or mission expansion in the future. Therefore, Commanding Officers and their staffs should monitor proposed development beyond the AICUZ footprint, and, if needed, present those concerns in appropriate forums. Records of important discussions, negotiations, and testimony with and before local officials and boards should be maintained by the Navy.

8.1 Summary of Strategies

The following discusses tools that aid in implementing a AICUZ Program. Tools at the federal, Navy, local government, private citizen, real estate professional, and builder/developer level are available.

8.1.1 Federal Level Strategies

- **Executive Order 12372, Intergovernmental Review of Federal Programs.** As a result of the Intergovernmental Cooperation Act of 1968, the Office of Management and Budget requires, through Circular A-95, that all federal aid development projects must be coordinated with and reinforce state, regional, and local planning. As such, if land use compatibility suggestions as set forth in this AICUZ study are adopted by local government agencies, the A-95 review process can divert federal monies away from any projects that support incompatible development.
- **National Environmental Policy Act (NEPA) of 1969.** NEPA mandates full disclosure of environmental effects resulting from proposed federal actions. An environmental impact statement (EIS) disclosure provides a public open forum for review and for negotiating changes to federal actions of other agencies that would be incompatible with local AICUZ recommendations and objectives. An environmental assessment (EA) is less detailed than an EIS. The EA discusses impact and alternative measure of a proposed action, but has no public open forum for review.

8.1.2 State Level Strategies

- **State Legislation.** In 2004, the State of Florida Legislature enacted Section 163.3175, Florida Statutes, that works to promote compatible development with military installations and the exchange of information between local governments and military installations (See Appendix F). The statute found that incompatible development of land close to military installations can adversely affect the ability of such an installation to carry outs its mission. The statute also cites public safety and economic vitality as needs for the legislation. The statute states that each county in which a military installation is either wholly or partially located and each affected local government must transmit to the commanding officer of that installation information relating to proposed changes to comprehensive plans, plan amendments, and proposed changes to land development regulations which, if approved, would affect the intensity, density, or use of the land adjacent to or in close proximity to the military installation. Each county and affected local government shall provide the military installation an opportunity to review and comment on the proposed changes. Furthermore, if the installation has an airfield, they shall provide whether such proposed changes will be incompatible with the safety and noise standards contained in the AICUZ adopted by the military installation for that airfield.

8.1.3 Navy Level Strategies

- **Noise Complaint Response Program.** NAS Key West has implemented a noise complaint response program. Persons with noise complaints generated in the operational environs of NAS Key West can call the Public Affairs Office (PAO) (305) 293-2425 during normal business hours to place a complaint, or the Command Duty Office (CDO) after normal business hours at (305) 293-2268. Personnel answering the call record pertinent information such as the location, time, and description of the noise generating event. After the noise complaint is logged, it is reviewed by the PAO and often passed through to AIROPS Department where it is again reviewed, the

responsible squadron is identified, and any flight violations are identified. The PAO, or other assigned personnel may then call, or write, the individual who complained and provide an explanation as to what caused the noise.

- **Property and Property Rights Acquisition.** The acquisition of property or property rights may be exercised to achieve compatible uses in locations where other measures have failed, or are not feasible. If local governments choose not to implement land development controls within the airfield environment, or are incapable of doing so, the Navy may acquire property rights to protect its operational integrity. Acquisition may take on several forms, including easements, leaseholds, and fee simple purchase. Documentation of a community's unwillingness or inability to institute adequate controls that promote compatible land use is required in order to support acquisition projects. The first priority for acquisition is the land within the higher noise and safety impacts including Noise Zone 3 and CZ.

  Recently enacted legislation at the federal level (Title 10, United State Code [USC], Section 2684a contained in Appendix D) allows the government to enter into agreements with states, local governments, or conservation groups to prevent encroachment on military training, testing and operations. Acquisitions associated encroachment partnering with these agreements must be voluntary and are paid for out of annual appropriations.

- **Emphasis on Public Outreach** promotes close working relationships between the airfields, community leaders, and citizens. A carefully designed program of public relations and education can promote community awareness of the importance of the airfields and the Navy's desire to be a good neighbor. The Navy can use community forums, brochures, and local speaking engagements (e.g., Rotary Club) to inform the general public about the AICUZ program and the need for compatible development around the airfields. Commanding Officers and their community liaison officers should take every opportunity to meet with and make presentations to the local governments, particularly the planning and zoning agencies.

8.1.4 Local Government Strategies

The AICUZ footprint for NAS Key West affects lands in Monroe County and a small portion of the City of Key West. Currently, Monroe County zoning includes provisions for AICUZ based on the 1977 footprint. County officials have several approaches at their disposal to promote compatible land use and limit incompatibilities and conflicts within the updated AICUZ footprint including the following:

- **Zoning** is an exercise of the police powers of state and local governments that designates the uses permitted on each parcel of land. It normally consists of a zoning ordinance that delineates the various use districts and includes a zoning map based on the community's vision of the future. As this vision changes over time, the zoning can be changed to suit new ideas. Hence, for zoning to be an effective control against AICUZ-incompatible land uses, it must be monitored over time. Zoning can and should be used constructively to increase the value and productivity of land within the AICUZ footprint. Used within its limitations, zoning is the preferred method of controlling land use in AICUZ-affected areas. The limitations that must be considered when using zoning as a compatibility implementation tool include the following:

  1. Zoning is usually not retroactive. That is, changing a zone primarily for the purpose of prohibiting a use that already exists is normally not possible. However, if such zoning is

accomplished, the use must be permitted to remain as a "nonconforming" element until the owners have had ample opportunity to recoup investment.

2. Zoning is jurisdiction-limited and requires coordination of all involved jurisdictions. Zoning that implements a compatibility plan will often be composed of existing and new zoning districts within each of the zoning jurisdictions covered by the plan. Each jurisdiction is likely to have a different base zoning ordinance, with districts having different responsibilities for implementing the compatibility plan.

3. Zoning is not permanent. In any jurisdiction, zoning can be changed by the current governmental body; also, it is not bound by prior zoning actions. Consequently, zoning that achieves compatibility is subject to continual pressure for change from both urban expansion and enterprises that might profit from such changes. When these changes are proposed, the environmental impacts may require assessment. Also, from time to time, the entire zoning ordinance for a jurisdiction will be updated to accommodate increased growth or incorporate new land use concepts.

4. Zoning Board of Adjustment actions granting variances to the zoning district or exceptions written into the zoning ordinance can permit development (e.g., schools or churches) that may be incompatible.

- **Comprehensive Planning Programs** create plans for the future development or redevelopment of a community. Comprehensive plans, or policy guides for physical development and land management practices within a local jurisdiction, consist of smaller master plans relating to the various elements of a community (e.g., land use plan, transportation plan, public utilities plan, and housing plan). A comprehensive plan coordinated with the AICUZ land use objectives will reinforce the overall vision and objectives of the county, help potential developers to stay in tune with the long-airfields goals for the county, and help promote compatible uses in the areas impacted by airfield operations.

- **Subdivision Regulations** are a means by which local government can ensure that proper lot layout, design, and improvements are included in new residential developments. These regulations specifically set guidelines that developers must follow when constructing their subdivisions, including minimum requirements for road widths, lot sizes, allocation of facilities, the relationship of the subdivision to the surrounding area, and the dedication of property. Subdivision regulations are used to ensure that the health and habitability of each new residential development are maintained. All subdivision reviews should include an analysis of the potential effect the AICUZ would have on the proposed development. Modifications could then be instituted in the development plan to minimize any potentially adverse effects. All local government subdivision regulations require some type of dedication of open space to the public. This provision could be structured such that the space is located nearest the airfields, with development situated as far from the boundary as possible.

- **Building Codes** govern the construction and physical modification of structures, providing a means to control noise. Although the building codes contain requirements more specifically keyed to local construction needs, these codes also include provisions concerning administration and enforcement. Building codes could serve as an implementation mechanism strategy not only for areas within the defined AICUZ, but also for surrounding areas, which are affected by the noise levels to a lesser degree. Minimum amounts of noise suppression materials in new structures could be related to the location of the structure in relation to the noise sources. Existing structures, however, would generally not be affected by new code modifications, the need for which would depend on the level of noise and types of land uses affected. On the federal

level, incentives have been implemented to encourage home thermal insulation and the installation of solar heating units. Similar incentives could be used to encourage the installation of noise-suppression materials. To some extent, thermal building insulation measures would also assist in noise suppression. Where noise level reduction (NLR) is proposed (outdoor to indoor) through incorporation of noise attenuation features and materials, in the design and construction of the structure, certification of results by a professionally registered acoustic engineer or architect should be required.

- **Capital Improvements Programming** is the multiyear scheduling of physical upgrades to public property. A capital improvements program (CIP) is a planning tool used by local jurisdictions to phase the installation of needed public facilities (e.g., water and sewer, roads, schools) on a priority basis. A CIP projects three to six years into the future. It specifies what public improvements will be constructed. Scheduling is based on studies of fiscal resources available and improvements needed. A CIP is an important component of a growth management system. The CIP precedes preparation of a capital improvements budget (CIB). A CIB identifies the methods by which improvements will be financed and the source of the funds. Usually, development occurs where capital improvements are located. Extension of municipal services into an area makes that area more attractive to developers than sites without the improvements (i.e., the developer saves both time and money). Local governments should avoid extending capital improvements into the AICUZ impacted areas and the immediate vicinity of the footprint to avoid the possibility of incompatible uses.

- **Real Estate Fair Disclosure** can be approached as a voluntary or regulatory practice. These provisions require that developers or landowners who own property within the AICUZ area must notify any prospective purchaser of such property of the noise and safety considerations. This concept could be strengthened by having each buyer or renter execute a "disclosure statement" that contains the acknowledgment that the buyer or renter has been advised that the property is near a military installation and its location has noise or safety concerns associated with military operations conducted on the airfields. An example of one type of disclosure statement is included in Appendix E of this study.

- **Transfer of Development Rights (TDR)** involves the purchase of the property development rights and the transfer of those rights to another piece of property that has been identified by the local government as being appropriate for increased intensity land use. Thus, development of the original property can be prevented.

- **Public Purchase of Land** can work toward AICUZ objectives if the community's intention is to leave the land undeveloped or open space.

8.1.5 Private Citizens, Real Estate Professionals, and Businesses

- **Private Citizens** should consider the impact of air operations on residential property to be purchased or leased.

- **Real Estate Professionals** should be encouraged to provide written disclosure to prospective buyers, renters or lessees when property is located within an APZ or noise zone.

- **Acquisition, Development, and Construction Loan Review to Private Contractors** works to encourage a review of noise and safety hazards as part of a lender's investigation of potential

loans to private interests for real estate acquisition and development. Diligent lending practices will promote compatible development and protect lenders and developers alike. Lending institutions should consider whether to limit financing for real estate purchases or construction incompatible with AICUZ guidelines.

- **Lending institutions** that provide development and construction loans to private contractors should consider whether to limit financing for real estate purchases or construction incompatible with the AICUZ program. This strategy encourages a review of noise and APZs as part of a lender's investigation of potential loans to private interest for real-estate acquisition and development. Diligent lending practices will promote compatible development 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.

8.2 Recommendations

NAS Key West is surrounded by large areas of water, has been proactive in implementing an AICUZ program since 1977, has worked with Monroe County to promote compatible development via the adoption of AICUZ recommendations into the county's ordinance, has sought easements restricting use in critical areas of the AICUZ, and has purchased hundreds of individual lots located within the AICUZ. These steps have boded well for promoting compatible land use around NAS Key West.

8.2.1 Navy Recommended Actions

- **Designate an AICUZ Officer** who is responsible for the implementation of the updated AICUZ program for NAS Key West is recommended. The AICUZ officer should become knowledgeable of the contents of this study; property use and ownership in the vicinity of the airfield; any Navy easements surrounding the airfield; operations at the airfield; and Monroe County and the City of Key West governments, and any future development plans. Assignments of the AICUZ officer, in conjunction with the Public Affairs Office, should include monitoring the following areas as they affect the operational integrity of airfield:

    1. City and county comprehensive/development plans, updates, and amendments.
    2. Capital improvement plans and the construction of public gathering places such as new schools, churches, auditoriums.
    3. Large tract land sales.
    4. Proposed development plans, particularly near/within the AICUZ.
    5. Environmental Impact Statements.
    6. Potential implementation of an updated AICUZ in Monroe County.
    7. Update the NAS Key West Air Operations Manual to reflect this AICUZ update.

- **Maintain a community outreach program** is recommended as a specific implementation strategy in order to provide citizens with factual information regarding the noise and safety impacts of airfield operations. This program should be designed to allow individuals the opportunity to express concerns and receive explanation. The community outreach program could include the following:
    1. A multi-media presentation should be made available, designed for both technical and non-technical personnel, to be periodically presented at the Command and staff level.
    2. AICUZ seminars for public elected and appointed government officials provides the opportunity to educate those with the potential to make land use decisions. Civic leaders should be briefed on the AICUZ Study and its implications for local land development.
    3. Public presentations offer an excellent opportunity for direct communication with the community. Officers from NAS Key West should provide presentations to various community organizations including Chambers of Commerce, service clubs, community groups, property owner associations, and building trades.

8.2.2 Local Government and Agency Recommended Actions

- **Maintain good communications** between Monroe County, the City of Key West, and NAS Key West. While it is the responsibility of NAS Key West to inform and educate community decision makers about the AICUZ program, community decision makers should continue to actively inform and seek input from NAS Key West on land-use decisions that may potentially affect the operational integrity of the airfield.

- **Make land use and development decisions that support compatible land use** in the airfield environs. When reviewing proposals affecting property in proximity to the AICUZ area, the county and city recognize that:
    1. Noise contours and APZs comprising the AICUZ footprint are dynamic and there is a potential for changes in the AICUZ area, as the operational needs to satisfy the military mission change.
    2. Residents living outside the AICUZ are subject to occasional aircraft overflight and also experience noise.
    3. In reviewing development proposals in the airfield environs, local planning and zoning officials should review the specific Navy recommendations in the updated AICUZ land use categories in conjunction with the local zoning categories in their zoning ordinances and consider the application of the Navy recommendations in their land use decisions.
- **Update zoning ordinances and land use plans[1] to reflect the Navy's updated AICUZ.** Such actions will sustain the presence of the airfield and protect the health, safety, and general welfare of the public.
    1. Update AICUZ portion of zoning ordinances to reflect this study.
    2. Adopt a fair disclosure ordinance that requires real estate agents and leasers to disclose when properties are within the noise and APZ areas.

- **Review capital improvement projects** in proximity to the airfield before adoption for the potential direct and indirect impacts that such improvements may have on the ability to implement compatible development in the NAS Key West airfield environs.

8.2.3 Real Estate Professionals and Businesses Recommended Actions

- **Provide written fair disclosure** statements to prospective purchasers, renters, or leases when a property is located within the AICUZ area. Fair disclosure of property conditions to a prospective buyer is an inherent responsibility of an owner and owner's representative to disclose the condition or characteristic of the property of which the owner is aware. Disclosure of the fact that the property is located within a noise or safety area adjacent to NAS, as outlined in an AICUZ study, would help ensure that potential purchasers or renters are knowledgeable about the operation of the airport and its impact on the surrounding areas in advance, helping to reduce criticism and frustration of those who were not adequately informed of the conditions associated with the property prior to purchase or leasing.

[1] See Appendix A for City of Key West Code of Ordinances, Land Development Regulations, 1997; and Monroe County Code of Ordinances, Land Development Regulations, 1989.

A. Sections of Monroe County and City of Key West Land Use Regulation Ordinances

- Monroe County Code of Ordinances, Section 9.5, Land Development Regulations, Airport Districts.
- City of Key West Code of Ordinances, Article V, Division 9, Supplementary District Regulations.

Note: These are existing ordinances; per recommendations in Section 8, Monroe County and the City of Key West are encouraged to update these ordinances to reflect the Navy's AICUZ definition and land use compatibility recommendations (per this study).

Source: http://www.municode.com

Monroe County Code of Ordinances, Section 9.5, Land Development Regulations

Sec. 9.5-252. Airport District (AD).

(a) These districts provide classifications of property for existing or future airports and regulate uses within the boundaries of public and private airports, and uses around, adjacent, and in the approach zones of public and private airports in order to:

(1) Establish the control of obstructions and construction of structures affecting navigable airspace in accordance with criteria delineated in volume XI, part 77 in federal aviation regulations, Florida Department of Transportation regulations, and this section;

(2) Protect airports against encroachment, to implement appropriate noise abatement strategies, and to regulate development and reduce public exposure of community activities which are not compatible with airport operations;

(3) Control uses within the public and private airport property boundaries.

(b) In order to carry out the provisions of this section, there are hereby created and established a zone known as Airport District (AD) for public and military airports, and a zone known as Private Airport District (PAD) for private airports. There are hereby created and established overlay zones around and adjacent to public, private and military airports in Monroe County. Within the AD, PAD and overlay zones, certain height limitations are specified to prevent airspace obstruction, and the use limitations apply. An area located in more than one (1) zone described herein is considered to be only in the zone with the more restrictive limitations.

(c) Airport District (AD), public and military airports: The following uses are permitted as minor conditional uses in the Airport District, subject to the standards and procedures set forth in article III, division 3:

(1) Wastewater treatment facilities and wastewater treatment collection system(s) serving (a) use(s) located in any land use district provided that:

a. The wastewater treatment facility and wastewater treatment collection system(s) is (are) in compliance with all federal, state, and local requirements; and

b. The wastewater treatment facility, wastewater treatment collection system(s), and accessory uses shall be screened by structure(s) designed to:

1. Be architecturally consistent with the character of the surrounding community; and

2. Minimize the impact of any outdoor storage, temporary or permanent; and

3. A solid fence may be required upon determination by the planning director; and

c. Where a district boundary buffer is not required as set forth in article VII, division 10, a planting bed, eight (8) feet in width, shall be established to buffer the facility, with the following:

1. One (1) native canopy tree for every twenty-five (25) feet of property line; and

2. One (1) understory tree for every ten (10) feet of property line; and

3. The required trees shall be evenly distributed throughout the planting bed; and
4. The planting bed shall be installed as set forth in article VII, division 10 and maintained in perpetuity.

(2) Within the property boundaries of public airports, airport uses of less than five thousand (5,000) square feet of enclosed area shall require a minor conditional review. Airport uses of five thousand (5,000) square feet or more of enclosed space shall require a major conditional review. Within the overlay zones of public and military airports, those uses permitted shall comply with the height standards and the limitations set forth in the horizontal, conical approach, and transitional zones described in subsection (3) following.

(3) Public airport height zones and limitations for the airport district and overlays:

a. Primary zone: The area longitudinally centered on each runway with the same length as the runway and is two thousand (2,000) feet wide. No structure that is not a part of the landing and takeoff area is permitted in the primary zone that is of greater height than the nearest point on to the runway.

b. Clear zone: The area extending one thousand (1,000) feet off each end of a primary surface and is the same width as the primary surface. No structure not a part of the landing and takeoff area is permitted that is a greater height than the end of the runway.

c. Inner horizontal zone: The area extending outward from the periphery of the primary zone with an outer perimeter formed by swinging arcs of seventy-five hundred (7,500) feet radius about the center line at the end of each primary zone and connecting adjacent arcs by lines tangent to these arcs. No structure will be permitted in the inner horizontal zone of greater height than one hundred fifty-six (156) feet MSL.

d. Conical zone: The area extending outward from the periphery of the inner horizontal zone for a distance of seven thousand (7,000) feet. Height limits in the conical zone commence at one hundred fifty-six (156) feet MSL at the inner boundary where it adjoins the inner horizontal zone and increases in permitted height at a rate of one (1) foot vertically for every twenty (20) feet of horizontal distance measured outward from the inner boundary to a height of five hundred six (506) feet MSL at the outer boundary.

e. Outer horizontal zone: The area extending outward from the outer periphery of the conical zone for a distance of thirty thousand (30,000) feet. The height limit within the outer horizontal zone is five hundred six (506) feet MSL.

f. Approach zone: The area longitudinally centered on each runway extended center line, with an inner boundary two hundred (200) feet out from the end of the runway and the same width as the primary zone, then extending outward for a distance of fifty thousand (50,000) feet, expanding uniformly in width to sixteen thousand (16,000) at the outer boundary. Height limits within the approach zones commence at the height of the runway end and increase at the rate of one (1) foot vertically for every fifty (50) feet horizontallyfor a distance of twenty-five thousand (25,000) feet, at which point it remains level at five hundred six (506) feet MSL to the outer boundary.

g. Transitional zone: The area within an inner boundary formed by the side of the primary zones, the first two hundred (200) feet of the clear zones and the approach zones, then extending outward at right angles to the runway center line and extended center line until the height matches the adjoining inner horizontal zone, conical zone, and outer horizontal zone height limit. The height limit at the inner boundary is the same as the height of the adjoining zone and increases at the rate of one (1) foot vertically for every seven (7) feet horizontally to the outer boundary of the transitional zone, where it again matches the height of the adjoining zone.

(d) Private Airport District (PAD), private airport:

(1) Within the property boundary of the private airport, the following used are permitted as of right: noncommercial aircraft landing, takeoff, storage, repair, maintenance and fueling. Commercial aircraft operations, including FBO activities, may be permitted by means of a major conditional use permit. Uses within the overlay zones must comply with the height standards and the limitation set forth in paragraph (2), subparagraph b(i), (ii).

(2) Private airport height zones and limitations for airport district and overlays:

a. Private airport landing strip minimum lengths and widths:

(i) Effective landing length shall be no less than eighteen hundred (1,800) feet;

(ii) Primary surface width shall be no less than one hundred (100) feet; and

(iii) Usable width shall be no less than fifty (50) feet.

b. Private airport minimum landing approach zones:

(i) The landing approach zone for private airports is a trapezoidal area increasing gradually in width from fifty (50) feet to either side of the runway center line, at the ends of each usable runway, to a width of three hundred fifty (350) feet to either side of the runway center line at a distance of three thousand (3,000) feet outward from the ends of each runway; and

(ii) Approach zones shall be clear of obstruction above a glide path of 20:1 from the ends of each usable runway. When the approach zone to any runway crosses a road, the glide path must pass at least fifteen (15) feet above the edge of the nearest traffic lane.

c. Restrictions, private airports:

(i) No establishments or uses shall be allowed that emit smoke, gas or dust in quantities or densities sufficient to jeopardize the safe use of private airports;

(ii) No development approval or building permit shall be granted for the construction of any structure to be located within a private airport district or overlay zone which when built would constitute an airspace obstruction height that would cause a minimum obstruction altitude, a minimum descent altitude, or a decision height to be changed or a threshold to be displaced, or to interfere with the required approach glide slope; and

(iii) No property owner within the private airport district or overlay shall be permitted to grow or maintain trees to heights in excess of those provided herein for structures.

(e) The following uses are permitted as of right in the Airport District, subject to the standards and procedures set forth in article II, division 3:

(1) Collocations on existing antenna-supporting structures, pursuant to article VII, division 16, section 9.5-434.5(c) "Collocations on an existing antenna-supporting structure."

(2) Satellite earth stations, as accessory uses, pursuant to article VII, division 16, section 9.5-434.5(f) "Satellite earth stations."

(f) The following uses are permitted as minor conditional uses in the Airport District, subject to the standards and procedures set forth in article II, division 3:

(1) Attached wireless communications facilities, as accessory uses, pursuant to article VII, division 16, section 9.5-434.5(d) "Attached wireless communications facilities."

(2) Replacement of an existing antenna-supporting structure pursuant to article VII, division 16, section 9.5-434.5(b) "Replacement of an existing antenna-supporting structure."

(3) Stealth wireless communications facilities, as accessory uses, pursuant to article VII, division 16, section 9.5-434.5(e) "Stealth wireless communications facilities."

(g) Reserved.

(Ord. No. 33-1986, § 9-222; Ord. No. 19-1989, § 1(PD90A); Ord. No. 28-1999, § 2; Ord. No. 47-2000, § 3; Ord. No. 33-2001, § 3; Ord. No. 018-2002, § 16; Ord. No. 031-2003, § 1)

Editor's note: Ord. No. 028-1999, § 2, adopted July 21, 1999, set out provisions amending § 9.5-252. To maintain the alphanumeric sequence of this Code, these provisions have been included to read as herein set out. See the Code Comparative Table.

Sec. 9.5-260. AICUZ overlay.

(a) This district provides classifications of property for existing or future military airports and regulates uses around, adjacent, and in the approach zones of military airports in order to:

(1) Establish the control of obstructions and construction of structures affecting navigable airspace in accordance with criteria delineated in volume XI, part 77 in federal aviation regulations, Florida Department of Transportation regulations, and this section; and

(2) Protect military airports against encroachment, to implement appropriate noise abatement strategies, and to regulate development and reduce public exposure of community activities, which are not compatible with military airport operations.

a. Restrictions for military airports: Privately owned property adjacent to the Naval Air Station, Boca Chica, also known as NAS Key West, shall be developed in accordance with the map prepared by the U.S. Navy known as figure A* or as updated by the U.S. Navy. This map was prepared in conjunction with the United States Navy's Air Installation Compatible Use Zone Study (AICUZ). A true copy of figure A* is attached hereto and made a part of this subsection.

1. The land use objectives set forth in figure A* and the accompanying land use objectives matrix set forth in figure B* were determined by evaluating the airport operations at NAS Key West, in terms of composite noise rating (CNR) zones and accident potential zones (APZ). A copy of figure B* is attached hereto and made a part of this subsection.

2. The land use objective shown in figure A* and figure B* shall be used in determining the allowable land uses for the various AICUZ. Each land use category was evaluated in terms of compatibility for each land use in terms of density of population, density of structures, explosion hazards, air pollution height obstructions, accident potential zones, and composite noise rating zones. The evaluation resulted in ratings of:

i. No new development; and

ii. Restricted new development; and

iii. No restrictions.

3. Land use categories were rated as "restricted new development" if any activity or activities within the category were classified as incompatible. The various AICUZ are coded as follows:

i. A: Accident potential zone A (APZ-A), the most critical accident potential zone; and

ii. B3: Accident potential zone B (APZ-B), the area which has an identifiable accident potential but less than APZ-A, high noise impact, CNR zone 3; and

iii. B2: Accident potential zone B (APZ-B) the area has an identifiable accident potential but less than APZ-A, moderate noise impact, CNR zone 2; and

iv. C3: Accident potential zone C (APZ-C), the area which is less critical than APZ-B but still may possess potential for accidents; high noise impact, CNR zone 3; and

v. C2: Accident potential zone C, moderate noise impact, CNR zone 2; and

vi. C1: Accident potential zone C, low noise impact, CNR zone 1; and

vii. 3: No accident potential zone; high noise impact, CNR zone 3; and

viii. 2: No accident potential zone, moderate noise impact, CNR zone 2. (Ord. No. 031-2003, § 2)

Figure A

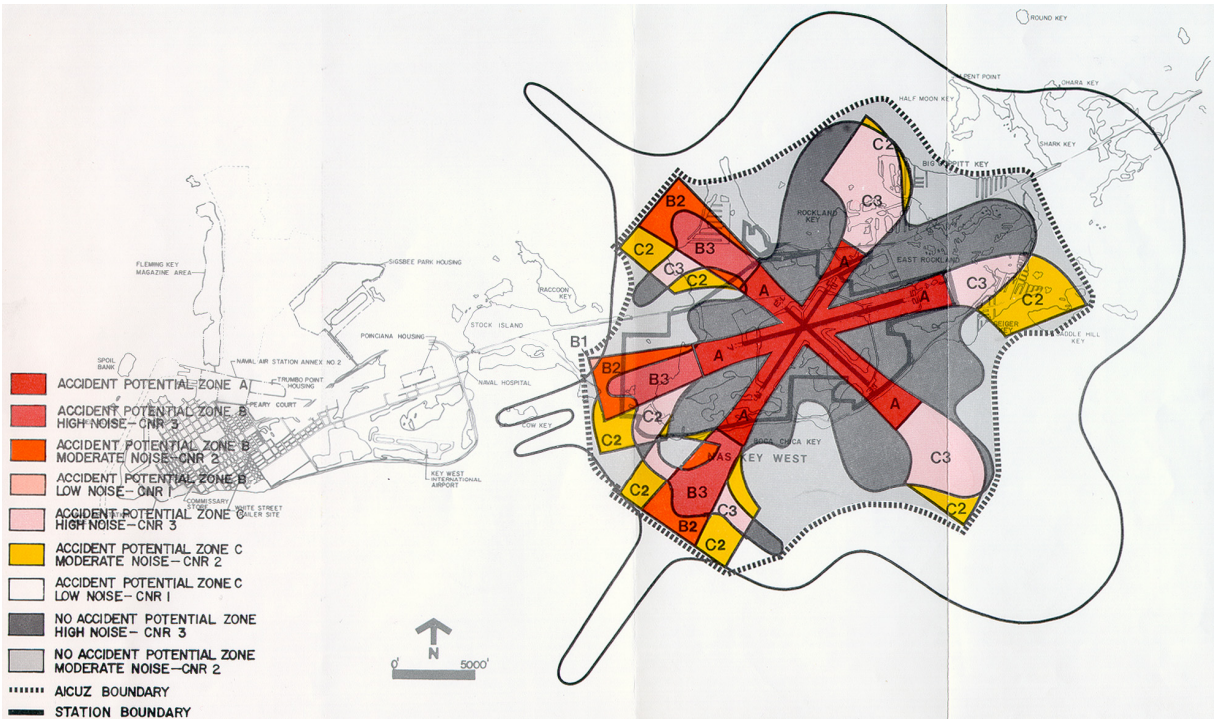
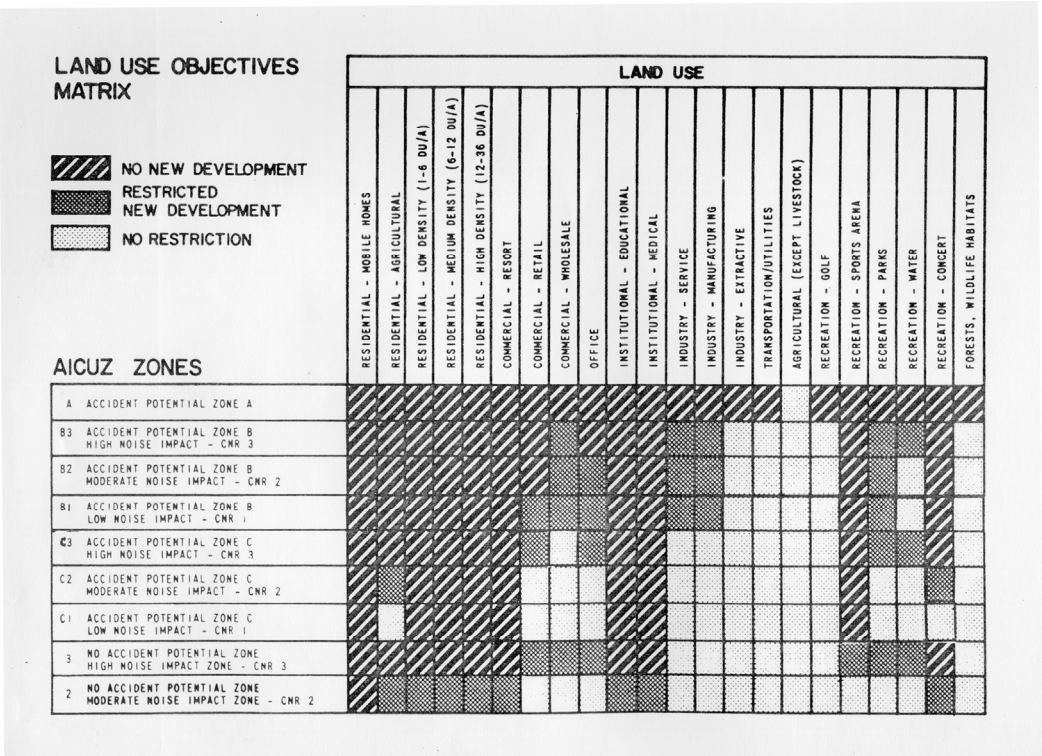


Figure B



City of Key West Code of Ordinances, Land Development Regulations, Article VII, General Regulations

DIVISION 9. AIRPORT RESTRICTIONS

Sec. 122-1436. Airport height limitations.

No structure shall be erected within the approach zones of an active runway on the Key West International Airport with a height in excess of those permitted by the Federal Aviation Administration or by the city commission. All structures shall comply with the city comprehensive plan and this division.
(Ord. No. 97-10, § 1(2-7.23), 7-3-1997)

Sec. 122-1437. Definitions.

The following words, terms and phrases, when used in this division, shall have the meanings ascribed to them in this section, except where the context clearly indicates a different meaning:

Airport means Key West International Airport.

Airport elevation means the highest point of the airport's usable landing area measured in feet above sea level.

Airport hazard means any structure, street, or use of land which would exceed the federal obstruction standards as contained in 14 CFR 77.21, 77.23, 77.25 and 77.28, revised March 4, 1972, or which obstructs the airspace required for landing or takeoff at the airport or which is otherwise hazardous to the flight of aircraft.

Control zone means airspace extending upward from the surface of the earth which may include one or more airports and which is normally a circular area of five statute miles in radius, with extension where necessary to include instrument approach and departure paths.

Decision height means the height at which decision must be made, during an instrument landing system (ILS) approach, to either continue the approach or to execute a missed approach.

Height. For the purpose of determining the height limits in all zones set forth in this division, the datum shall be mean sea level elevation unless otherwise specified.

Instrument runway means a runway having an existing or planned instrument procedure utilizing air navigation facilities or area-type navigation equipment.

Landing area means the area of the airport used for the landing, takeoff, or taxing of aircraft.

Minimum descent altitude means the lowest altitude, expressed in feet above mean sea level, to which descent is authorized on final approach or during circle-to-land maneuvering in execution of a standard instrument approach procedure, where no electronic glide slope is provided.

Minimum en route altitude means the altitude in effect between radio fixes which ensures acceptable navigational signal coverage and meets obstruction clearance requirements between those fixes.

Minimum obstruction clearance altitude means the specified altitude in effect between radio fixes on visual omnirange (VOR) airways, off-airway routes, or route segments which meet obstruction clearance requirements for the entire route segment and which ensures acceptable navigational signal coverage only within 22 miles of a VOR.

Runway means the defined area of an airport prepared for aircraft landing/takeoff along its length.

Visual runway means any runway other than an instrument runway.

Zoning administrator means the administrative office or agency responsible for administering land development regulations within the city.
(Ord. No. 97-10, § 1(2-7.23(A)), 7-3-1997)
Cross references: Definitions generally, § 1-2.

Sec. 122-1438. Airport zones and airport height limitations.

In order to carry out this division, there are created and established certain zones which are depicted on the airport height restriction zoning maps on file in the city clerk's office, Zoning Map A, Key West International and NAS Key West. An area located in more than one zone of the described zones is considered to be only in the zone with the more restrictive height limitation. The various public civil airport height zones and limitations are established and defined as follows:

(1) Primary zone. The area longitudinally centered on a runway, extending 200 feet beyond each end of that runway with the width so specified for each runway for the most precise approach existing or planned for either end of the runway. No structure will be permitted within the primary zone that is not part of the landing and takeoff area that is a greater height than the nearest point on the runway centerline. The width of the primary zone for runway 09/27 at Key West International is 500 feet.

(2) Horizontal zone. The area encompassing the runways, primary zone, approach zones and transitional zone of each airport with the boundary formed by swinging arcs of specified radii from the center of each end of the primary zone of each runway and connecting adjacent arcs by lines tangent to those arcs. The radius specified for Key West International is 10,000 feet. No structure will be permitted in the horizontal zone that is higher than 150 feet above the established airport elevation.

(3) Conical zone. The area extending outward and upward from the periphery of the horizontal zone for a distance of 4,000 feet. Height limitations for structures in the conical zone are 150 feet above airport elevation at the inner boundary of the zone with permitted height increasing one foot vertically for every 20 feet of horizontal distance measured outward from the inner boundary of the zone to a height of 350 feet above airport elevation at the outer boundary of the zone.

(4) Approach zone. The area longitudinally centered on the extended runway centerline and proceeding outward from each end of the primary surface for a specified distance as follows: Key West International runway 9, 5,000 feet and runway 27, 10,000 feet. The width of that approach zone is the same at the inner boundary as the primary zone it adjoins and expands uniformly to a width at the outer boundary as follows: Key West International runway 9, 1,500 feet and runway 27, 3,500 feet. Permitted height limitations within theapproach zones for runway 9 at Key West International are the same as the height of the runway end at the inner boundary and increase at the rate of one foot vertically for every 20 feet horizontal distance. Permitted height limitations within the approach zone for runway 27 at Key West International are the same as the runway end at the inner boundary and increase one foot vertically for every 34 feet horizontally.

(5) Transitional zone. The area extending outward from the sides of the primary zones and approach zones connecting them to the horizontal zone. Height limits within the transitional zone are the same as the primary zone or approach zone at the boundary line where it adjoins and increases at a rate of one foot vertically for every seven feet horizontally, with the horizontal distance measured at right angles to the runway centerline and extended centerline, until the height matches the height of the horizontal zone, which formsthe outer boundary.

(6) Other zones. In addition to the height limitations imposed in subsections (1) through (5) of this section, no structure will be permitted that exceeds 500 feet above airport elevation within ten nautical miles of the Key West International Airport, and no structure will be permitted within the city that would cause a minimum obstruction clearance altitude, a minimum descent altitude or a decision height to be raised.
(Ord. No. 97-10, § 1(2-7.23(B)), 7-3-1997)

Sec. 122-1439. Airport land use restrictions.

(a) Notwithstanding any other section of this division, no use may be made of land or water within the city in such a manner as to interfere with the operation of an airborne aircraft. The following special requirement shall apply to each permitted use:

(1) All lights or illumination used in conjunction with street, parking, signs, or use of land and structures shall be arranged and operated in such a manner that it is not misleading or dangerous to aircraft operating from a public airport or in the vicinity thereof.

(2) No operations from any use shall produce smoke, glare or other visual hazards within three statute miles of any usable runway of a public airport.

(3) No operations from any use in the city shall produce electronic interference with navigation signals or radio communication between an airport and an aircraft.

(b) Notwithstanding sections 122-1436 through 122-1438 and subsection (a) of this section, the owner of any structure over 200 feet above ground level must install on that structure lighting in accordance with Federal Aviation Administration Advisory Circular 70-7460-ID and any amendments thereto. Additionally, any structure exceeding 749 feet above mean sea level must install on that structure high intensity white obstruction lights. The high intensity white obstruction lights must be in accordance with Federal Aviation Administration Advisory Circular 70-7460-ID and any amendments thereto.

(c) Any permit or variance granted may be so conditioned as to require the owner of the structure or growth in question to permit the city at its own expense to install, operate, and maintain thereto such markers and lights as may be necessary to indicate to pilots the presence of an airspace hazard.

(Ord. No. 97-10, § 1(2-7.23(C)), 7-3-1997)

Sec. 122-1440. Administration.

It shall be the duty of the zoning administrator to administer and enforce this division within the territorial limits over which the political subdivision the administrator represents has zoning authority. For any violation of this division, the person responsible for such violation shall be given notice in writing by the zoning administrator. Such notice shall indicate the nature of the violation and the necessary action to correct or abate the violation. A copy of such notice shall be sent to the city board of adjustment. An administrative official shall order discontinuance of use of the land or building; removal of trees to conform with height limitations set forth in this division; removal of buildings, additions, alterations or structures; discontinuance of any work being done; or shall take any or all other actions necessary to correct violations and obtain compliance with all the sections of this division.

(Ord. No. 97-10, § 1(2-7.23(D)), 7-3-1997)
Secs. 122-1441--122-1464. Reserved.

B. Real Estate Easements on Boca Chica Key

275454

OFF REC 856 PG 1529

EASEMENT DEED

KNOW ALL MEN BY THESE PRESENTS:

THAT L. E. Davis of

Longwood, Florida

, hereinafter called the Grantor, for and in consideration of the sum of One Dollar ($1.00), the receipt and sufficiency of which is hereby acknowledged, has granted, bargained, sold and conveyed and by these presents does grant, bargain, sell and convey unto the United States of America and its assigns, hereinafter called the Government, an easement in perpetuity for the establishment, maintenance, operation and use of a compatible use zone in connection with the operation of the Naval Air Station, Key West, Florida in, upon, over and across that parcel of land situate in Monroe County, Florida, hereinafter called the Premises, more particularly described as follows:

DS Paid 454 Date 6-22-82
MONROE COUNTY
RALPH WHITE, CLERK OF CIR. CT.,
By Maria Bethel D.C.

A parcel of land lying and being in the County of Monroe, State of Florida, as recorded in Official Records Book 93 at Page 407 of the Public Boards of Monroe County, Florida, being more particularly described as follows:

All of Government Lots 2 and 3 of Section 19, Township 67 South, Range 26 East, Monroe County, Florida;

Containing 122.75 acres more or less.

BY THIS GRANT OF EASEMENT the Grantor, for itself, (its heirs, successors, and assigns, as appropriate) covenants, as a covenant running with the Premises, that:

1. It will not use or permit use of the premises for the construction of dwellings or habitable facilities or for any purpose that is not included in the following list of Compatible Land Uses:

Food and Kindred Product Manufacturing
Textile Mill Products Manufacturing
Apparel and other finished products made from Fabrics, Leather and Simulated Materials Manufacturing
Lumber and Wood products Manufacturing
Furniture and Fixtures Manufacturing
Paper and Allied Products Manufacturing
Printing and Publishing Industry
Chemicals and Allied Products Manufacturing
Rubber and Miscellaneous Plastic Products Manufacturing
Stone, Clay and Glass Products Manufacturing
Primary Metal Industries
Fabricated Metal Product Manufacturing
Railroad and Rapid Rail Transit
Motor Vehicle Transportation
Marine Craft Transportation
Highway and Street Right of Way
Automobile Parking
Transportation and Utilities
Agricultural and Agricultural Related Activities
Forestry Activities and Related Services
Fishing Activities and Related Services

'82 JUN 22 P3:55

Mining Activities and Related Services
Noncommercial Forest Development
Wholesale Trade
Retail Trade of Building Materials, General Merchandise, Goods, Autos, Marine, Aircraft, Apparel and Accessories, Furniture, Home Furnishings and Equipment, Eating and Drinking
Finance, Insurance & Real Estate Services
Personal Services
Business Services
Repair Services
Professional Services
Contract Construction Services
Outdoor Amusements
Sports Activities
Water Based Activities
Playgrounds and Neighborhood Parks
Community Parks

2. No man made or natural obstructions, including structures and trees, shall be constructed or permitted to grow so as to extend more than 116 feet above mean sea level and any such obstructions which extend above 116 feet above mean sea level shall be altered, trimmed, cut or otherwise removed by the Grantor. Provided, however, if the Grantor should fail to do so, the Government may in behalf of and at the expense of the Grantor effect such removal by the use of the Government forces or by contract, and in doing so shall have the right to salvage, sell, dispose of, or abandon in place any and all of the man made or natural obstructions so removed without liability to the Government.

3. All buildings on the premises will be designed, constructed, and equipped to reduce the noise level in the interior of the building 25 db below the external noise levels during aircraft operations.

4. The Government shall have the right of ingress and egress to, from and across the Premises at reasonable times and upon reasonable notice, to determine and insure compliance with the above covenant.

5. The easement herein granted is subject to all existing easements and rights of way for public roads and highways, public utilities, railroads and pipelines.

6. The Grantor reserves to itself, (its heirs, successors and assigns, as appropriate) all such rights and privileges in the Premises that do not interfere with, limit, or abridge the rights granted the Government and its assigns, hereunder, specifically reserving to the Grantor (its heirs, successors and assigns, as appropriate) the right and privilege to use, construct upon, and develop the Premises for those purposes, and those purposes only, which are specified in paragraph 1. above and within the height restrictions as set forth in paragraph 2. above.

This easement is granted subject to the condition that this easement shall cease and be terminated upon the written determination by the Government that it is no longer required for Government purposes.

IN WITNESS WHEREOF, the Grantor has caused this Easement Deed to be duly executed this 26th day of March, 1982

WITNESS:

Suzy Sowinski

Christine Cantrell

GRANTOR

Lyman Eugene Davis

STATE OF Florida)
COUNTY OF Seminole)

PERSONALLY appeared before me LYMAN Eugene DAVIS and made oath that he/she saw the within named LYMAN EUGENE DAVIS, sign, seal, and as their act and deed deliver the within written Easement and that he/she along with SUZY SOWINSKY witnessed the execution thereof.

Christine Cantrell

SWORN TO before me this

26th day of March, 1982

Christine Cantrell
Notary Public

My Commission Expires: Notary Public, State of Florida at Large My Commission Expires February 12, 1984

This instrument was prepared by
Kelly S. Hodge, Assistant Counsel
for the Southern Division, Naval
Facilitis Engineering Command,
P.O. Box 10068, Charleston, S.C. 29411

MAR 2 3 19

OFF REC 856 PG 1532

275155

EASEMENT DEED

KNOW ALL MEN BY THESE PRESENTS:

THAT Charleston Capital Corporation, by Henry Yaschik, President of _____

Charleston, South Carolina

_____, hereinafter called the Grantor, for and in consideration of the sum of One Dollar ($1.00), the receipt and sufficiency of which is hereby acknowledged, has granted, bargained, sold and conveyed and by these presents does grant, bargain, sell and convey unto the United States of America and its assigns, hereinafter called the Government, an easement in perpetuity for the establishment, maintenance, operation and use of a compatible use zone in connection with the operation of the Naval Air Station, Key West, Florida in, upon, over and across that parcel of land situate in Monroe County, Florida, hereinafter called the Premises, more particularly described as follows:

DS Paid 45.00 Date 6-22-82
MONROE COUNTY
RALPH WHITE, CLERK OF CIR. CT.,
By Marie Bethel D.C.

A parcel of land lying and being in the County of Monroe, State of Florida, as recorded in Official Records Book 93 at Page 407 of the Public Boards of Monroe County, Florida, being more particularly described as follows:

All of Government Lots 2 and 3 of Section 19, Township 67 South, Range 26 East, Monroe County, Florida;

Containing 122.75 acres more or less.

BY THIS GRANT OF EASEMENT the Grantor, for itself, (its heirs, successors, and assigns, as appropriate) covenants, as a covenant running with the Premises, that:

1. It will not use or permit use of the premises for the construction of dwellings or habitable facilities or for any purpose that is not included in the following list of Compatible Land Uses:

'82 JUN 22 P3:55

Food and Kindred Product Manufacturing
Textile Mill Products Manufacturing
Apparel and other finished products made from Fabrics, Leather and Simulated Materials Manufacturing
Lumber and Wood products Manufacturing
Furniture and Fixtures Manufacturing
Paper and Allied Products Manufacturing
Printing and Publishing Industry
Chemicals and Allied Products Manufacturing
Rubber and Miscellaneous Plastic Products Manufacturing
Stone, Clay and Glass Products Manufacturing
Primary Metal Industries
Fabricated Metal Product Manufacturing
Railroad and Rapid Rail Transit
Motor Vehicle Transportation
Marine Craft Transportation
Highway and Street Right of Way
Automobile Parking
Transportation and Utilities
Agricultural and Agricultural Related Activities
Forestry Activities and Related Services
Fishing Activities and Related Services

Mining Activities and Related Services
Noncommercial Forest Development
Wholesale Trade
Retail Trade of Building Materials, General Merchandise, Goods, Autos, Marine, Aircraft, Apparel and Accessories, Furniture, Home Furnishings and Equipment, Eating and Drinking
Finance, Insurance & Real Estate Services
Personal Services
Business Services
Repair Services
Professional Services
Contract Construction Services
Outdoor Amusements
Sports Activities
Water Based Activities
Playgrounds and Neighborhood Parks
Community Parks

2. No man made or natural obstructions, including structures and trees, shall be constructed or permitted to grow so as to extend more than 116 feet above mean sea level and any such obstructions which extend above 116 feet above mean sea level shall be altered, trimmed, cut or otherwise removed by the Grantor. Provided, however, if the Grantor should fail to do so, the Government may in behalf of and at the expense of the Grantor effect such removal by the use of the Government forces or by contract, and in doing so shall have the right to salvage, sell, dispose of, or abandon in place any and all of the man made or natural obstructions so removed without liability to the Government.

3. All buildings on the premises will be designed, constructed, and equipped to reduce the noise level in the interior of the building 25 db below the external noise levels during aircraft operations.

4. The Government shall have the right of ingress and egress to, from and across the Premises at reasonable times and upon reasonable notice, to determine and insure compliance with the above covenant.

5. The easement herein granted is subject to all existing easements and rights of way for public roads and highways, public utilities, railroads and pipelines.

6. The Grantor reserves to itself, (its heirs, successors and assigns, as appropriate) all such rights and privileges in the Premises that do not interfere with, limit, or abridge the rights granted the Government and its assigns, hereunder, specifically reserving to the Grantor (its heirs, successors and assigns, as appropriate) the right and privilege to use, construct upon, and develop the Premises for those purposes, and those purposes only, which are specified in paragraph 1. above and within the height restrictions as set forth in paragraph 2. above.

This easement is granted subject to the condition that this easement shall cease and be terminated upon the written determination by the Government that it is no longer required for Government purposes.

IN WITNESS WHEREOF, the Grantor has caused this Easement Deed to be duly executed this 30th day of March, 1982

WITNESS:

Nancy Schnebelen

Mary Harman

GRANTOR

Henry Yaschik

President, Charleston Capital Corp.

STATE OF South Carolina)
)
COUNTY OF Charleston)

PERSONALLY appeared before me Nancy Schnebelen and made oath that ~~he~~/she saw the within named Henry Yaschik, President of Charleston Capital Corp., sign, seal, and as their act and deed deliver the within written Easement and that he/she along with Mary Harman witnessed the execution thereof.

Nancy Schnebelen

SWORN TO before me this

30 day of March, 1982

Mary Harman

Notary Public

MY COMMISSION EXPIRES MAY 27, 1990.

My Commission Expires: _____

RECORDED IN OFFICIAL RECORDS BOOK OF MONROE COUNTY, FLORIDA.
RECORD VERIFIED
RALPH W. WHITE
CLERK CIRCUIT COURT

This instrument was prepared by
Kelly S. Hodge, Assistant Counsel
for the Southern Division, Naval
Facilities Engineering Command,
P.O. Box 10068, Charleston, S.C. 29411

OFF REC. 856 PG 1535

EASEMENT DEED

KNOW ALL MEN BY THESE PRESENTS:

275456 THAT Edward D. Soady of

Jacksonville, Florida

, hereinafter called the Grantor, for and in consideration of the sum of One Dollar ($1.00), the receipt and sufficiency of which is hereby acknowledged, has granted, bargained, sold and conveyed and by these presents does grant, bargain, sell and convey unto the United States of America and its assigns, hereinafter called the Government, an easement in perpetuity for the establishment, maintenance, operation and use of a compatible use zone in connection with the operation of the Naval Air Station, Key West, Florida in, upon, over and across that parcel of land situate in Monroe County, Florida, hereinafter called the Premises, more particularly described as follows:

DS Paid 454 Date 6-22-82
MONROE COUNTY
RALPH WHITE, CLERK OF CIR. CT.
By Marie Bethel D.C.

A parcel of land lying and being in the County of Monroe, State of Florida, as recorded in Official Records Book 93 at Page 407 of the Public Boards of Monroe County, Florida, being more particularly described as follows:

All of Government Lots 2 and 3 of Section 19, Township 67 South, Range 26 East, Monroe County, Florida;

Containing 122.75 acres more or less.

BY THIS GRANT OF EASEMENT the Grantor, for itself, (its heirs, successors, and assigns, as appropriate) covenants, as a covenant running with the Premises, that:

1. It will not use or permit use of the premises for the construction of dwellings or habitable facilities or for any purpose that is not included in the following list of Compatible Land Uses:

Food and Kindred Product Manufacturing
Textile Mill Products Manufacturing
Apparel and other finished products made from Fabrics, Leather and Simulated Materials Manufacturing
Lumber and Wood products Manufacturing
Furniture and Fixtures Manufacturing
Paper and Allied Products Manufacturing
Printing and Publishing Industry
Chemicals and Allied Products Manufacturing
Rubber and Miscellaneous Plastic Products Manufacturing
Stone, Clay and Glass Products Manufacturing
Primary Metal Industries
Fabricated Metal Product Manufacturing
Railroad and Rapid Rail Transit
Motor Vehicle Transportation
Marine Craft Transportation
Highway and Street Right of Way
Automobile Parking
Transportation and Utilities
Agricultural and Agricultural Related Activities
Forestry Activities and Related Services
Fishing Activities and Related Services

'82 JUN 22 P3:55

Mining Activities and Related Services
Noncommercial Forest Development
Wholesale Trade
Retail Trade of Building Materials, General Merchandise, Goods, Autos, Marine, Aircraft, Apparel and Accessories, Furniture, Home Furnishings and Equipment, Eating and Drinking
Finance, Insurance & Real Estate Services
Personal Services
Business Services
Repair Services
Professional Services
Contract Construction Services
Outdoor Amusements
Sports Activities
Water Based Activities
Playgrounds and Neighborhood Parks
Community Parks

2. No man made or natural obstructions, including structures and trees, shall be constructed or permitted to grow so as to extend more than 116 feet above mean sea level and any such obstructions which extend above 116 feet above mean sea level shall be altered, trimmed, cut or otherwise removed by the Grantor. Provided, however, if the Grantor should fail to do so, the Government may in behalf of and at the expense of the Grantor effect such removal by the use of the Government forces or by contract, and in doing so shall have the right to salvage, sell, dispose of, or abandon in place any and all of the man made or natural obstructions so removed without liability to the Government.

3. All buildings on the premises will be designed, constructed, and equipped to reduce the noise level in the interior of the building 25 db below the external noise levels during aircraft operations.

4. The Government shall have the right of ingress and egress to, from and across the Premises at reasonable times and upon reasonable notice, to determine and insure compliance with the above covenant.

5. The easement herein granted is subject to all existing easements and rights of way for public roads and highways, public utilities, railroads and pipelines.

6. The Grantor reserves to itself, (its heirs, successors and assigns, as appropriate) all such rights and privileges in the Premises that do not interfere with, limit, or abridge the rights granted the Government and its assigns, hereunder, specifically reserving to the Grantor (its heirs, successors and assigns, as appropriate) the right and privilege to use, construct upon, and develop the Premises for those purposes, and those purposes only, which are specified in paragraph 1. above and within the height restrictions as set forth in paragraph 2. above.

This easement is granted subject to the condition that this easement shall cease and be terminated upon the written determination by the Government that it is no longer required for Government purposes.

IN WITNESS WHEREOF, the Grantor has caused this Easement Deed to be duly executed this 9th day of April, 1982

WITNESS: GRANTOR

STATE OF Florida)
COUNTY OF Duval)

PERSONALLY appeared before me Marilyn Crown and made oath that he/she saw the within named Edward D. Leady __________, sign, seal, and as their act and deed deliver the within written Easement and that he/she along with Patrick R. Lendon __________ witnessed the execution thereof.

Marilyn I Crown

SWORN TO before me this

9th day of April, 1982

Marilyn J. Evans
Notary Public

My Commission Expires: NOTARY PUBLIC STATE OF FLORIDA AT LARGE MY COMMISSION EXPIRES FEB. 11 1983 BONDED THRU GENERAL INS. UNDERWRITERS

RECORDED IN OFFICIAL RECORDS BOOK OF DUVAL COUNTY, FLORIDA. RECORD VERIFIED
RALPH W. WHITE
CLERK CIRCUIT COURT

This instrument was prepared by
Kelly S. Hodge, Assistant Counsel
for the Southern Division, Naval
Facilities Engineering Command,
P.O. Box 10068, Charleston, S.C. 29411

EASEMENT DEED

KNOW ALL MEN BY THESE PRESENTS:
THAT Landmark First National Bank of Fort Lauderdale, as Trustee-of-Ruth B. Hodges Marital Trust U/W of Fort Lauderdale, Florida, hereinafter called the Grantor, for and in consideration of the sum of One Dollar ($1.00), the receipt and sufficiency of which is hereby acknowledged, has granted, bargained, sold and conveyed and by these presents does grant, bargain, sell and convey unto the United States of America and its assigns, hereinafter called the Government, an easement in perpetuity for the establishment, maintenance, operation and use of a compatible use zone in connection with the operation of the Naval Air Station, Key West, Florida in, upon, over and across that parcel of land situate in Monroe County, Florida, hereinafter called the Premises, more particularly described as follows:

A parcel of land lying and being in the County of Monroe, State of Florida, as recorded in Official Records Book 93 at Page 407 of the Public Boards of Monroe County, Florida, being more particularly described as follows:

All of Government Lots 2 and 3 of Section 19, Township 67 South, Range 26 East, Monroe County, Florida;

Containing 122.75 acres more or less.

DS Paid 45¢ Date 6-22-82
MONROE COUNTY
RALPH WHITE, CLERK OF CIR. CT.
By Marie Bethel D.C.

BY THIS GRANT OF EASEMENT the Grantor, for itself, (its heirs, successors, and assigns, as appropriate) covenants, as a covenant running with the Premises, that:

1. It will not use or permit use of the premises for the construction of dwellings or habitable facilities or for any purpose that is not included in the following list of Compatible Land Uses:

Food and Kindred Product Manufacturing
Textile Mill Products Manufacturing
Apparel and other finished products made from Fabrics, Leather and Simulated Materials Manufacturing
Lumber and Wood products Manufacturing
Furniture and Fixtures Manufacturing
Paper and Allied Products Manufacturing
Printing and Publishing Industry
Chemicals and Allied Products Manufacturing
Rubber and Miscellaneous Plastic Products Manufacturing
Stone, Clay and Glass Products Manufacturing
Primary Metal Industries
Fabricated Metal Product Manufacturing
Railroad and Rapid Rail Transit
Motor Vehicle Transportation
Marine Craft Transportation
Highway and Street Right of Way
Automobile Parking
Transportation and Utilities
Agricultural and Agricultural Related Activities
Forestry Activities and Related Services
Fishing Activities and Related Services

'82 JUN 22 P3:55

Mining Activities and Related Services
Noncommercial Forest Development
Wholesale Trade
Retail Trade of Building Materials, General Merchandise, Goods, Autos, Marine, Aircraft, Apparel and Accessories, Furniture, Home Furnishings and Equipment, Eating and Drinking
Finance, Insurance & Real Estate Services
Personal Services
Business Services
Repair Services
Professional Services
Contract Construction Services
Outdoor Amusements
Sports Activities
Water Based Activities
Playgrounds and Neighborhood Parks
Community Parks

2. No man made or natural obstructions, including structures and trees, shall be constructed or permitted to grow so as to extend more than 116 feet above mean sea level and any such obstructions which extend above 116 feet above mean sea level shall be altered, trimmed, cut or otherwise removed by the Grantor. Provided, however, if the Grantor should fail to do so, the Government may in behalf of and at the expense of the Grantor effect such removal by the use of the Government forces or by contract, and in doing so shall have the right to salvage, sell, dispose of, or abandon in place any and all of the man made or natural obstructions so removed without liability to the Government.

3. All buildings on the premises will be designed, constructed, and equipped to reduce the noise level in the interior of the building 25 db below the external noise levels during aircraft operations.

4. The Government shall have the right of ingress and egress to, from and across the Premises at reasonable times and upon reasonable notice, to determine and insure compliance with the above covenant.

5. The easement herein granted is subject to all existing easements and rights of way for public roads and highways, public utilities, railroads and pipelines.

6. The Grantor reserves to itself, (its heirs, successors and assigns, as appropriate) all such rights and privileges in the Premises that do not interfere with, limit, or abridge the rights granted the Government and its assigns, hereunder, specifically reserving to the Grantor (its heirs, successors and assigns, as appropriate) the right and privilege to use, construct upon, and develop the Premises for those purposes, and those purposes only, which are specified in paragraph 1. above and within the height restrictions as set forth in paragraph 2. above.

This easement is granted subject to the condition that this easement shall cease and be terminated upon the written determination by the Government that it is no longer required for Government purposes.

IN WITNESS WHEREOF, the Grantor has caused this Easement Deed to be duly executed this 26th day of March, 1982

WITNESS:

Bonnie J. Sorrentino

Louise Shaffer

GRANTOR

Robert Schneider Vice Pres. & Trust Officer

STATE OF FLORIDA)
)
COUNTY OF BROWARD)

PERSONALLY appeared before me Bonnie J. Sorrentino and made oath that he/she saw the within named Robert Schneider Vice Pres. & Trust Officer, sign, seal, and as their act and deed deliver the within written Easement and that he/she along with Louise Shaffer witnessed the execution thereof.

Jadwiga I. Sworak

SWORN TO before me this

26 day of March, 1982

Notary Public, State of Florida at Large
My Commission Expires Sept. 4, 1984
Bonded thru Troy Fain ... Insurance, Inc.

Notary Public

My Commission Expires: _____

RECORDED IN OFFICIAL RECORDS BOOK
OF MONROE COUNTY, FLORIDA.
RECORD VERIFIED
RALPH W. WHITE
CLERK CIRCUIT COURT

This instrument was prepared by
Kelly S. Hodge, Assistant Counsel
for the Southern Division, Naval
Facilities Engineering Command,
P.O. Box 10068, Charleston, S.C. 29411

EASEMENT DEED

KNOW ALL MEN BY THESE PRESENTS:

THAT D. W. Smoak of Fort Lauderdale, Florida, hereinafter called the Grantor, for and in consideration of the sum of One Dollar ($1.00), the receipt and sufficiency of which is hereby acknowledged, has granted, bargained, sold and conveyed and by these presents does grant, bargain, sell and convey unto the United States of America and its assigns, hereinafter called the Government, an easement in perpetuity for the establishment, maintenance, operation and use of a compatible use zone in connection with the operation of the Naval Air Station, Key West, Florida in, upon, over and across that parcel of land situate in Monroe County, Florida, hereinafter called the Premises, more particularly described as follows:

A parcel of land lying and being in the County of Monroe, State of Florida, as recorded in Official Records Book 93 at Page 407 of the Public Boards of Monroe County, Florida, being more particularly described as follows:

All of Government Lots 2 and 3 of Section 19, Township 67 South, Range 26 East, Monroe County, Florida;

Containing 122.75 acres more or less.

DS Paid 454 Date 6-22-82
MONROE COUNTY
RALPH WHITE, CLERK OF CIR. CT.,
By Marie Bertel D.C.

BY THIS GRANT OF EASEMENT the Grantor, for itself, (its heirs, successors, and assigns, as appropriate) covenants, as a covenant running with the Premises, that:

1. It will not use or permit use of the premises for the construction of dwellings or habitable facilities or for any purpose that is not included in the following list of Compatible Land Uses:

Food and Kindred Product Manufacturing
Textile Mill Products Manufacturing
Apparel and other finished products made from Fabrics, Leather and Simulated Materials Manufacturing
Lumber and Wood products Manufacturing
Furniture and Fixtures Manufacturing
Paper and Allied Products Manufacturing
Printing and Publishing Industry
Chemicals and Allied Products Manufacturing
Rubber and Miscellaneous Plastic Products Manufacturing
Stone, Clay and Glass Products Manufacturing
Primary Metal Industries
Fabricated Metal Product Manufacturing
Railroad and Rapid Rail Transit
Motor Vehicle Transportation
Marine Craft Transportation
Highway and Street Right of Way
Automobile Parking
Transportation and Utilities
Agricultural and Agricultural Related Activities
Forestry Activities and Related Services
Fishing Activities and Related Services

'82 JUN 22 P3:55

Mining Activities and Related Services
Noncommercial Forest Development
Wholesale Trade
Retail Trade of Building Materials, General Merchandise, Goods, Autos, Marine, Aircraft, Apparel and Accessories, Furniture, Home Furnishings and Equipment, Eating and Drinking
Finance, Insurance & Real Estate Services
Personal Services
Business Services
Repair Services
Professional Services
Contract Construction Services
Outdoor Amusements
Sports Activities
Water Based Activities
Playgrounds and Neighborhood Parks
Community Parks

2. No man made or natural obstructions, including structures and trees, shall be constructed or permitted to grow so as to extend more than 116 feet above mean sea level and any such obstructions which extend above 116 feet above mean sea level shall be altered, trimmed, cut or otherwise removed by the Grantor. Provided, however, if the Grantor should fail to do so, the Government may in behalf of and at the expense of the Grantor effect such removal by the use of the Government forces or by contract, and in doing so shall have the right to salvage, sell, dispose of, or abandon in place any and all of the man made or natural obstructions so removed without liability to the Government.

3. All buildings on the premises will be designed, constructed, and equipped to reduce the noise level in the interior of the building 25 db below the external noise levels during aircraft operations.

4. The Government shall have the right of ingress and egress to, from and across the Premises at reasonable times and upon reasonable notice, to determine and insure compliance with the above covenant.

5. The easement herein granted is subject to all existing easements and rights of way for public roads and highways, public utilities, railroads and pipelines.

6. The Grantor reserves to itself, (its heirs, successors and assigns, as appropriate) all such rights and privileges in the Premises that do not interfere with, limit, or abridge the rights granted the Government and its assigns, hereunder, specifically reserving to the Grantor (its heirs, successors and assigns, as appropriate) the right and privilege to use, construct upon, and develop the Premises for those purposes, and those purposes only, which are specified in paragraph 1. above and within the height restrictions as set forth in paragraph 2. above.

This easement is granted subject to the condition that this easement shall cease and be terminated upon the written determination by the Government that it is no longer required for Government purposes.

IN WITNESS WHEREOF, the Grantor has caused this Easement Deed to be duly executed this 26 day of March, 1982

WITNESS:

X Barbara Sawyer

X Kathryn Gilbody

GRANTOR

X D W Smoak

STATE OF FLORIDA)
)
COUNTY OF BROWARD)

PERSONALLY appeared before me D W Smoak and made oath that he/she saw the within named _____, sign, seal, and as their act and deed deliver the within written Easement and that he/she along with _____ witnessed the execution thereof.

SWORN TO before me this

26 day of March, 1982

Christine C Cutts

Notary Public

My Commission Expires: NOTARY PUBLIC STATE OF FLORIDA AT LARGE MY COMMISSION EXPIRES DEC 16 1985 BONDED THRU GENERAL INS. UNDERWRITERS

RECORDED IN OFFICIAL RECORDS BOOK OF MONROE COUNTY, FLORIDA. RECORD VERIFIED
RALPH W. WHITE
CLERK CIRCUIT COURT

This instrument was prepared by
Kelly S. Hodge, Assistant Counsel
for the Southern Division, Naval
Facilities Engineering Command,
P.O. Box 10068, Charleston, S.C. 29411

EASEMENT DEED

KNOW ALL MEN BY THESE PRESENTS:

THAT Landmark First National Bank of Fort Lauderdale, as Trustee for Residuary Trust U/W of Wyatt B. Hodges of Fort Lauderdale, Florida, hereinafter called the Grantor, for and in consideration of the sum of One Dollar ($1.00), the receipt and sufficiency of which is hereby acknowledged, has granted, bargained, sold and conveyed and by these presents does grant, bargain, sell and convey unto the United States of America and its assigns, hereinafter called the Government, an easement in perpetuity for the establishment, maintenance, operation and use of a compatible use zone in connection with the operation of the Naval Air Station, Key West, Florida in, upon, over and across that parcel of land situate in Monroe County, Florida, hereinafter called the Premises, more particularly described as follows:

DS Paid 45.00 Date 6-22-82
MONROE COUNTY
RALPH WHITE, CLERK OF CIR. CT.
By Marie Bethel D.C.

A parcel of land lying and being in the County of Monroe, State of Florida, as recorded in Official Records Book 93 at Page 407 of the Public Boards of Monroe County, Florida, being more particularly described as follows:

All of Government Lots 2 and 3 of Section 19, Township 67 South, Range 26 East, Monroe County, Florida;

Containing 122.75 acres more or less.

BY THIS GRANT OF EASEMENT the Grantor, for itself, (its heirs, successors, and assigns, as appropriate) covenants, as a covenant running with the Premises, that:

1. It will not use or permit use of the premises for the construction of dwellings or habitable facilities or for any purpose that is not included in the following list of Compatible Land Uses:

'82 JUN 22 P 3:55

Food and Kindred Product Manufacturing
Textile Mill Products Manufacturing
Apparel and other finished products made from Fabrics, Leather and Simulated Materials Manufacturing
Lumber and Wood products Manufacturing
Furniture and Fixtures Manufacturing
Paper and Allied Products Manufacturing
Printing and Publishing Industry
Chemicals and Allied Products Manufacturing
Rubber and Miscellaneous Plastic Products Manufacturing
Stone, Clay and Glass Products Manufacturing
Primary Metal Industries
Fabricated Metal Product Manufacturing
Railroad and Rapid Rail Transit
Motor Vehicle Transportation
Marine Craft Transportation
Highway and Street Right of Way
Automobile Parking
Transportation and Utilities
Agricultural and Agricultural Related Activities
Forestry Activities and Related Services
Fishing Activities and Related Services

Mining Activities and Related Services
Noncommercial Forest Development
Wholesale Trade
Retail Trade of Building Materials, General Merchandise, Goods, Autos, Marine, Aircraft, Apparel and Accessories, Furniture, Home Furnishings and Equipment, Eating and Drinking
Finance, Insurance & Real Estate Services
Personal Services
Business Services
Repair Services
Professional Services
Contract Construction Services
Outdoor Amusements
Sports Activities
Water Based Activities
Playgrounds and Neighborhood Parks
Community Parks

2. No man made or natural obstructions, including structures and trees, shall be constructed or permitted to grow so as to extend more than 116 feet above mean sea level and any such obstructions which extend above 116 feet above mean sea level shall be altered, trimmed, cut or otherwise removed by the Grantor. Provided, however, if the Grantor should fail to do so, the Government may in behalf of and at the expense of the Grantor effect such removal by the use of the Government forces or by contract, and in doing so shall have the right to salvage, sell, dispose of, or abandon in place any and all of the man made or natural obstructions so removed without liability to the Government.

3. All buildings on the premises will be designed, constructed, and equipped to reduce the noise level in the interior of the building 25 db below the external noise levels during aircraft operations.

4. The Government shall have the right of ingress and egress to, from and across the Premises at reasonable times and upon reasonable notice, to determine and insure compliance with the above covenant.

5. The easement herein granted is subject to all existing easements and rights of way for public roads and highways, public utilities, railroads and pipelines.

6. The Grantor reserves to itself, (its heirs, successors and assigns, as appropriate) all such rights and privileges in the Premises that do not interfere with, limit, or abridge the rights granted the Government and its assigns, hereunder, specifically reserving to the Grantor (its heirs, successors and assigns, as appropriate) the right and privilege to use, construct upon, and develop the Premises for those purposes, and those purposes only, which are specified in paragraph 1. above and within the height restrictions as set forth in paragraph 2. above.

This easement is granted subject to the condition that this easement shall cease and be terminated upon the written determination by the Government that it is no longer required for Government purposes.

IN WITNESS WHEREOF, the Grantor has caused this Easement Deed to be duly executed this 26th day of March, 1982

WITNESS:

Bonnie J. Sorrentino

Louise Shaffer

GRANTOR

Robert Schneider Vice Pres. & Trust Officer

STATE OF FLORIDA)
)
COUNTY OF Broward)

PERSONALLY appeared before me Bonnie J. Sorrentino and made oath that he/she saw the within named Robert Schneider, Vice Pres. & Trust Officer, sign, seal, and as their act and deed deliver the within written Easement and that he/she along with Louise Shaffer witnessed the execution thereof.

Jadwiga I. Lesiak

SWORN TO before me this

26 day of March, 1982

Notary Public, State of Florida at Large
My Commission Expires Sept. 4, 1984
Bonded Thru Troy Fain-Atkins Inc.

Notary Public

My Commission Expires: _____

RECORDED IN OFFICIAL RECORDS BOOK
OF CHARLESTON COUNTY, FLORIDA.
RECORD VERIFIED
RALPH W. WHITE
CLERK CIRCUIT COURT

This instrument was prepared by
Kelly S. Hodge, Assistant Counsel
for the Southern Division, Naval
Facilities Engineering Command,
P.O. Box 10068, Charleston, S.C. 29411

OFF REC 856 PG 1547

DATE
RESM 4-20-88
REG 11-1-88
MICRO 12-88
FILE 10-25-88

EASEMENT DEED

KNOW ALL MEN BY THESE PRESENTS:

THAT First National Bank in Ft. Lauderdale a/k/a Landmark First National Bank of Fort Lauderdale, Florida, hereinafter called the Grantor, for and in consideration of the sum of One Dollar ($1.00), the receipt and sufficiency of which is hereby acknowledged, has granted, bargained, sold and conveyed and by these presents does grant, bargain, sell and convey unto the United States of America and its assigns, hereinafter called the Government, an easement in perpetuity for the establishment, maintenance, operation and use of a compatible use zone in connection with the operation of the Naval Air Station, Key West, Florida in, upon, over and across that parcel of land situate in Monroe County, Florida, hereinafter called the Premises, more particularly described as follows:

> A parcel of land lying and being in the County of Monroe, State of Florida, as recorded in Official Records Book 93 at Page 407 of the Public Boards of Monroe County, Florida, being more particularly described as follows:
>
> All of Government Lots 2 and 3 of Section 19, Township 67 South, Range 26 East, Monroe County, Florida;
>
> Containing 122.75 acres more or less.

DS Paid 454 Date 6-22-82

RALPH WHITE CLERK OF CIR. CT. MONROE COUNTY

'82 JUN 22 P3:55

BY THIS GRANT OF EASEMENT the Grantor, for itself, (its heirs, successors, and assigns, as appropriate) covenants, as a covenant running with the Premises, that:

1. It will not use or permit use of the premises for the construction of dwellings or habitable facilities or for any purpose that is not included in the following list of Compatible Land Uses:

> Food and Kindred Product Manufacturing
> Textile Mill Products Manufacturing
> Apparel and other finished products made from Fabrics, Leather and Simulated Materials Manufacturing
> Lumber and Wood products Manufacturing
> Furniture and Fixtures Manufacturing
> Paper and Allied Products Manufacturing
> Printing and Publishing Industry
> Chemicals and Allied Products Manufacturing
> Rubber and Miscellaneous Plastic Products Manufacturing
> Stone, Clay and Glass Products Manufacturing
> Primary Metal Industries
> Fabricated Metal Product Manufacturing
> Railroad and Rapid Rail Transit
> Motor Vehicle Transportation
> Marine Craft Transportation

Highway and Street Right of Way
Automobile Parking
Transportation and Utilities
Agricultural and Agricultural Related Activities
Forestry Activities and Related Services
Fishing Activities and Related Services
Mining Activities and Related Services
Noncommercial Forest Development
Wholesale Trade
Retail Trade of Building Materials, General Merchandise, Goods, Autos, Marine, Aircraft, Apparel and Accessories, Furniture, Home Furnishings and Equipment, Eating and Drinking
Finance, Insurance & Real Estate Services
Personal Services
Business Services
Repair Services
Professional Services
Contract Construction Services
Outdoor Amusements
Sports Activities
Water Based Activities
Playgrounds and Neighborhood Parks
Community Parks

2. No man made or natural obstructions, including structures and trees, shall be constructed or permitted to grow so as to extend more than 116 feet above mean sea level and any such obstructions which extend above 116 feet above mean sea level shall be altered, trimmed, cut or otherwise removed by the Grantor. Provided, however, if the Grantor should fail to do so, the Government may in behalf of and at the expense of the Grantor effect such removal by the use of the Government forces or by contract, and in doing so shall have the right to salvage, sell, dispose of, or abandon in place any and all of the man made or natural obstructions so removed without liability to the Government.

3. All buildings on the premises will be designed, constructed, and equipped to reduce the noise level in the interior of the building 25 db below the external noise levels during aircraft operations.

4. The Government shall have the right of ingress and egress to, from and across the Premises at reasonable times and upon reasonable notice, to determine and insure compliance with the above covenant.

5. The easement herein granted is subject to all existing easements and rights of way for public roads and highways, public utilities, railroads and pipelines.

6. The Grantor reserves to itself, (its heirs, successors and assigns, as appropriate) all such rights and privileges in the Premises that do not interfere with, limit, or abridge the rights granted the Government and its assigns, hereunder, specifically reserving to the Grantor (its heirs, successors and assigns, as appropriate) the right and privilege to use, construct upon, and develop the Premises for those purposes, and those purposes only, which are specified in paragraph 1. above and within the height restrictions as set forth in paragraph 2. above.

This easement is granted subject to the condition that this easement shall cease and be terminated upon the written determination by the Government that it is no longer required for Government purposes.

IN WITNESS WHEREOF, the Grantor has caused this Easement Deed to be duly executed 6th day of April, 1982.

WITNESS:

Judith Stilts Fulton

Cynthia McCormick

GRANTOR:

Robert R. Schneider, Vice Pres. & Trust Officer

STATE OF FLORIDA)
)
COUNTY OF BROWARD)

PERSONALLY appeared before me Judith Stilts Fulton and made oath that he/she saw the within named Robert R. Schneider, Vice Pres. & Trust Officer, sign, seal, and as their act and deed deliver the within written Easement and that he/she along with Cynthia McCormick witnessed the execution thereof.

Jadwiga J. Swiatek

SWORN TO before me this 6th day of April, 1982

Notary Public, State of Florida at Large
My Commission Expires Sept. 4, 1984
Bonded Thru Gray Fain Insurance Inc.

NOTARY PUBLIC

My Commission Expires:_____

RECORDED IN OFFICIAL RECORDS BOOK OF MONROE COUNTY, FLORIDA.
RECORD VERIFIED
RALPH W. WHITE
CLERK CIRCUIT COURT

This instrument was prepared by
Kelly S. Hodge, Assistant Counsel
for the Southern Division, Naval
Facilities Engineering Command,
P.O. Box 10068, Charleston, S.C. 29411

MANAGEMENT AGREEMENT
FOR CERTAIN SUBMERGED LAND BORDERING BOCA CHICA KEY
IN MONROE COUNTY

Agreement No. 750-0014 N62467-85-RP-00235

THE BOARD OF TRUSTEES OF THE INTERNAL IMPROVEMENT TRUST FUND OF THE STATE OF FLORIDA, referred to herein as the "Board" and the DEPARTMENT OF NATURAL RESOURCES, DIVISION OF STATE LANDS, as agency for the Board hereby grants to the UNITED STATES DEPARTMENT OF THE NAVY herein referred to as the "Navy", authorization to manage the areas described in Exhibit "A" attached hereto and made a part hereof. The lands described in Exhibit "A" are delineated on map bearing the legend "NAVAL AIR STATION, KEY WEST, FLORIDA, FEE ACQUISITION MAP MASTER PARCEL LOCATION MAP, NAVFAC DRAWING NO. 5114073, attached hereto and made a part hereof as Exhibit "B". Specifically, authorization is hereby granted to the Navy to manage these lands in accordance with the Navy's Air Installation Compatible Use Zone (AICUZ) plan for property protection, and for management as a water recreation and conservation area.

W I T N E S S E T H

The Board and the Navy, for and in consideration of the covenants hereinafter contained do hereby covenant as follows:

1. Subject to all existing encumbrances and the terms and conditions of the subject parcel, the Board hereby grants the Navy authorization to manage the subject property for property protection, recreation, and conservation purposes, which shall not conflict with the conservation, protection, and enhancement of said lands, nor shall this Agreement be construed in any way to interfere with the maintenance of public navigation projects or other public works projects authorized by the United States Congress, nor shall this Agreement be construed to apply to any land title to which is not vested in the Board.

2. It is understood and agreed that in addition to the property protection, conservation, and recreation activities herein provided for under this Agreement, the Navy shall furnish the Board a plan within six (6) months of the date of this Agreement. The plan shall outline and provide details of how the protection activities proposed for the subject property will be implemented. Upon receipt and acceptance of the plan by the Board, it shall serve as a guideline for future protection activities to be provided on the property. The plan will be reviewed jointly by the Board, or its agent, and the Navy at no greater than five (5) year intervals and updated as necessary. The Navy shall have no right to use the premises for any activities other than those specified in the plan.

3. The Navy shall not engage in any activities except as provided for in the required plan without the advance written approval of the Board, pursuant to Section 253.034(4), Florida Statutes, and applicable rules.

4. Upon execution of this Agreement, the Navy shall have the right to enter and occupy the property for the purpose of fulfilling the activities designated in Paragraph 1.

5. The Board, or its designated representative, shall have the right at any time to inspect the works and operations of the Navy in any matter pertaining to this Agreement. Should the Navy fail to keep any of its covenants contained herein, the Board shall have the right to terminate this Agreement on the 60th day following written notice to the Navy, provided that the Navy fails to correct the deficiency within the 60 day period, and further provided that if the Navy takes corrective action satisfactory evidence shall be submitted to the Board of the corrective action taken.

6. The Board, or its designated representative, shall retain the right to enter onto the property or engage in management activities other than those provided in this Agreement, and shall retain the right to grant approval for uses of the property to third parties which are compatibile with the purpose and terms of this Agreement. Provided however, that the Board shall, by written notification, advise Navy's designated representative at least fifteen (15) days prior to engaging in any management activity contrary to or allowing third parties any use of the property subject to this Agreement. Should the Navy object to the proposed management activity or third party use, it shall provide to the Board's designated representative a written statement specifying its objection within ten (10) days of receipt of written notification of the proposed activity or use. Upon receipt of such objection, the Board shall stay the effective date of the proposed activity or use for thirty (30) days.

7. This Agreement shall endure so long as the Navy wishes to manage the area for the purposes stated herein, or until the Agreement is terminated, as provided for herein.

8. Should the Board determine a need of greater public benefit or necessity has arisen, the Board shall have the right to terminate the Agreement upon providing 60 days written notice to the Navy.

9. The Navy shall have the right to terminate this Agreement upon providing 60 days written notice to the Board.

10. This agreement and any rights and privileges contained herin are for the sole use of the Navy and shall not be assigned or transferred to any other party.

11. The Navy shall be responsible for all damages to persons or property of others including the Board, for the negligent acts or omissions of it's agents and employees in accordance with the Federal Tort Claims Act.

12. Section 267.061(1)(b), Florida Statutes, specifies that title to all treasure trove, artifacts, and such objects of antiquity having intrinsic, scientific or historical and archaeological value, which have been abondoned on state-owned lands or state-owned sovereignty submerged lands is vested in the Division of Archives, History and Records Management of the Department of State, for the purpose of administration and protection for the State of

Florida. Execution of this Agreement in no way affects any of the parties' obligations pursuant to Chapter 267, Florida Statutes. The disturbance of archaeological and historical sites on state-owned lands is prohibited unless prior authorization has been obtained from Archives. All proposals for changes in the character or use of state land shall be coordinated with Archives in order to mitigate potential damage or disturbance of, or to preserve, archaeological and historical sites and properties.

13. This Agreement does not convey any title interest to the area described in the Exhibit attached hereto.

14. Nothing herein shall be construed as binding the Navy to perform beyond its legal authority or to require it to assume or expend any sums in excess of monies which shall become available.

The Navy's authorized designated representative with respect to this Agreement is _____
All notices and correspondence under or arising from the terms of the Agreement, from the Board to the Navy shall be served on or mailed to this above stated address.

The Board's authorized designated representative with respect to the Agreement is _____.
All notices and correspondence under or arising from the terms of this Agreement, from the Navy to the Board shall be served on or mailed to the above stated address.

IN TESTIMONY WHEREOF, the legally designated agent of the Board, and legally designated agent of the Navy have hereunto set their hands.

SEAL:

THE BOARD OF TRUSTEES OF THE
INTERNAL IMPROVEMENT TRUST
FUND OF THE STATE OF FLORIDA

By: _____
Elton J. Gissendanner
Executive Director
Department of Natural Resources

Date: 8-6-85

WITNESS: Violet Davis

Date: 8-6-85

UNITED STATES DEPARTMENT
OF THE NAVY

By: _____
(Name and Title)

Date: 11 July 1985

WITNESS: Judith L. Owens

Date: 11 July 1985

NOTARY PUBLIC SOUTH CAROLINA
MY COMMISSION EXPIRES 8-17-1994

APPROVED AS TO
FORM AND LEGALITY
_____
GENERAL ATTORNEY

LEGAL DESCRIPTION FOR PARCEL NO. 15A

Those submerged lands lying and being in the County of Monroe, State of Florida having as its Northwesterly limits the high lands adjacent to and Southeasterly of U.S. Highway No. 1; as its Easterly and Southeasterly limits the high lands adjacent to and Westerly of State Road S941 (Old U.S. 4A) and as its Westerly limits the high lands of that subdivided portion of Government Lot 7 of Section 28, Township 67 South, Range 26 East, Monroe County, Florida, and the Easterly limits of the present United States of America U.S. Naval Air Station, Boca Chica Field;

Containing 500.0 acres more or less.

LEGAL DESCRIPTION FOR PARCEL NO. 15B

Those submerged lands lying and being in the County of Monroe, State of Florida having as its Northerly limits the present U.S. Highway No. 1; as its Easterly limits a portion of Government Lot 3 of Section 28; as its Southeasterly limits the Old U.S. Highway No. 1; and as its Westerly limits a portion of Government Lot 4 of said Section 28, all of Township 67 South, Range 26 East, Monroe County, Florida. Said submerged lands lying within that parcel designated in this project as Parcel No. 10;

Containing 25.0 acres more or less.

LEGAL DESCRIPTION FOR PARCEL NO. 15C

Those submerged lands lying and being in the County of Monroe, State of Florida having as its North limits the North line of Section 6, Township 68 South, Range 26 East, Monroe County, Florida; and as its East, South, and West limits the high land of a portion of Governmetn Lot 1 of said Section 6.

Said submerged lands lying adjacent to and North of that portion of said Government Lot 1 that has been designated in this project as Parcel No. 11.

Containing 8.8 acres more or less.

LEGAL DESCRIPTION FOR PARCEL NO. 15D

Those submerged lands lying and being in the County of Monroe, State of Florida having part of its North limits the North line of S.E. 1/4 of Section 32, its Western limits as the West line of the S.E. 1/4 of Section 32 and part of the Northerly boundary, its Eastern and Southern boundary the high land of a portion of Government Lots 6 and 7, Section 32, all lying in Township 67 South, Range 28 East.

Said submerged lands lying adjacent North and West of that portion of said Government Lot 6 and 7 that has been designated in this project as Parcel No. 17.

Containing 84.38 acres, more or less.

LEGAL DESCRIPTION FOR P[illegible]

Those submerged lands lying and being in the County of Monroe, State of Florida having as its North limits the North line of the S.W. 1/4 of the S.E. 1/4, Section 33, a portion of South boundary the high land of Government Lot 10 Section 33, the West Boundary and a portion of the South Boundary the high land of Government Lots 7 and 8, Section 32, all lying in Township 67 South, Range 28 East.

Said submerged lands lying adjacent to North and East of that portion of said Government Lot 1 that has been designated in this project as Parcel No. 17.

Containing 20.5 acres, more or less.

LEGAL DESCRIPTION FOR PARCEL 19

A portion of Government Lot 6, in Section 31, Township 67 South, Range 26 East, Monroe County, Florida, being more particularly described as follows:

Commence at the Northeast corner of Lot 20, Block A, of Boca Chica Beach as recorded in Plat Book 3, at Page 28 of the Public Records of Monroe County, Florida; thence S 89°39'46"E along the South line of said Section 31 for 361.41 to the Point of Beginning; thence N 38°56'02"E for 267.37 feet; thence S 00°18'38"W along the East line of said Government Lot 6 for 208.96 feet; thence N 89°39'46"W along the South line of said Section 31 for 166.89 feet to the Point of Beginning;

Containing 0.40 Acres more or less

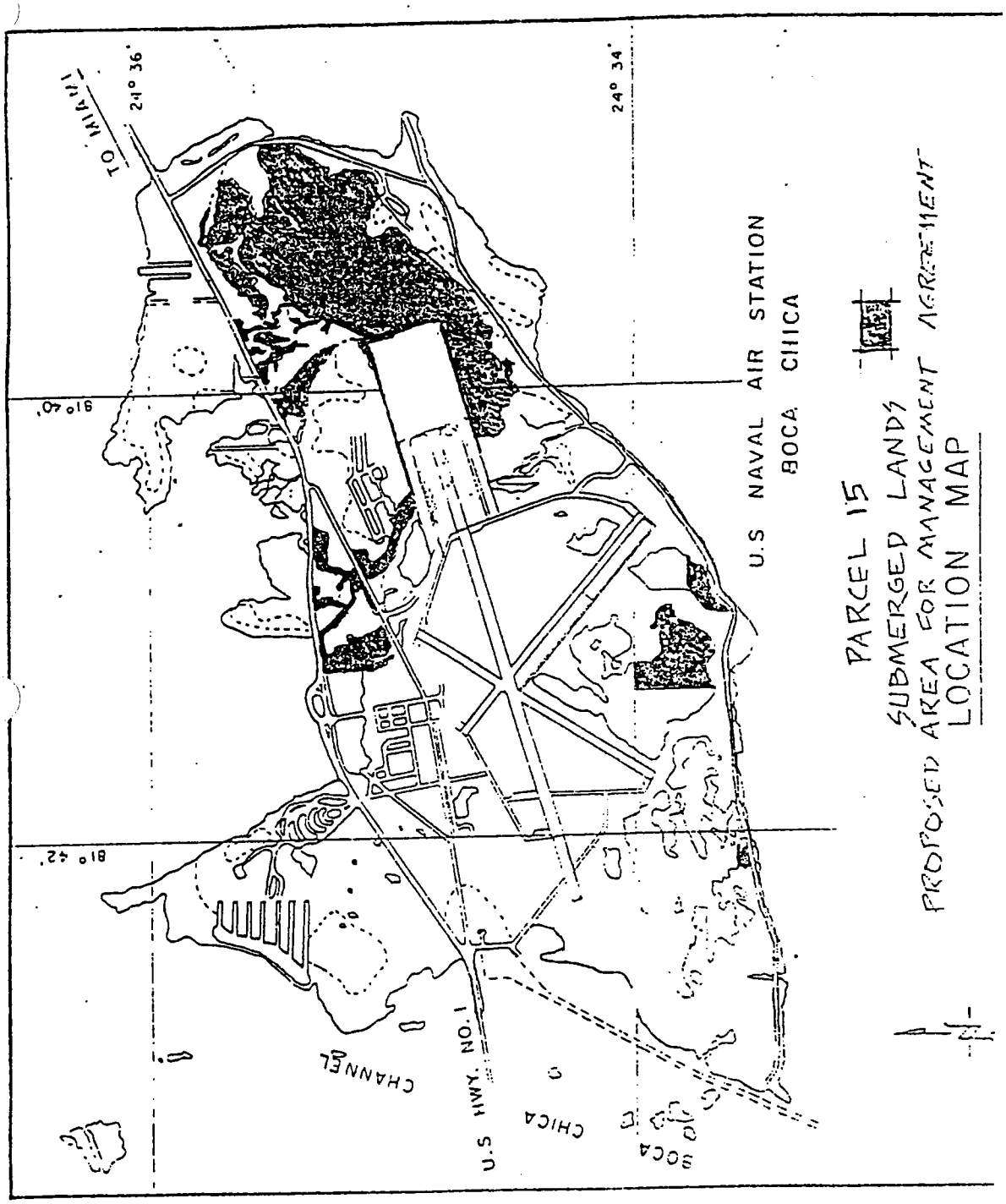


Exhibit B as shown is a composit of "NAVAL AIR STATION, KEY WEST, FLORIDA FEE ACQUISITION MAP MASTER PARCEL LOCATION MAP, NAVAL DRAWING NO. 5114073"

PLAN
IN CONNECTION WITH MANAGEMENT AGREEMENT
FOR CERTAIN SUBMERGED LAND BORDERING BOCA CHICA KEY
MONROE COUNTY, FL

1. The objective of this plan is to set forth procedures for the management of property covered by the Management Agreement No. 750-0014 over certain submerged land bordering the Naval Air Station, Boca Chica, Key West, Florida. The property will be utilized in a manner consistent with the Air Installations Compatible Use Zone (AICUZ) attached hereto as Appendix A, for property protection, and for management as a water recreation and conservation area.

2. To the extent that resources of the Naval Air Station are available for such purposes, the Navy will:

a. Provide surveillance over the submerged land for the purpose of protecting the property from:

(1) Dumping of wastes (liquid and solid)

(2) Dredge or fill activities of any type

(3) Construction activities not covered by permit issued by the State of Florida

(4) Any other activity which would contaminate the waters or degrade the land of either the property covered by this agreement or adjacent Navy property.

(5) Hunting, discharging of firearms, commercial fishing, and commercial collection of plant and animal specimens.

(6) Trespassing to the extent that the submerged lands are used as access to Naval Air Station property.

(7) Activities which generate smoke, fog, physical obstructions, electromagnetic interference, or other interference to aircraft operations at the adjoining Naval Air Station.

(8) Any other unlawful activity which would be detrimental to the natural environment of the property.

3. Normal recreational activities by the public on the submerged lands such as swimming, boating, bird watching, nature studies, non-commercial fishing, and other such non-controversial activities will not be restricted by Navy Management of the property except that any activities involving large numbers of people (over 25) shall be subject to the approval of the Commanding Officer, Naval Air Station, Key West, Florida.

4. Enforcement action by the Navy will consist of issuing oral and written warnings to violators based on the authority of Management Agreement No. 750-0014 and this Plan. Should the violating activities persist, said violations will be referred to federal, state, or county law enforcement agencies, other appropriate regulating authorities, or the Florida State Department of Natural Resources.

C. Agreements to Limit Encroachments and other Constraints on Military Training, Testing, and Operations, Title 10, United State Code [USC], Section 2684a.

(2) The table of sections at the beginning of such subchapter is amended by inserting after the item relating to section 2881 the following new item:

"2881a. Pilot projects for acquisition or construction of military unaccompanied housing.".

(b) CONFORMING AMENDMENT.—Section 2871(7) of title 10, United States Code, is amended by inserting before the period at the end the following: "and transient housing intended to be occupied by members of the armed forces on temporary duty".

SEC. 2804. REPEAL OF SOURCE REQUIREMENTS FOR FAMILY HOUSING CONSTRUCTION OVERSEAS.

Section 803 of the Military Construction Authorization Act, 1984 (Public Law 98–115; 10 U.S.C. 2821 note) is repealed.

SEC. 2805. AVAILABILITY OF ENERGY COST SAVINGS REALIZED AT MILITARY INSTALLATIONS.

Section 2865(b) of title 10, United States Code, is amended by striking "through the end of the fiscal year following the fiscal year for which the funds were appropriated" and inserting "until expended".

Subtitle B—Real Property and Facilities Administration

SEC. 2811. AGREEMENTS TO LIMIT ENCROACHMENTS AND OTHER CONSTRAINTS ON MILITARY TRAINING, TESTING, AND OPERATIONS.

(a) IN GENERAL.—Chapter 159 of title 10, United States Code, is amended by inserting after section 2684 the following new section:

"§ 2684a. Agreements to limit encroachments and other constraints on military training, testing, and operations

"(a) AGREEMENTS AUTHORIZED.—The Secretary of Defense or the Secretary of a military department may enter into an agreement with an eligible entity described in subsection (b) to address the use or development of real property in the vicinity of a military installation for purposes of—

"(1) limiting any development or use of the property that would be incompatible with the mission of the installation; or

"(2) preserving habitat on the property in a manner that—

"(A) is compatible with environmental requirements; and

"(B) may eliminate or relieve current or anticipated environmental restrictions that would or might otherwise restrict, impede, or otherwise interfere, whether directly or indirectly, with current or anticipated military training, testing, or operations on the installation.

"(b) ELIGIBLE ENTITIES.—An agreement under this section may be entered into with any of the following:

"(1) A State or political subdivision of a State.

"(2) A private entity that has as its stated principal organizational purpose or goal the conservation, restoration, or preservation of land and natural resources, or a similar purpose or goal, as determined by the Secretary concerned.

"(c) INAPPLICABILITY OF CERTAIN CONTRACT REQUIREMENTS.—Chapter 63 of title 31 shall not apply to any agreement entered into under this section.

"(d) ACQUISITION AND ACCEPTANCE OF PROPERTY AND INTERESTS.—(1) An agreement with an eligible entity under this section may provide for—

"(A) the acquisition by the entity of all right, title, and interest in and to any real property, or any lesser interest in the property, as may be appropriate for purposes of this section; and

"(B) the sharing by the United States and the entity of the acquisition costs.

"(2) Property or interests may not be acquired pursuant to the agreement unless the owner of the property or interests consents to the acquisition.

"(3) The agreement shall require the entity to transfer to the United States, upon the request of the Secretary concerned, all or a portion of the property or interest acquired under the agreement or a lesser interest therein. The Secretary shall limit such transfer request to the minimum property or interests necessary to ensure that the property concerned is developed and used in a manner appropriate for purposes of this section.

"(4) The Secretary concerned may accept on behalf of the United States any property or interest to be transferred to the United States under the agreement.

"(5) For purposes of the acceptance of property or interests under the agreement, the Secretary concerned may accept an appraisal or title documents prepared or adopted by a non-Federal entity as satisfying the applicable requirements of section 301 of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (42 U.S.C. 4651) or section 3111 of title 40, if the Secretary concerned finds that the appraisal or title documents substantially comply with the requirements.

"(e) ACQUISITION OF WATER RIGHTS.—The authority of the Secretary concerned to enter into an agreement under this section for the acquisition of real property (or an interest therein) includes the authority to support the purchase of water rights from any available source when necessary to support or protect the mission of a military installation.

"(f) ADDITIONAL TERMS AND CONDITIONS.—The Secretary concerned may require such additional terms and conditions in an agreement under this section as the Secretary considers appropriate to protect the interests of the United States.

"(g) FUNDING.—(1) Except as provided in paragraph (2), funds authorized to be appropriated for operation and maintenance of the Army, Navy, Marine Corps, Air Force, or Defense-wide activities may be used to enter into agreements under this section.

"(2) In the case of a military installation operated primarily with funds authorized to be appropriated for research, development, test, and evaluation, funds authorized to be ap-

propriated for the Army, Navy, Marine Corps, Air Force, or Defense-wide activities for research, development, test, and evaluation may be used to enter into agreements under this section with respect to the installation.

"(h) DEFINITIONS.—In this section:

"(1) The term 'Secretary concerned' means the Secretary of Defense or the Secretary of a military department.

"(2) The term 'State' includes the District of Columbia, the Commonwealth of Puerto Rico, the Commonwealth of the Northern Marianas, and the territories and possessions of the United States.".

(b) CLERICAL AMENDMENT.—The table of sections at the beginning of such chapter is amended by inserting after the item relating to section 2684 the following new item:

"2684a. Agreements to limit encroachments and other constraints on military training, testing, and operations.".

SEC. 2812. CONVEYANCE OF SURPLUS REAL PROPERTY FOR NATURAL RESOURCE CONSERVATION PURPOSES.

(a) CONVEYANCE AUTHORITY.—(1) Chapter 159 of title 10, United States Code, is amended by inserting after section 2694 the following new section:

"§ 2694a. Conveyance of surplus real property for natural resource conservation

"(a) AUTHORITY TO CONVEY.—The Secretary of a military department may convey to an eligible entity described in subsection (b) any surplus real property that—

"(1) is under the administrative control of the Secretary;

"(2) is suitable and desirable for conservation purposes;

"(3) has been made available for public benefit transfer for a sufficient period of time to potential claimants; and

"(4) is not subject to a pending request for transfer to another Federal agency or for conveyance to any other

qualified recipient for public benefit transfer under the real property disposal processes and authorities under subtitle I of title 40.

"(b) ELIGIBLE ENTITIES.—The conveyance of surplus real property under this section may be made to any of the following:

"(1) A State or political subdivision of a State.

"(2) A nonprofit organization that exists for the primary purpose of conservation of natural resources on real property.

"(c) REVISIONARY INTEREST AND OTHER DEED REQUIREMENTS.—(1) The deed of conveyance of any surplus real property conveyed under this section shall require the property to be used and maintained for the conservation of natural resources in perpetuity. If the Secretary concerned determines at any time that the property is not being used or maintained for such purpose, then, at the option of the Secretary, all or any portion of the property shall revert to the United States.

"(2) The deed of conveyance may permit the recipient of the property—

"(A) to convey the property to another eligible entity, subject to the approval of the Secretary concerned and subject to the same covenants and terms and conditions as provided in the deed from the United States; and

"(B) to conduct incidental revenue-producing activities on the property that are compatible with the use of the property for conservation purposes.

"(3) The deed of conveyance may contain such additional terms, reservations, restrictions, and conditions as the Secretary concerned considers appropriate to protect the interests of the United States.

"(d) RELEASE OF COVENANTS.—With the concurrence of the Secretary of Interior, the Secretary concerned may grant a release from a covenant included in the deed of conveyance of real property conveyed under this section, subject to the condition that the recipient of the property pay the fair market value, as determined by the Secretary concerned, of the prop-

erty at the time of the release of the covenant. The Secretary concerned may reduce the amount required to be paid under this subsection to account for the value of the natural resource conservation benefit that has accrued to the United States during the period the covenant was in effect, if the benefit was not taken into account in determining the original consideration for the conveyance.

"(e) CONGRESSIONAL NOTIFICATION.—The Secretary concerned may not approve of the reconveyance of real property under subsection (c) or grant the release of a covenant under subsection (d) until the Secretary notifies the appropriate committees of Congress of the proposed reconveyance or release and a period of 21 days elapses from the date the notification is received by the committees.

"(f) LIMITATIONS.—The conveyance of real property under this section shall not be used as a condition of allowing any defense activity under any Federal, State, or local permitting or review process. The Secretary concerned may make the conveyance, with the restrictions specified in subsection (c), to establish a mitigation bank, but only if the establishment of the mitigation bank does not occur in order to satisfy any condition for permitting military activity under a Federal, State, or local permitting or review process.

"(g) CONSIDERATION.—In fixing the consideration for the conveyance of real property under this section, or in determining the amount of any reduction of the amount to be paid for the release of a covenant under subsection (d), the Secretary concerned shall take into consideration any benefit that has accrued or may accrue to the United States from the use of such property for the conservation of natural resources.

"(h) RELATION TO OTHER CONVEYANCE AUTHORITIES.—(1) The Secretary concerned may not make a conveyance under this section of any real property to be disposed of under a base closure law in a manner that is inconsistent with the requirements and conditions of the base closure law.

"(2) In the case of real property on Guam, the Secretary concerned may not make a conveyance under this section unless

the Government of Guam has been first afforded the opportunity to acquire the real property as authorized by section 1 of Public Law 106–504 (114 Stat. 2309).

"(i) DEFINITIONS.—In this section:

"(1) The term 'appropriate committees of Congress' has the meaning given such term in section 2801 of this title.

"(2) The term 'base closure law' means the following:

"(A) Section 2687 of this title.

"(B) Title II of the Defense Authorization Amendments and Base Closure and Realignment Act of 1988 (10 U.S.C. 2687 note).

"(C) The Defense Base Closure and Realignment Act of 1990 (part A of title XXIX of Public Law 101–510; 10 U.S.C. 2687 note).

"(D) Any other similar authority for the closure or realignment of military installations that is enacted after the date of the enactment of the Bob Stump National Defense Authorization Act for Fiscal Year 2003.

"(3) The term 'Secretary concerned' means the Secretary of a military department.

"(4) The term 'State' includes the District of Columbia, the Commonwealth of Puerto Rico, the Commonwealth of the Northern Marianas, and the territories and possessions of the United States.".

(2) The table of sections at the beginning of such chapter is amended by inserting after the item relating to section 2694 the following new item:

"2694a. Conveyance of surplus real property for natural resource conservation.".

(b) ACCEPTANCE OF FUNDS TO COVER ADMINISTRATIVE EXPENSES.—Section 2695(b) of such title is amended by adding at the end the following new paragraph:

"(5) The conveyance of real property under section 2694a of this title.".

(c) AGREEMENTS WITH NONPROFIT NATURAL RESOURCE CONSERVATION ORGANIZATIONS.—Section 2701(d) of such title is amended—

(1) in the subsection heading, by striking "AGENCIES" and inserting "ENTITIES";

(2) in paragraph (1)—

(A) by striking "with any State or local government agency, or with any Indian tribe," and inserting "any State or local government agency, any Indian tribe, or any nonprofit conservation organization"; and

(B) by striking "the agency" and inserting "the agency, Indian tribe, or organization"; and

(3) by striking paragraph (4), as redesignated by section 311(2) of this Act, and inserting the following new paragraph:

"(4) DEFINITIONS.—In this subsection:

"(A) The term 'Indian tribe' has the meaning given such term in section 101(36) of CERCLA (42 U.S.C. 9601(36)).

"(B) The term 'nonprofit conservation organization' means any non-governmental nonprofit organization whose primary purpose is conservation of open space or natural resources.".

SEC. 2813. MODIFICATION OF DEMONSTRATION PROGRAM ON REDUCTION IN LONG-TERM FACILITY MAINTENANCE COSTS.

(a) ADMINISTRATOR OF PROGRAM.—Subsection (a) of section 2814 of the Military Construction Authorization Act for Fiscal Year 2002 (division B of Public Law 107–107; 115 Stat. 1310; 10 U.S.C. 2809 note) is amended by striking "Secretary of the Army" and inserting "Secretary of Defense or the Secretary of a military department".

(b) CONTRACTS.—Subsection (b) of such section is amended to read as follows:

"(b) CONTRACTS.—(1) Not more than 12 contracts per military department may contain requirements referred to in subsection (a) for the purpose of the demonstration program.

D. Discussion of Noise and its Effect on the Environment

DISCUSSION OF NOISE AND ITS EFFECT ON THE ENVIRONMENT, WYLE LABORATORIES

A.1 NOISE

A.1.1 General

Noise, often defined as unwanted sound, is one of the most common environmental issues associated with aircraft operations. Of course, aircraft are not the only sources of noise in an urban or suburban surrounding, where interstate and local roadway traffic, rail, industrial, and neighborhood sources also intrude on the everyday quality of life. Nevertheless, aircraft are readily identifiable to those affected by their noise and are typically singled out for special attention and criticism. Consequently, aircraft noise problems often dominate analyses of environmental impacts.

Sound is a physical phenomenon consisting of minute vibrations which travel through a medium, such as air, and are sensed by the human ear. Whether that sound is interpreted as pleasant (for example, music) or unpleasant (for example, aircraft noise) depends largely on the listener's current activity, past experience, and attitude toward the source of that sound. It is often true that one person's music is another person's noise.

The measurement and human perception of sound involves two basic physical characteristics – intensity and frequency. Intensity is a measure of the acoustic energy of the sound vibrations and is expressed in terms of sound pressure. The higher the sound pressure, the more energy carried by the sound and the louder the perception of that sound. The second important physical characteristic is sound frequency which is the number of times per second the air vibrates or oscillates. Low-frequency sounds are characterized as rumbles or roars, while high-frequency sounds are typified by sirens or screeches.

The loudest sounds which can be detected comfortably by the human ear have intensities which are 1,000,000,000,000 times larger than those of sounds which can just be detected. Because of this vast range, any attempt to represent the intensity of sound using a linear scale becomes very unwieldy. As a result, a logarithmic unit known as the decibel (abbreviated dB) is used to represent the intensity of a sound. Such a representation is called a sound level.

A sound level of 0 dB is approximately the threshold of human hearing and is barely audible under extremely quiet listening conditions. Normal speech has a sound level of approximately 60 dB. Sound levels above about 120 dB begin to be felt inside the human ear as discomfort and eventually pain at still higher levels.

Because of the logarithmic nature of the decibel unit, sound levels cannot be added or subtracted directly and are somewhat cumbersome to handle mathematically. However, some simple rules of thumb are useful in dealing with sound levels. First, if a sound's intensity is doubled, the sound level increases by 3 dB, regardless of the initial sound level. Thus, for example:

60 dB + 60 dB = 63 dB, and
80 dB + 80 dB = 83 dB.

The total sound level produced by two sounds of different levels is usually only slightly more than the higher of the two. For example:

60.0 dB + 70.0 dB = 70.4 dB.

Because the addition of sound levels behaves differently than that of ordinary numbers, such addition is often referred to as "decibel addition" or "energy addition". The latter term arises from the fact that what we are really doing when we add decibel values is first converting each decibel value to its corresponding acoustic energy, then adding the energies using the normal rules of addition, and finally converting the total energy back to its decibel equivalent.

An important facet of decibel addition arises later when the concept of time-average sound levels is introduced to explain Day-Night Average Sound Level. Because of the logarithmic units, the time-average sound level is dominated by the louder levels which occur during the averaging period. As a simple example, consider a sound level which is 100 dB and lasts for 30 seconds, followed by a sound level of 50 dB which also lasts for 30 seconds. The time-average sound level over the total 60-second period is 97 dB, not 75 dB.

The minimum change in the sound level of individual events which an average human ear can detect is about 3 dB. A change in sound level of about 10 dB is usually perceived by the average person as a doubling (or halving) of the sound's loudness, and this relation holds true for loud sounds and for quieter sounds. A decrease in sound level of 10 dB actually represents a 90 percent decrease in sound intensity but only a 50 percent decrease in perceived loudness because of the nonlinear response of the human ear (similar to most human senses).

Sound frequency is measured in terms of cycles per second (cps), or hertz (Hz), which is the preferred scientific unit for cps. The normal human ear can detect sounds which range in frequency from about 20 Hz to about 15,000 Hz. All sounds in this wide range of frequencies, however, are not heard equally well by the human ear, which is most sensitive to frequencies

in the 1000 to 4000 Hz range. In measuring community noise, this frequency dependence is taken into account by adjusting the very high and very low frequencies to approximate the human ear's lower sensitivity to those frequencies. This is called "A-weighting" and is commonly used in measurements of community environmental noise.

Sound levels measured using A-weighting are most properly called A-weighted sound levels while sound levels measured without any frequency weighting are most properly called sound levels. However, since most environmental impact analysis documents deal only with A-weighted sound levels, the adjective "A-weighted" is often omitted, and A-weighted sound levels are referred to simply as sound levels. In some instances, the author will indicate that the levels have been A-weighted by using the abbreviation dBA or dB(A), rather than the abbreviation dB, for decibel. As long as the use of A-weighting is understood to be used, there is no difference implied by the terms "sound level" and "A-weighted sound level" or by the units dB, dBA, and dB(A).

In this document all sound levels are A-weighted sound levels and the adjective "A-weighted" has been omitted.

Sound levels do not represent instantaneous measurements but rather averages over short periods of time. Two measurement time periods are most common – one second and one-eighth of a second. A measured sound level averaged over one second is called a slow response sound level; one averaged over one-eighth of a second is called a fast response sound level. Most environmental noise studies use slow response measurements, and the adjective "slow response" is usually omitted. It is easy to understand why the proper descriptor "slow response A-weighted sound level" is usually shortened to "sound level" in environmental impact analysis documents.

A.1.2 Noise Metrics

A "metric" is defined as something "of, involving, or used in measurement." As used in environmental noise analyses, a metric refers to the unit or quantity which quantitatively measures the effect of noise on the environment. Noise studies have typically involved a confusing proliferation of noise metrics as individual researchers have attempted to understand and represent the effects of noise. As a result, past literature describing environmental noise or environmental noise abatement has included many different metrics.

Recently, however, various federal agencies involved in environmental noise mitigation have agreed on common metrics for environmental impact analysis documents, and both the Department of Defense and the Federal Aviation Administration have specified those which should be used for federal aviation noise assessments. These metrics are as follows.

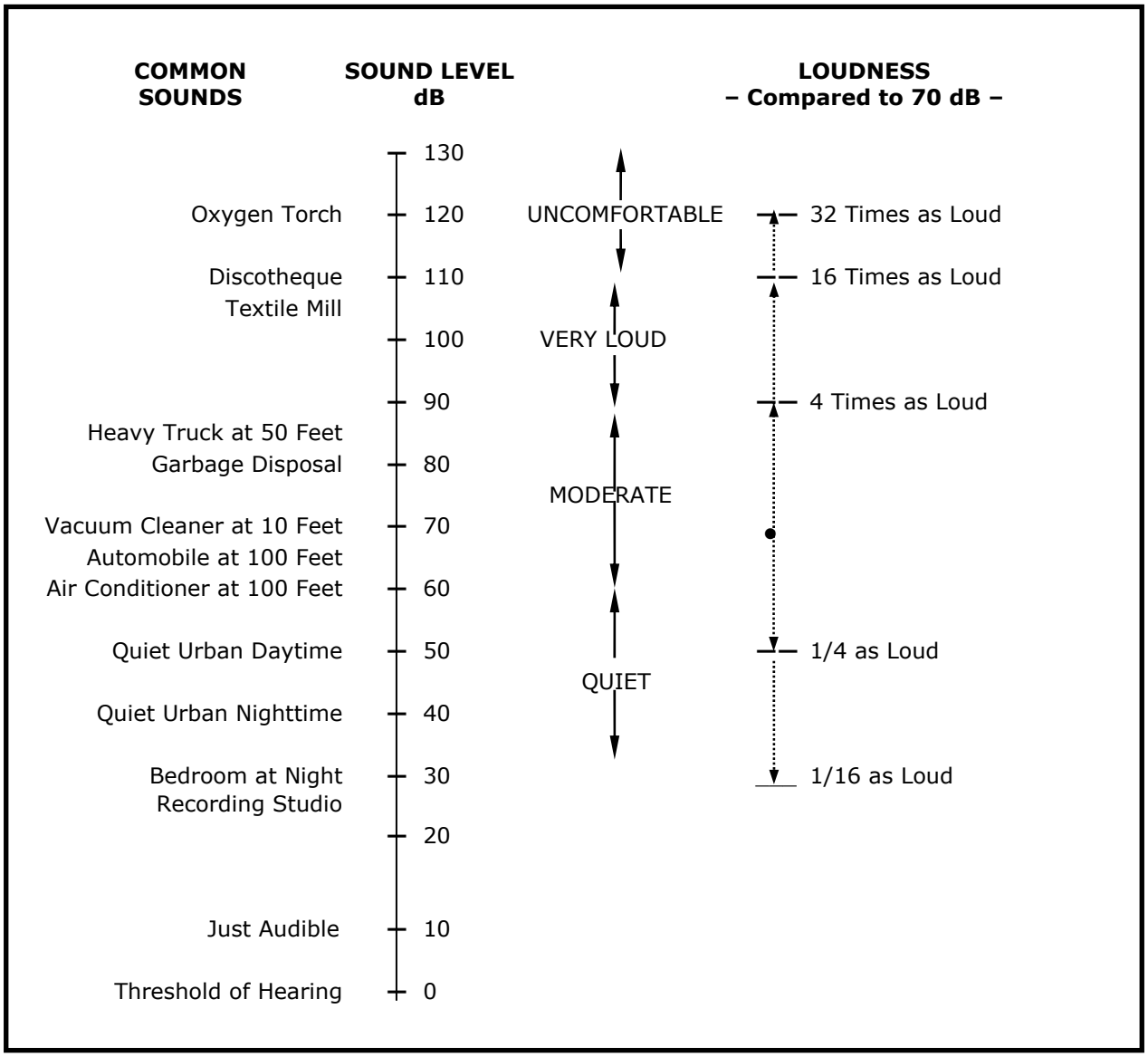
A.1.2.1 Maximum Sound Level

The highest A-weighted sound level measured during a single event in which the sound level changes value as time goes on (e.g., an aircraft overflight) is called the maximum A-weighted sound level or maximum sound level, for short. It is usually abbreviated by ALM, L_{max} or L_{Amax} .

The maximum sound levels of typical events are shown in Figure A-1. The maximum sound level is important in judging the interference caused by a noise event with conversation, TV or radio listening, sleep, or other common activities.

A.1.2.2 Sound Exposure Level

Individual time-varying noise events have two main characteristics – a sound level which changes throughout the event and a period of time during which the event is heard. Although the maximum sound level, described above, provides some measure of the intrusiveness of the event, it alone does not completely describe the total event. The period of time during which the sound is heard is also significant. The Sound Exposure Level (abbreviated SEL or L_{AE}) combines both of these characteristics into a single metric.



Source: *Handbook of Noise Control*, C.M. Harris, Editor, McGraw-Hill Book Co., 1979, and Ref. A5.

Figure A-1. Typical A-Weighted Sound Levels of Common Sounds.

Sound Exposure Level is a logarithmic measure of the total acoustic energy transmitted to the listener during the event. Mathematically, it represents the sound level of the constant sound that would, in one second, generate the same acoustic energy as did the actual time-varying noise event. Since aircraft overflights usually last longer than one second, the Sound Exposure Level of an overflight is usually greater than the maximum sound level of the overflight.

Note that sound exposure level is a composite metric which represents both the intensity of a sound and its duration. It does not directly represent the sound level heard at any given time, but rather provides a measure of the net impact of the entire acoustic event. It has been well established in the scientific community that Sound Exposure Level measures this impact much more reliably than just the maximum sound level.

Because the Sound Exposure Level and the maximum sound level are both A-weighted sound levels expressed in decibels, there is sometimes confusion between the two, so the specific metric used should be clearly stated.

A.1.2.3 Day-Night Average Sound Level

Time-average sound levels are measurements of sound levels which are averaged over a specified length of time. These levels provide a measure of the average sound energy during the measurement period.

For the evaluation of community noise effects, and particularly aircraft noise effects, the Day-Night Average Sound Level (abbreviated DNL or L_{dn}) is used. Day-Night Average Sound Level averages aircraft sound levels at a location over a complete 24-hour period, with a 10-decibel adjustment added to those noise events which take place between 10:00 p.m. and 7:00 a.m. (local time) the following morning. This 10-decibel "penalty" represents the added intrusiveness of sounds which occur during normal sleeping hours, both because of the increased sensitivity to noise during those hours and because ambient sound levels during nighttime are typically about 10 dB lower than during daytime hours.

Ignoring the 10-decibel nighttime adjustment for the moment, Day-Night Average Sound Level may be thought of as the continuous A-weighted Sound Level which would be present if all of the variations in sound level which occur over a 24-hour period were smoothed out so as to contain the same total sound energy.

Day-Night Average Sound Level provides a single measure of overall noise impact, but does not provide specific information on the number of noise events or the individual sound levels which occur during the day. For example, a Day-Night Average Sound Level of 65 dB could result from a very few noisy events, or a large number of quieter events.

As noted earlier for Sound Exposure Level, Day-Night Average Sound Level does not represent the sound level heard at any particular time, but rather represents the total sound

exposure. Scientific studies and social surveys which have been conducted to appraise community annoyance to all types of environmental noise have found the Day-Night Average Sound Level to be the best measure of that annoyance. Its use is endorsed by the scientific community (References A1 through A5).

There is, in fact, a remarkable consistency in the results of attitudinal surveys about aircraft noise conducted in different countries to find the percentages of groups of people who express various degrees of annoyance when exposed to different levels of Day-Night Average Sound Level. This is illustrated in Figure A-2, which summarizes the results of a large number of social surveys relating community responses to various types of noises, measured in Day-Night Average Sound Level.

Reference A6, from which Figure A-2 was taken, was published in 1978. A more recent study has reaffirmed this relationship (Reference A7). In general, correlation coefficients of 0.85 to 0.95 are found between the percentages of groups of people highly annoyed and the level of average noise exposure. The correlation coefficients for the annoyance of individuals are relatively low, however, on the order of 0.5 or less. This is not surprising, considering the varying personal factors which influence the manner in which individuals react to noise. Nevertheless, findings substantiate that community annoyance to aircraft noise is represented quite reliably using Day-Night Average Sound Level.

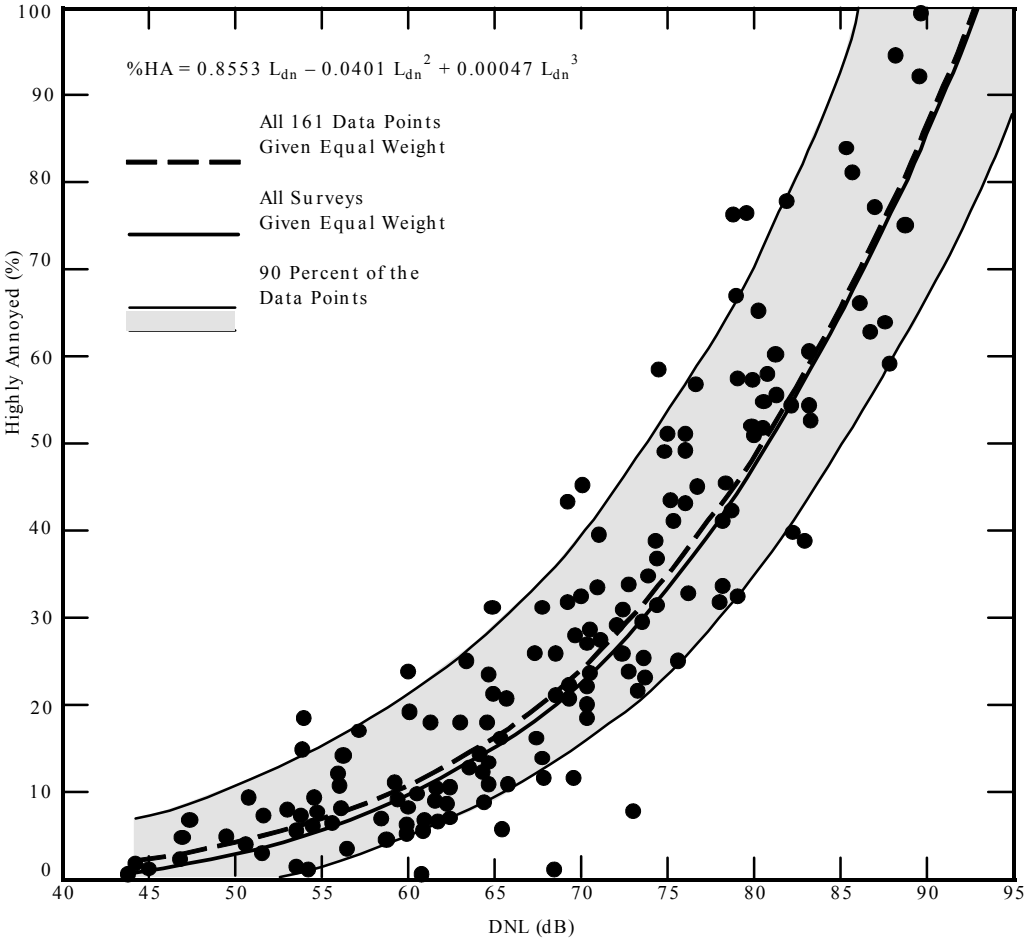


Figure A-2. Community Surveys of Noise Annoyance (Schulz, 1978)

This relation between community annoyance and time-average sound level has been confirmed, even for infrequent aircraft noise events. Reference A8 reported the reactions of individuals in a community to daily helicopter overflights, ranging from one to 32 per day. The stated reactions to infrequent helicopter overflights correlated quite well with the daily time-average sound levels over this range of numbers of daily noise events.

The use of Day-Night Average Sound Level has been criticized recently as not accurately representing community annoyance and land-use compatibility with aircraft noise. Much of that criticism stems from a lack of understanding of the basis for the measurement or calculation of L_{dn} . One frequent criticism is based on the inherent feeling that people react more to single noise events and not as much to "meaningless" time-average sound levels.

In fact, a time-average noise metric, such as L_{dn} , takes into account both the noise levels of all individual events which occur during a 24-hour period and the number of times those events occur. As described briefly above, the logarithmic nature of the decibel unit causes the noise levels of the loudest events to control the 24-hour average.

As a simple example of this characteristic, consider a case in which only one aircraft overflight occurs in daytime during a 24-hour period, creating a sound level of 100 dB for 30 seconds. During the remaining 23 hours, 59 minutes, and 30 seconds of the day, the ambient sound level is 50 dB. The Day-Night Average Sound Level for this 24-hour period is 65.5 dB. Assume, as a second example, that ten such 30-second overflights occur in daytime hours during the next 24-hour period, with the same ambient sound level of 50 dB during the remaining 23 hours and 55 minutes of the day. The Day-Night Average Sound Level for this 24-hour period is 75.4 dB. Clearly, the averaging of noise over a 24-hour period does not ignore the louder single events and tends to emphasize both the sound levels and number of those events. This is the basic concept of a time-average sound metric, and specifically the Day-Night Average Sound Level.

A.1.2.4 Onset-Rate Adjusted Day-Night Average Sound Level

Aircraft operations along low-altitude Military Training Routes (MTRs) and in Military Operating Areas (MOAs) and Restricted Areas/Ranges generate a noise environment different from other community noise environments. Overflights can be highly sporadic, ranging from many (e.g., ten per hour) to few (less than one per week). This situation differs from most community noise environments in which noise tends to be continuous or patterned.

Individual military overflight events also differ from typical community noise events, because of the low-altitude and high-airspeed characteristics of military aircraft. These characteristics result in aircraft that exhibit a rate of increase in sound level (onset rate) of up to 30 dB per second. The Day-Night Average Sound Level metric is adjusted to account for the "surprise" effect of the onset rate of aircraft noise on humans with an adjustment ranging up to 11 dB added to the normal Sound Exposure Level (Reference A9). Onset rates between 15 to 150 dB per second require an adjustment of from 0 to 11 dB, while onset rates below 15 dB per second require no adjustment. The adjusted Day-Night Average Sound Level is designated as Onset-Rate Adjusted Day-Night Average Sound Level (abbreviated L_{dnr}). Because of the sporadic occurrences of aircraft overflights along MTRs, in MOAs and Restricted Areas/Ranges, the number of average daily operations is determined from the

calendar month with the highest number of operations in each area. This monthly average is denoted L_{dnmr} .

A.2 NOISE EFFECTS

A.2.1 Hearing Loss

Noise-induced hearing loss is probably the best defined of the potential effects of human exposure to excessive noise. Federal workplace standards for protection from hearing loss allow a time-average level of 90 dB over an 8-hour work period, or 85 dB averaged over a 16-hour period. Even the most protective criterion (no measurable hearing loss for the most sensitive portion of the population at the ear's most sensitive frequency, 4000 Hz, after a 40-year exposure) suggests a time-average sound level of 70 dB over a 24-hour period. Since it is unlikely that airport neighbors will remain outside their homes 24 hours per day for extended periods of time, there is little possibility of hearing loss below a Day-Night Average Sound Level of 75 dB, and this level is extremely conservative.

A.2.2 Nonauditory Health Effects

Nonauditory health effects of long-term noise exposure, where noise may act as a risk factor, have never been found to occur at levels below those protective against noise-induced hearing loss, described above. Most studies attempting to clarify such health effects have found that noise exposure levels established for hearing protection will also protect against any potential nonauditory health effects, at least in workplace conditions. The best scientific summary of these findings is contained in the lead paper at the National Institutes of Health Conference on Noise and Hearing Loss, held on 22–24 January 1990 in Washington, D.C.:

> "The nonauditory effects of chronic noise exposure, when noise is suspected to act as one of the risk factors in the development of hypertension, cardiovascular disease, and other nervous disorders, have never been proven to occur as chronic manifestations at levels below these criteria (an average of 75 dBA for complete protection against hearing loss for an eight-hour day). At the 1988 International Congress on Noise as a Public Health Problem, most studies attempting to clarify such health effects did not find them at levels below the criteria protective of noise-induced hearing loss, and even above these criteria, results regarding such health effects were ambiguous. Consequently, one comes to the conclusion that establishing and enforcing exposure levels protecting against noise-induced hearing loss would not only solve the noise-induced hearing loss problem but also any potential nonauditory health effects in the work place." (Reference A10; parenthetical wording added for clarification.)

Although these findings were directed specifically at noise effects in the work place, they are equally applicable to aircraft noise effects in the community environment. Research studies regarding the nonauditory health effects of aircraft noise are ambiguous, at best, and often contradictory. Yet, even those studies which purport to find such health effects use time-average noise levels of 75 dB and higher for their research.

For example, in an often-quoted paper, two UCLA researchers apparently found a relation between aircraft noise levels under the approach path to Los Angeles International Airport (LAX) and increased mortality rates among the exposed residents by using an average noise exposure level greater than 75 dB for the "noise-exposed" population (Reference A11). Nevertheless, three other UCLA professors analyzed those same data and found no relation between noise exposure and mortality rates (Reference A12).

As a second example, two other UCLA researchers used this same population near LAX to show a higher rate of birth defects in 1970–1972 when compared with a control group residing away from the airport (Reference A13). Based on this report, a separate group at the U.S. Centers for Disease Control performed a more thorough study of populations near Atlanta's Hartsfield International Airport (ATL) for 1970–1972 and found no relation in their study of 17 identified categories of birth defects to aircraft noise levels above 65 dB (Reference A14).

In summary, there is no scientific basis for a claim that potential health effects exist for aircraft time-average sound levels below 75 dB.

A.2.3 Annoyance

The primary effect of aircraft noise on exposed communities is one of annoyance. Noise annoyance is defined by the U.S. Environmental Protection Agency as any negative subjective reaction on the part of an individual or group (Reference A3). As noted in the discussion of Day-Night Average Sound Level above, community annoyance is best measured by that metric.

It is often suggested that a lower Day-Night Average Sound Level, such as 60 or 55 dB, be adopted as the threshold of community noise annoyance for airport environmental analysis documents. While there is no technical reason why a lower level cannot be measured or calculated for comparison purposes, a Day-Night Average Sound Level of 65 dB:

1. provides a valid basis for comparing and assessing community noise effects,
2. represents a noise exposure level which is normally dominated by aircraft noise and not other community or nearby highway noise sources, and
3. reflects the FAA's threshold for grant-in-aid funding of airport noise mitigation projects.

The U.S. Department of Housing and Urban Development also established a Day-Night Average Sound Level standard of 65 dB for eligibility for federally guaranteed home loans.

For this environmental study, levels of Day-Night Average Sound Level equal to and greater than 65 dB were used for assessing community noise impact.

A.2.4 Speech Interference

Speech interference associated with aircraft noise is a primary cause of annoyance to individuals on the ground. The disruption of routine activities such as radio or television listening, telephone use, or family conversation gives rise to frustration and agravation. The quality of speech communication is also important in classrooms, offices, and industrial settings and can cause fatigue and vocal strain in those who attempt to communicate over the noise. Research has shown that "whenever intrusive noise exceeds approximately 60 dB indoors, there will be interference with speech communication" (Reference A5).

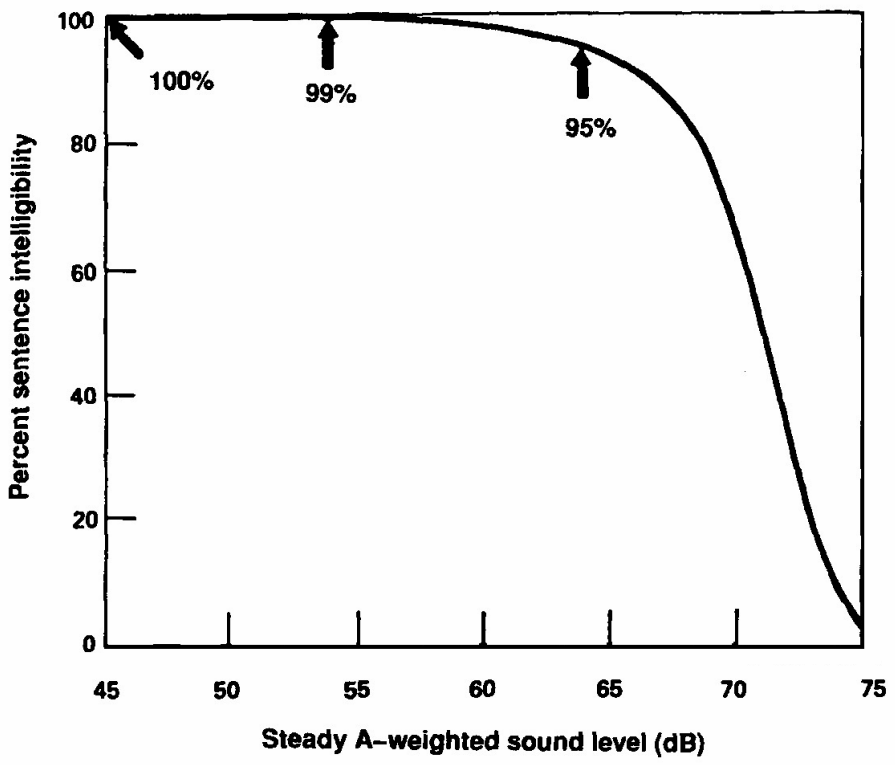


Figure A-3. Normal Voice Sentence Intelligibility as a Function of the Steady Background Sound Level in an Outdoor Situation (Reference A3)

Indoor speech interference, per Reference A3, can be expressed as a percentage of sentence intelligibility among two people speaking in relaxed conversation approximately 1 meter apart in a typical* living room or bedroom. The percentage of sentence intelligibility is a non-linear function of the (steady) indoor background A-weighted sound level as shown in Figure A-3. Sentence intelligibility is greater than 99 percent for background levels below 54 dB and less than 10 percent for background levels above 73 dB. Note that the function is especially sensitive to changes in sound level between 65 dB and 75 dB. As an example of the sensitivity, a 1 dB increase in background sound level from 70 dB to 71 dB yields a 14 percent decrease in sentence intelligibility.

* "Typical" is defined as a room with about 300 sabins of sound absorption which, according to Reference A3, is representative of living rooms and bedrooms.

A.2.5 Sleep Disturbance

Sleep disturbance is another source of annoyance associated with aircraft noise. This is especially true because of the intermittent nature and content of aircraft noise, which is more disturbing than continuous noise of equal energy and neutral meaning.

Sleep disturbance can be measured in either of two ways. "Arousal" represents awakening from sleep, while a change in "sleep stage" represents a shift from one of four sleep stages to another stage of lighter sleep without awakening. In general, arousal requires a higher noise level than does a change in sleep stage.

In terms of average daily noise levels, some guidance is available to judge sleep disturbance. The U.S. Environmental Protection Agency identified an indoor DNL of 45 dB as necessary to protect against sleep interference (Reference A3). Assuming a conservative structural noise insulation of 20 dB for typical dwellings, 45 dB corresponds to an outdoor DNL of 65 dB as minimizing sleep interference.

In June 1997, the Federal Interagency Committee on Aviation Noise (FICAN) reviewed the sleep disturbance issue and presented a sleep disturbance dose-response prediction curve (Reference A15), which was based on data from field studies in References A16 through A19, as the recommended tool for analysis of potential sleep disturbance for residential areas. Figure A-4 shows this curve which, for an indoor Sound Exposure Level of 60 dB, predicts that a maximum of approximately 5 percent of the residential populaton exposed are expected to be behaviourally awakened. FICAN cautions that this curve should only be applied to long-term adult residents.

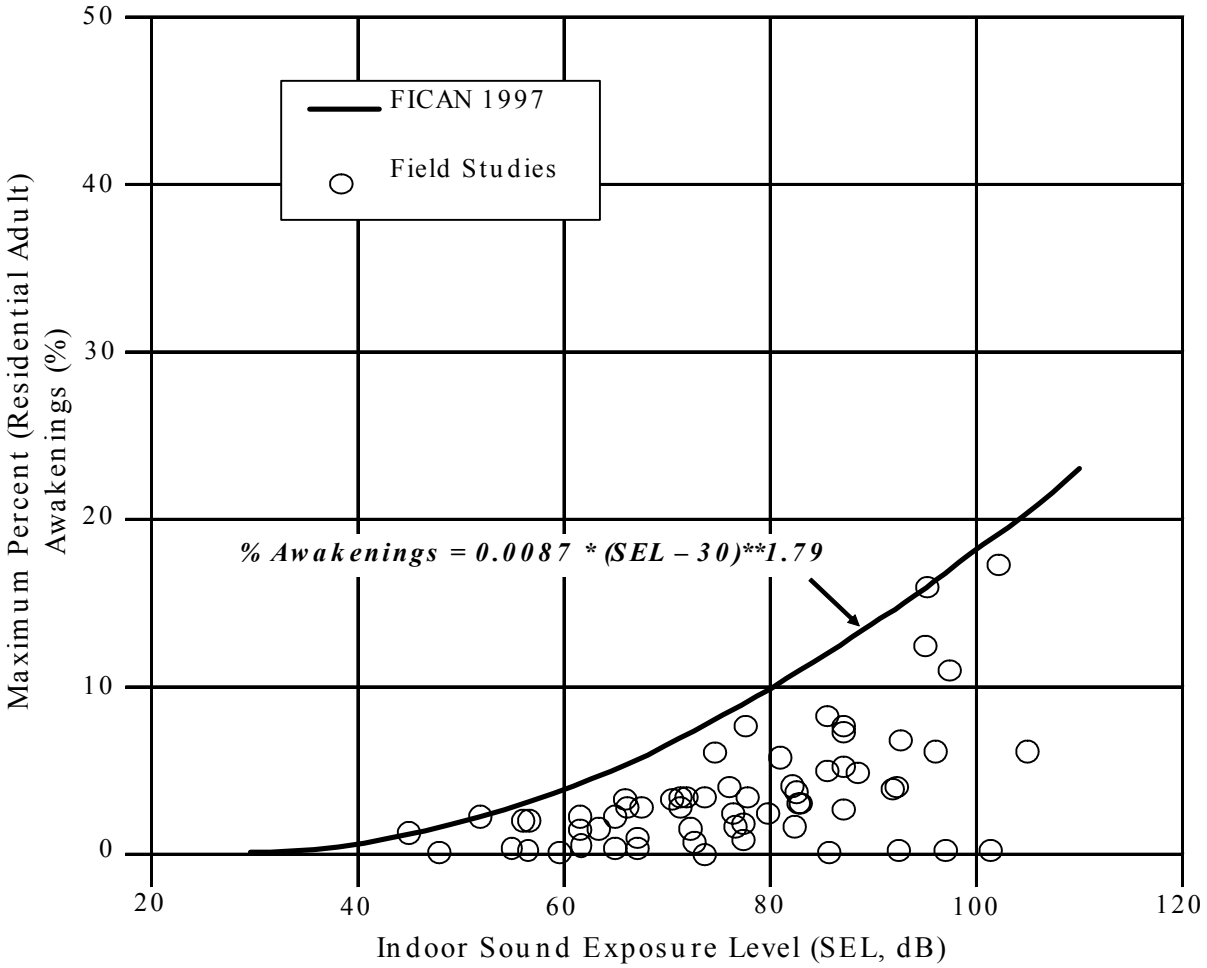


Figure A-4. Sleep-disturbance Dose-response Relationship

A.2.6 Noise Effects on Domestic Animals and Wildlife

Animal species differ greatly in their responses to noise. Each species has adapted, physically and behaviorally, to fill its ecological role in nature, and its hearing ability usually reflects that role. Animals rely on their hearing to avoid predators, obtain food, and communicate with and attract other members of their species. Aircraft noise may mask or interfere with these functions. Secondary effects may include nonauditory effects similar to those exhibited by humans – stress, hypertension, and other nervous disorders. Tertiary effects may include interference with mating and resultant population declines.

There are available many scientific studies regarding the effects of noise on wildlife and some anecdotal reports of wildlife "flight" due to noise. Few of these studies or reports include any reliable measures of the actual noise levels involved.

In the absence of definitive data on the effect of noise on animals, the Committee on Hearing, Bioacoustics, and Biomechanics of the National Research Council has proposed that protective noise criteria for animals be taken to be the same as for humans (Reference A16).

A.2.7 Effects on Noise-Induced Vibration Structures and Humans

The sound from an aircraft overflight travels from the exterior to the interior of the house in one of two ways: through the solid structural elements and directly through the air. Figure A-5 illustrates the sound transmission through a wall constructed with a brick exterior, stud framing, interior finish wall, and absorbent material in the cavity. The sound transmission starts with noise impinging on the wall exterior. Some of this sound energy will be reflected away and some will make the wall vibrate. The vibrating wall radiates sound into the airspace, which in turn sets the interior finish surface vibrating, with some energy lost in the airspace. This surface then radiates sound into the dwelling interior. As the figure shows, vibrational energy also bypasses the air cavity by traveling through the studs and edge connections.

Normally, the most sensitive components of a structure to airborne noise are the windows and, infrequently, the plastered walls and ceilings. An evaluation of the peak sound pressures impinging on the structure is normally sufficient to determine the possibility of damage. In general, at sound levels above 130 dB, there is the possibility of structural damage. While certain frequencies (such as 30 hertz for window breakage) may be of more concern than other frequencies, conservatively, only sounds lasting more than one second above a sound level of 130 dB are potentially damaging to structural components (Reference A20).

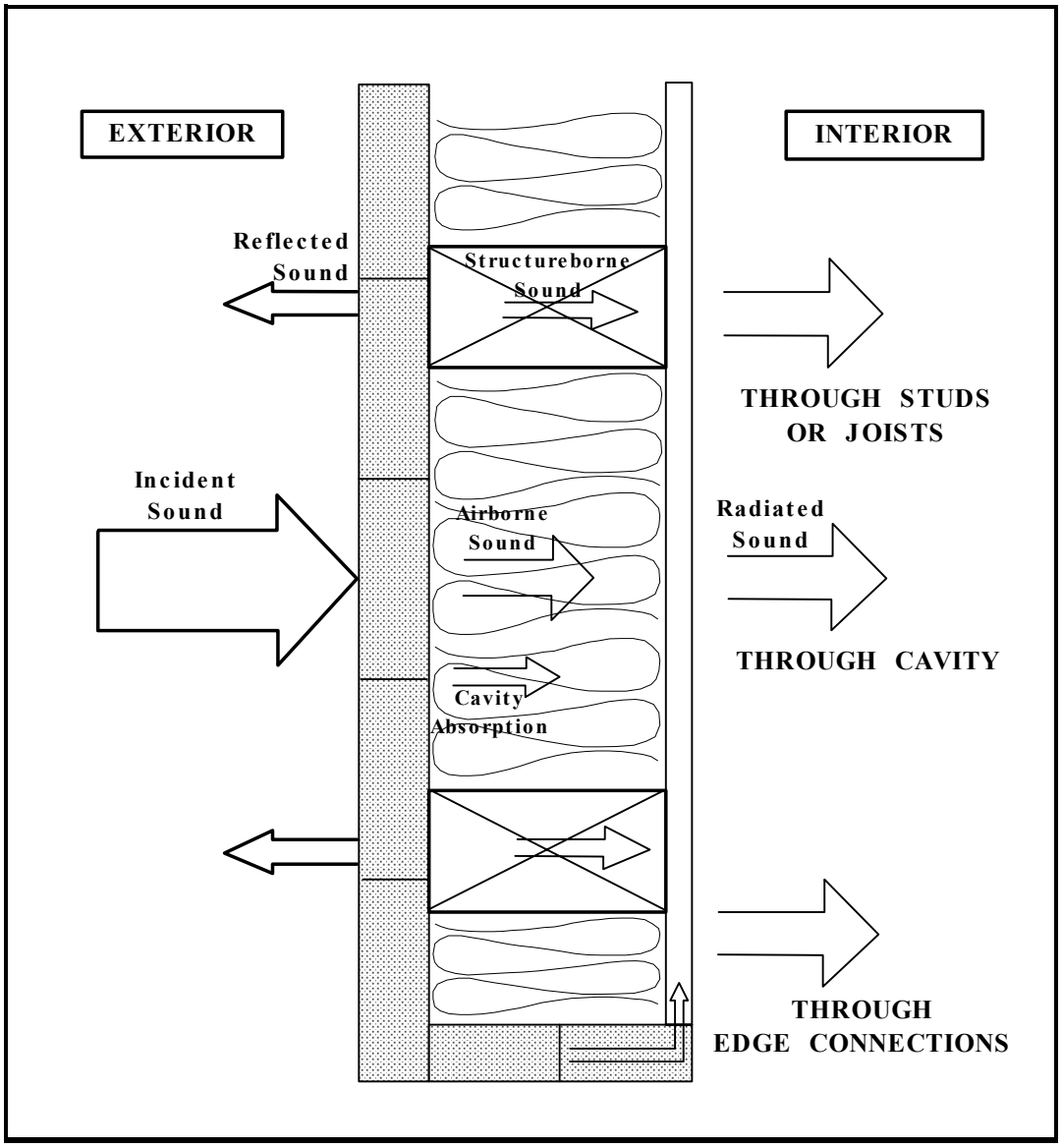


Figure A-5. Pictorial Representation of Sound Transmission Through Built Construction

In terms of average acceleration of wall or ceiling vibration, the thresholds for structural damage (Reference A21) are:

- 0.5 m/s/s – is the threshold of risk of damage to sensitive structures (i.e., ancient monuments, etc.).
- 1.0 m/s/s – is the threshold of risk of damage to normal dwellings (i.e., houses with plaster ceiling and walls).

Noise-induced structural vibration may also cause annoyance to dwelling occupants because of induced secondary vibrations, or "rattle", of objects within the dwelling – hanging pictures, dishes, plaques, and bric-a-brac. Loose window panes may also vibrate noticeably when exposed to high levels of airborne noise, causing homeowners to fear breakage. In general, such noise-induced vibrations occur at sound levels above those considered normally compatible with residential land use. Thus assessments of noise exposure levels for compatible land use should also be protective of noise-induced secondary vibrations.

In the assessment of vibration on humans, the following factors determine if a person will perceive and possibly react to building vibrations:

1. Type of excitation: steady state, intermittent, or impulsive vibration.
2. Frequency of the excitation. ISO 2631-2 (Reference A21) recommends a frequency range of 1 to 80 Hz for the assessment of vibration on humans.
3. Orientation of the body with respect to the vibration.
4. The use of the occupied space (i.e., residential, workshop, hospital).
5. Time of day.

Table A-1 lists the whole-body vibration criteria from Reference A21 for one-third octave frequency bands from 1 to 80 Hz.

Table A-1

Vibration Criteria for the Evaluation of Human Exposure to Whole-Body Vibration

Frequency (Hz)	RMS Acceleration (m/s/s)		
	Combined Criteria Base Curve	Residential Night	Residential Day
1	0.0036	0.0050	0.0072
1.25	0.0036	0.0050	0.0072
1.6	0.0036	0.0050	0.0072
2	0.0036	0.0050	0.0072
2.5	0.0037	0.0052	0.0074
3.15	0.0039	0.0054	0.0077
4	0.0041	0.0057	0.0081
5	0.0043	0.0060	0.0086
6.3	0.0046	0.0064	0.0092
8	0.0050	0.0070	0.0100
10	0.0063	0.0088	0.0126
12.5	0.0078	0.0109	0.0156
16	0.0100	0.0140	0.0200
20	0.0125	0.0175	0.0250
25	0.0156	0.0218	0.0312
31.5	0.0197	0.0276	0.0394
40	0.0250	0.0350	0.0500
50	0.0313	0.0438	0.0626
63	0.0394	0.0552	0.0788
80	0.0500	0.0700	0.1000

Source: Reference A21.

A.2.8 Noise Effects on Terrain

It has been suggested that noise levels associated with low-flying aircraft may affect the terrain under the flight path by disturbing fragile soil or snow structures, especially in mountainous areas, causing landslides or avalanches. There are no known instances of such effects, and it is considered improbable that such effects will result from routine, subsonic aircraft operations.

A.2.9 Noise Effects on Historical and Archaeological Sites

Because of the potential for increased fragility of structural components of historical buildings and other historical sites, aircraft noise may affect such sites more severely than newer, modern structures. Again, there are few scientific studies of such effects to provide guidance for their assessment.

One study involved the measurements of sound levels and structural vibration levels in a superbly restored plantation house, originally built in 1795, and now situated approximately 1,500 feet from the centerline at the departure end of Runway 19L at Washington Dulles International Airport (IAD). These measurements were made in connection with the proposed scheduled operation of the supersonic Concorde airplane at Dulles (Reference A22). There was special concern for the building's windows, since roughly half of the 324 panes were original. No instances of structural damage were found. Interestingly, despite the high levels of noise during Concorde takeoffs, the induced structural vibration levels were actually less than those induced by touring groups and vacuum cleaning.

As noted above for the noise effects of noise-induced vibrations of normal structures, assessments of noise exposure levels for normally compatible land uses should also be protective of historic and archaeological sites.

A.3 REFERENCES

A1. "Sound Level Descriptors for Determination of Compatible Land Use," American National Standards Institute Standard ANSI S3.23-1980.

A2. "Quantities and Procedures for Description and Measurement of Environmental Sound, Part 1," American National Standards Institute Standard ANSI S12.9-1988.

A3. "Information on Levels of Environmental Noise Requisite to Protect the Public Health and Welfare With an Adequate Margin of Safety," U.S. Environmental Protection Agency Report 550/9-74-004, March 1974.

A4. "Guidelines for Considering Noise in Land-Use Planning and Control," Federal Interagency Committee on Urban Noise, June 1980.

A5. "Federal Agency Review of Selected Airport Noise Analysis Issues," Federal Interagency Committee on Noise, August 1992.

A6. Schultz, T.J., "Synthesis of Social Surveys on Noise Annoyance," *J. Acoust. Soc. Am.*, *64*, 377-405, August 1978.

A7. Fidell, S., Barger, D.S., and Schultz, T.J., "Updating a Dosage-Effect Relationship for the Prevalence of Annoyance Due to General Transportation Noise," *J. Acoust. Soc. Am.*, *89*, 221-233, January 1991.

A8. "Community Reactions to Helicopter Noise: Results From an Experimental Study," *J. Acoust. Soc. Am.*, *82*, 479-492, August 1987.

A9. Stusnick, E., and Bradley, K.A., "The Effect of Onset Rate on Aircraft Noise Annoyance. Volume 2: Rented Home Experiment", AL/OE-TR-1993-0170, October 1992.

A10. von Gierke, H.R., "The Noise-Induced Hearing Loss Problem", NIH Consensus Development Conference on Noise and Hearing Loss, Washington, D.C., 22–24 January 1990.

A11. Meacham, W.C., and Shaw, N., "Effects of Jet Noise on Mortality Rates," *British J. Audiology*, 77-80, August 1979.

A12. Frericks, R.R., *et al.*, "Los Angeles Airport Noise and Mortality: Faulty Analysis and Public Policy," *Am. J. Public Health*, 357-362, April 1980.

A13. Jones, F.N., and Tauscher, J., "Residence Under an Airport Landing Pattern as a Factor in Teratism", *Archives of Environmental Health*, 10-12, January/ February 1978.

A14. Edmonds, L.D., *et al.*, "Airport Noise and Teratogenesis," *Archives of Environmental Health*, 243-247, July/August 1979.

A15. "Federal Interagency Committee on Aviation Noise (FICAN) Effects of Aviation Noise on Awakenings From Sleep", June 1997.

A16. National Academy of Sciences, The National Research Council, Committee on Hearing, Bioacoustics and Biomechanics, "Guidelines for Preparing Environmental Impact Statements on Noise", 1977.

A17. Ollerhead, J.B., Jones, C.J., Cadous, R.E., Woodley, A., Atkinson, B.J., Horne, J.A., Pankhurst, F., Reyner, L., Hume, K.I., Van, F., Watson, A., Diamond, I.D., Egger, P., Holmes, D., and McKean, J., *Report of a Field Study of Aircraft Noise and Sleep Disturbance*, London: Department of Safety, Environment and Engineering, 1992.

A18. Fidell, S., Pearsons, K., Howe, R., Tabachnick, B., Silvati, L., and Barber, D.S., "Noise-Induced Sleep Disturbance in Residential Settings", AL/OE-TR-1994-0131, Wright Patterson AFB, OH, Armstrong Laboratory, Occupational & Environmental Health Division, 1994.

A19. Fidell, S., Howe, R., Tabachnick, B., Pearsons, K., and Sneddon, M., "Noise-Induced Sleep Disturbance in Residences Near Two Civil Airports", Langley Research Center, 1995.

A20. von Gierke, H.E., and Ward, W.D., "Criteria for Noise and Vibration Exposure", *Handbook of Acoustical Measurements and Noise Control*, Third Edition, 1991.

A21. "Evaluation of Human Exposure to Whole-Body Vibration – Part 2: Continuous and Shock-Induced Vibration in Buildings (1 to 80 Hz)", International Organization for Standardization, Standard 2631-2, February 1989.

A22. Wesler, J.E., "Concorde Operations At Dulles International Airport," NOISEXPO '77, Chicago, IL, March 1977.

E. Fair Disclosure Statement Example

FAIR DISCLOSURE STATEMENT

For Property in

Air Installations Compatible Use Zones

The property at the following location:

Parcel #: _____
Deed Book # _____ Page # _____
Address _____

Is situated within the following zones of the Air Installations Compatible Use Zones (AICUZ) of the Naval Air Station (NAS) Key West, Florida.

___ Clear Zone (CZ): Greatest potential of accidents
___ Accident Potential Zone I (APZ I): Significant potential for accidents
___ Accident Potential Zone II (APZ II): Measurable potential for accidents
___ Noise Exposure Level N3: (75 Ldn or higher): Area of significant impact from noise.
___ Noise Exposure Level N2: (65 Ldn to 74 Ldn): Area of moderate impact from noise.
___ Noise Exposure Level N1: (64 Ldn or lower): Area of some impact from noise.

This City/County has placed certain use restrictions on the development of the property within the NAS Key West AICUZ footprint. Before purchasing the above property, you should consult the City/County Planning Department to determine what restrictions have been placed on the subject property. For properties identified as being within Noise Exposure Level Zones, the City/County provides information for methods to reduce noise levels for existing or planned development.

I, _____. Owner of the subject property, hereby certify that I have informed _____, perspective purchaser/lessee/renter, that the subject property is located in an Air Installation Compatible Use Zone.

_____ _____
Owner *Purchaser/Lessee/Renter*

_____ _____
Owner *Purchaser/Lessee/Renter*

Signed before me this _____ day of _____, 20 ___, in the County/ City of _____, Florida

_____, Notary Public, State of Florida. *Seal*

My Commission Expires on _____.

F. Section 163.3175, Florida Statutes, 2004

- Legislative finding on compatibility of development with military installation; exchange of information between state and local governments and military installation.

An act relating to military affairs; creating s. 163.3175, F.S.; providing legislative findings on the compatibility of development with military installations; providing for the exchange of information relating to proposed land use decisions between counties and local governments and military installations; providing for responsive comments by the commanding officer or his or her designee; providing for the county or affected local government to take such comments into consideration; providing for a representative of the military installation to be an ex-officio, nonvoting member of the county's or local government's land planning or zoning board; encouraging the commanding officer to provide information on community planning assistance grants; providing definitions; amending s. 163.3177, F.S.; providing for the future land use plan element of comprehensive plans to include compatibility with military installations; requiring the inclusion of criteria; requiring local governments to update or amend their comprehensive plan by a certain date; providing for the coordination by the state land planning agency and the Department of Defense on compatibility issues for military installations; amending s. 163.3187, F.S.; providing that amendments to address compatibility or include criteria do not count

toward the limitation on frequency of amending comprehensive plans; amending s. 163.3191, F.S.; providing that evaluations of comprehensive plans include whether such criteria were successful in resolving land use compatibility uses with military installations; amending s. 288.980, F.S.; creating the Defense Infrastructure Grant Program; providing the purpose and for implementation of the program; amending s. 295.01, F.S.; revising certain requirements relating to scholarships for children of deceased veterans; amending s. 443.101, F.S.; providing eligibility for unemployment compensation benefits for the spouses of a member of the military under certain circumstances beginning on a date certain; amending s. 445.007, F.S.; providing for the appointment of a military representative to certain regional workforce boards; amending s. 464.009, F.S.; removing a scheduled repeal of provisions; providing for licensure by endorsement of certain nurses licensed in another state that is a member of the Nurse Licensure Compact; amending s. 464.022, F.S.; providing that certain nurses relocating to this state may perform nursing services for a period of 120 days after submitting application for licensure; amending s. 1002.39, F.S.; revising eligibility requirements for military dependents applying for a John M. McKay Scholarship; requiring the

State Board of Education to adopt rules; amending s. 1003.05, F.S.; directing the Department of Education to assist in the development of memoranda of agreement between school districts and military installations; providing that qualifying military dependents receive priority admission to certain special academic programs; creating s. 1008.221, F.S.; providing for alternate assessments for the grade 10 FCAT for certain military dependents; amending s. 1009.21, F.S.; classifying dependents of active duty members of the armed forces and certain liaison officers and their spouses and dependent children as residents for tuition purposes; directing Workforce Florida, Inc., to establish an employment advocacy and assistance program targeting military spouses and dependents; directing the Florida Housing Finance Corporation to assess the housing needs of Florida's military families; requiring a report; providing an effective date.

Be It Enacted by the Legislature of the State of Florida:

Section 1. Section 163.3175, Florida Statutes, is created to read:

<u>163.3175 Legislative findings on compatibility of development with military installations; exchange of information between local governments and military installations.--</u>

CODING: Words ~~stricken~~ are deletions; words <u>underlined</u> are additions.

(1) The Legislature finds that incompatible development of land close to military installations can adversely affect the ability of such an installation to carry out its mission. The Legislature further finds that such development also threatens the public safety because of the possibility of accidents occurring within the areas surrounding a military installation. In addition, the economic vitality of a community is affected when military operations and missions must relocate because of incompatible urban encroachment. Therefore, the Legislature finds it desirable for the local governments in the state to cooperate with military installations to encourage compatible land use, help prevent incompatible encroachment, and facilitate the continued presence of major military installations in this state.

(2) Each county in which a military installation is either wholly or partially located and each affected local government must transmit to the commanding officer of that installation information relating to proposed changes to comprehensive plans, plan amendments, and proposed changes to land development regulations which, if approved, would affect the intensity, density, or use of the land adjacent to or in close proximity to the military installation. Each county and affected local government shall provide the military installation an opportunity to review and comment on the proposed changes.

(3) The commanding officer or his or her designee may provide comments to the county or affected local government on the impact such proposed changes may have on the mission of the military installation. Such comments may include:

(a) If the installation has an airfield, whether such proposed changes will be incompatible with the safety and noise standards contained in the Air Installation Compatible Use Zone (AICUZ) adopted by the military installation for that airfield;

(b) Whether such changes are incompatible with the Installation Environmental Noise Management Program (IENMP) of the United States Army;

(c) Whether such changes are incompatible with the findings of a Joint Land Use Study (JLUS) for the area if one has been completed; and

(d) Whether the military installation's mission will be adversely affected by the proposed actions of the county or affected local government.

(4) The county or affected local government shall take into consideration any comments provided by the commanding officer or his or her designee when making such decision regarding comprehensive planning or land development regulation. The county or affected local government shall forward a copy of any such comments to the state land planning agency.

(5) To facilitate the exchange of information provided for in this section, a representative of a military installation acting on behalf of all military installations within that jurisdiction shall be included as an exofficio, nonvoting member of the county's or affected local government's land planning or zoning board.

(6) The commanding officer is encouraged to provide information about any community planning assistance grants that may be available to a county or affected local government through the federal Office of Economic Adjustment as an

incentive for communities to participate in a joint planning process that would facilitate the compatibility of community planning and the activities and mission of the military installation.

(7) As used in this section, the term:

(a) "Affected local government" means a municipality adjacent to or in close proximity to the military installation as determined by the state land planning agency.

(b) "Military installation" means a base, camp, post, station, airfield, yard, center, home port facility for any ship, or other land area under the jurisdiction of the Department of Defense, including any leased facility. Such term does not include any facility used primarily for civil works, rivers and harbors projects, or flood control projects.

Section 2. Paragraph (a) of subsection (6) and paragraph (l) of subsection (10) of section 163.3177, Florida Statutes, are amended to read:

163.3177 Required and optional elements of comprehensive plan; studies and surveys.--

(6) In addition to the requirements of subsections (1)-(5), the comprehensive plan shall include the following elements:

(a) A future land use plan element designating proposed future general distribution, location, and extent of the uses of land for residential uses, commercial uses, industry, agriculture, recreation, conservation, education, public buildings and grounds, other public facilities, and other categories of the public and private uses of land. Each future land use category must be defined in terms of uses included, and must include standards to be followed in the control and distribution of population densities and building

and structure intensities. The proposed distribution, location, and extent of the various categories of land use shall be shown on a land use map or map series which shall be supplemented by goals, policies, and measurable objectives. The future land use plan shall be based upon surveys, studies, and data regarding the area, including the amount of land required to accommodate anticipated growth; the projected population of the area; the character of undeveloped land; the availability of public services; the need for redevelopment, including the renewal of blighted areas and the elimination of nonconforming uses which are inconsistent with the character of the community; the compatibility of uses on lands adjacent to or closely proximate to military installations; and, in rural communities, the need for job creation, capital investment, and economic development that will strengthen and diversify the community's economy. The future land use plan may designate areas for future planned development use involving combinations of types of uses for which special regulations may be necessary to ensure development in accord with the principles and standards of the comprehensive plan and this act. The future land use plan element shall include criteria to be used to achieve the compatibility of adjacent or closely proximate lands with military installations. In addition, for rural communities, the amount of land designated for future planned industrial use shall be based upon surveys and studies that reflect the need for job creation, capital investment, and the necessity to strengthen and diversify the local economies, and shall not be limited solely by the projected population of the rural community. The future land use plan of a county may also designate areas for possible future municipal incorporation. The land use maps or map

series shall generally identify and depict historic district boundaries and shall designate historically significant properties meriting protection. The future land use element must clearly identify the land use categories in which public schools are an allowable use. When delineating the land use categories in which public schools are an allowable use, a local government shall include in the categories sufficient land proximate to residential development to meet the projected needs for schools in coordination with public school boards and may establish differing criteria for schools of different type or size. Each local government shall include lands contiguous to existing school sites, to the maximum extent possible, within the land use categories in which public schools are an allowable use. All comprehensive plans must comply with the school siting requirements of this paragraph no later than October 1, 1999. The failure by a local government to comply with these school siting requirements by October 1, 1999, will result in the prohibition of the local government's ability to amend the local comprehensive plan, except for plan amendments described in s. 163.3187(1)(b), until the school siting requirements are met. Amendments proposed by a local government for purposes of identifying the land use categories in which public schools are an allowable use or for adopting or amending the school-siting maps pursuant to s. 163.31776(3) are exempt from the limitation on the frequency of plan amendments contained in s. 163.3187. The future land use element shall include criteria that encourage the location of schools proximate to urban residential areas to the extent possible and shall require that the local government seek to collocate public facilities, such as parks, libraries, and community centers,

with schools to the extent possible and to encourage the use of elementary schools as focal points for neighborhoods. For schools serving predominantly rural counties, defined as a county with a population of 100,000 or fewer, an agricultural land use category shall be eligible for the location of public school facilities if the local comprehensive plan contains school siting criteria and the location is consistent with such criteria. Local governments required to update or amend their comprehensive plan to include criteria and address compatibility of adjacent or closely proximate lands with existing military installations in their future land use plan element shall transmit the update or amendment to the department by June 30, 2006.

(10) The Legislature recognizes the importance and significance of chapter 9J-5, Florida Administrative Code, the Minimum Criteria for Review of Local Government Comprehensive Plans and Determination of Compliance of the Department of Community Affairs that will be used to determine compliance of local comprehensive plans. The Legislature reserved unto itself the right to review chapter 9J-5, Florida Administrative Code, and to reject, modify, or take no action relative to this rule. Therefore, pursuant to subsection (9), the Legislature hereby has reviewed chapter 9J-5, Florida Administrative Code, and expresses the following legislative intent:

(l) The state land planning agency shall consider land use compatibility issues in the vicinity of all airports in coordination with the Department of Transportation and adjacent to or in close proximity to all military installations in coordination with the Department of Defense.

Section 3. Paragraph (m) is added to subsection (1) of section 163.3187, Florida Statutes, to read:

163.3187 Amendment of adopted comprehensive plan.--

(1) Amendments to comprehensive plans adopted pursuant to this part may be made not more than two times during any calendar year, except:

(m) A comprehensive plan amendment that addresses criteria or compatibility of land uses adjacent to or in close proximity to military installations in a local government's future land use element does not count toward the limitation on the frequency of the plan amendments.

Section 4. Paragraph (n) is added to subsection (2) of section 163.3191, Florida Statutes, to read:

163.3191 Evaluation and appraisal of comprehensive plan.--

(2) The report shall present an evaluation and assessment of the comprehensive plan and shall contain appropriate statements to update the comprehensive plan, including, but not limited to, words, maps, illustrations, or other media, related to:

(n) An assessment of whether the criteria adopted pursuant to s. 163.3177(6)(a) was successful in achieving compatibility with military installations.

Section 5. Present subsections (4), (5), (6), (7), and (8) of section 288.980, Florida Statutes, are renumbered as subsections (5), (6), (7), (8), and (9), respectively, and a new subsection (4) is added to that section to read:

288.980 Military base retention; legislative intent; grants program.--

(4) The Defense Infrastructure Grant Program is created. The director of the Office of Tourism, Trade, and

Economic Development shall coordinate and implement this program, the purpose of which is to support local infrastructure projects deemed to have a positive impact on the military value of installations within the state. Funds are to be used for projects that benefit both the local community and the military installation. It is not the intent, however, to fund on-base military construction projects. Infrastructure projects to be funded under this program include, but are not limited to, those related to encroachment, transportation and access, utilities, communications, housing, environment, and security. Grant requests will be accepted only from economic development applicants serving in the official capacity of a governing board of a county, municipality, special district, or state agency that will have the authority to maintain the project upon completion. An applicant must represent a community or county in which a military installation is located. There is no limit as to the amount of any grant awarded to an applicant. A match by the county or local community may be required. The Office of Tourism, Trade, and Economic Development shall establish guidelines to implement the purpose of this subsection.

Section 6. Subsection (1) of section 295.01, Florida Statutes, is amended to read:

295.01 Children of deceased or disabled veterans; education.--

(1) It is hereby declared to be the policy of the state to provide educational opportunity at state expense for dependent children either of whose parents was a resident of the state at the time such parent entered the Armed Forces and:

(a) Died as a result of service-connected injuries, disease, or disability sustained while on active duty; ~~in that service or from injuries sustained or disease contracted during a period of wartime service as defined in s. 1.01(14) or has died since or may hereafter die from diseases or disability resulting from such war service,~~ or

(b) Has been:

1. Determined by the United States Department of Veterans Affairs or its predecessor to have a service-connected 100-percent total and permanent disability rating for compensation; ~~,~~

2. Determined to have a service-connected total and permanent disability rating of 100 percent and is in receipt of disability retirement pay from any branch of the United States Armed Services; ~~,~~ or

3. Issued a valid identification card by the Department of Veterans' Affairs in accordance with s. 295.17,

when the parents of such children have been bona fide residents of the state for 5 years next preceding their application for the benefits hereof, and subject to the rules, restrictions, and limitations hereof.

Section 7. Paragraph (a) of subsection (1) of section 443.101, Florida Statutes, is amended to read:

443.101 Disqualification for benefits.--An individual shall be disqualified for benefits:

(1)(a) For the week in which he or she has voluntarily left his or her work without good cause attributable to his or her employing unit or in which the individual has been discharged by his or her employing unit for misconduct connected with his or her work, based on a finding by the

Agency for Workforce Innovation. As used in this paragraph, the term "work" means any work, whether full-time, part-time, or temporary.

1. Disqualification for voluntarily quitting continues for the full period of unemployment next ensuing after he or she has left his or her full-time, part-time, or temporary work voluntarily without good cause and until the individual has earned income equal to or in excess of 17 times his or her weekly benefit amount. As used in this subsection, the term "good cause" includes only that cause attributable to the employing unit or which consists of illness or disability of the individual requiring separation from his or her work. Any other disqualification may not be imposed. An individual is not disqualified under this subsection for voluntarily leaving temporary work to return immediately when called to work by the permanent employing unit that temporarily terminated his or her work within the previous 6 calendar months. For benefit years beginning on or after July 1, 2004, an individual is not disqualified under this subsection for voluntarily leaving work to relocate as a result of his or her military-connected spouse's permanent change of station orders, activation orders, or unit deployment orders.

2. Disqualification for being discharged for misconduct connected with his or her work continues for the full period of unemployment next ensuing after having been discharged and until the individual has become reemployed and has earned income of at least 17 times his or her weekly benefit amount and for not more than 52 weeks that immediately follow that week, as determined by the Agency for Workforce Innovation in each case according to the circumstances in each case or the seriousness of the misconduct, under the agency's

rules adopted for determinations of disqualification for benefits for misconduct.

Section 8. Subsection (1) of section 445.007, Florida Statutes, is amended to read:

445.007 Regional workforce boards; exemption from public meetings law.--

(1) One regional workforce board shall be appointed in each designated service delivery area and shall serve as the local workforce investment board pursuant to Pub. L. No. 105-220. The membership of the board shall be consistent with Pub. L. No. 105-220, Title I, s. 117(b), and contain one representative from a nonpublic postsecondary educational institution that is an authorized individual training account provider within the region and confers certificates and diplomas, one representative from a nonpublic postsecondary educational institution that is an authorized individual training account provider within the region and confers degrees, and three representatives of organized labor. The board shall include one representative from a military installation if a military installation is located within the region. Individuals serving as members of regional workforce development boards or local WAGES coalitions, as of June 30, 2000, are eligible for appointment to regional workforce boards, pursuant to this section. It is the intent of the Legislature that, whenever possible and to the greatest extent practicable, membership of a regional workforce board include persons who are current or former recipients of welfare transition assistance as defined in s. 445.002(3) or workforce services as provided in s. 445.009(1), or that such persons be included as ex officio members of the board or of committees organized by the board. The importance of minority and gender

representation shall be considered when making appointments to the board. If the regional workforce board enters into a contract with an organization or individual represented on the board of directors, the contract must be approved by a two-thirds vote of the entire board, and the board member who could benefit financially from the transaction must abstain from voting on the contract. A board member must disclose any such conflict in a manner that is consistent with the procedures outlined in s. 112.3143.

Section 9. Subsection (1) of section 464.009, Florida Statutes, is amended, present subsections (3), (4), and (5) of that section are redesignated as subsections (4), (5), and (6), respectively, and a new subsection (3) is added to that section, to read:

464.009 Licensure by endorsement.--

(1) The department shall issue the appropriate license by endorsement to practice professional or practical nursing to an applicant who, upon applying to the department and remitting a fee set by the board not to exceed $100, demonstrates to the board that he or she:

(a) Holds a valid license to practice professional or practical nursing in another state or territory of the United States, provided that, when the applicant secured his or her original license, the requirements for licensure were substantially equivalent to or more stringent than those existing in Florida at that time;

(b) Meets the qualifications for licensure in s. 464.008 and has successfully completed a state, regional, or national examination which is substantially equivalent to or more stringent than the examination given by the department; or

(c) Has actively practiced nursing in another state, jurisdiction, or territory of the United States for 2 of the preceding 3 years without having his or her license acted against by the licensing authority of any jurisdiction. Applicants who become licensed pursuant to this paragraph must complete within 6 months after licensure a Florida laws and rules course that is approved by the board. Once the department has received the results of the national criminal history check and has determined that the applicant has no criminal history, the appropriate license by endorsement shall be issued to the applicant. ~~This paragraph is repealed July 1, 2004, unless reenacted by the Legislature.~~

(3) An applicant for licensure by endorsement who is relocating to this state pursuant to his or her military-connected spouse's official military orders and who is licensed in another state that is a member of the Nurse Licensure Compact shall be deemed to have satisfied the requirements of subsection (1) and shall be issued a license by endorsement upon submission of the appropriate application and fees and completion of the criminal background check required under subsection (4).

Section 10. Subsection (8) of section 464.022, Florida Statutes, is amended to read:

464.022 Exceptions.--No provision of this part shall be construed to prohibit:

(8) Any nurse currently licensed in another state or territory of the United States from performing nursing services in this state for a period of 60 days after furnishing to the employer satisfactory evidence of current licensure in another state or territory and having submitted proper application and fees to the board for licensure prior

to employment. If the nurse licensed in another state or territory is relocating to this state pursuant to his or her military-connected spouse's official military orders, this period shall be 120 days after furnishing to the employer satisfactory evidence of current licensure in another state or territory and having submitted proper application and fees to the board for licensure prior to employment. The board may extend this time for administrative purposes when necessary.

Section 11. Subsections (2) and (8) of section 1002.39, Florida Statutes, are amended to read:

1002.39 The John M. McKay Scholarships for Students with Disabilities Program.--There is established a program that is separate and distinct from the Opportunity Scholarship Program and is named the John M. McKay Scholarships for Students with Disabilities Program, pursuant to this section.

(2) SCHOLARSHIP ELIGIBILITY.--The parent of a public school student with a disability who is dissatisfied with the student's progress may request and receive from the state a John M. McKay Scholarship for the child to enroll in and attend a private school in accordance with this section if:

(a) By assigned school attendance area or by special assignment, the student has spent the prior school year in attendance at a Florida public school. Prior school year in attendance means that the student was enrolled and reported by a school district for funding during the preceding October and February Florida Education Finance Program surveys in kindergarten through grade 12. However, this paragraph does not apply to a dependent child of a member of the United States Armed Forces who transfers to a school in this state from out of state or from a foreign country pursuant to a parent's permanent change of station orders. A dependent child

of a member of the United States Armed Forces who transfers to a school in this state from out of state or from a foreign country pursuant to a parent's permanent change of station orders must meet all other eligibility requirements to participate in the program.

(b) The parent has obtained acceptance for admission of the student to a private school that is eligible for the program under subsection (4) and has notified the school district of the request for a scholarship at least 60 days prior to the date of the first scholarship payment. The parental notification must be through a communication directly to the district or through the Department of Education to the district in a manner that creates a written or electronic record of the notification and the date of receipt of the notification.

This section does not apply to a student who is enrolled in a school operating for the purpose of providing educational services to youth in Department of Juvenile Justice commitment programs. For purposes of continuity of educational choice, the scholarship shall remain in force until the student returns to a public school or graduates from high school. However, at any time, the student's parent may remove the student from the private school and place the student in another private school that is eligible for the program under subsection (4) or in a public school as provided in subsection (3).

(8) RULES.--The State Board of Education shall ~~may~~ adopt rules pursuant to ss. 120.536(1) and 120.54 to administer this section, including rules that school districts must use to expedite the development of a matrix of services

based on a current individual education plan from another state or a foreign country for a transferring student with a disability who is a dependent child of a member of the United States Armed Forces. The rules must identify the appropriate school district personnel who must complete the matrix of services. For purposes of these rules, a transferring student with a disability is one who was previously enrolled as a student with a disability in an out-of-state or an out-of-country public or private school or agency program and who is transferring from out of state or from a foreign country pursuant to a parent's permanent change of station orders. However, the inclusion of eligible private schools within options available to Florida public school students does not expand the regulatory authority of the state, its officers, or any school district to impose any additional regulation of private schools beyond those reasonably necessary to enforce requirements expressly set forth in this section.

Section 12. Subsection (2) of section 1003.05, Florida Statutes, is amended, and subsection (3) is added to that section to read:

1003.05 Assistance to transitioning students from military families.--

(2) The Department of Education shall facilitate the development and implementation of memoranda of agreement between school districts and military installations which address strategies for assisting students who are the children of active-duty military personnel in the transition to Florida schools. ~~identify its efforts and strategies for assisting military connected students in transitioning to the Florida school system, including the identification of acceptable~~

~~equivalence for curriculum and graduation requirements, and report its findings to the Governor, the President of the Senate, and the Speaker of the House of Representatives by October 1, 2003.~~

(3) Dependent children of active-duty military personnel who otherwise meet the eligibility criteria for special academic programs offered through public schools shall be given first preference for admission to such programs even if the program is being offered through a public school other than the school to which the student would generally be assigned and the school at which the program is being offered has reached its maximum enrollment. If such a program is offered through a public school other than the school to which the student would generally be assigned, the parent or guardian of the student must assume responsibility for transporting the student to that school. For purposes of this subsection special academic programs include charter schools, magnet schools, advanced studies programs, advanced placement, dual enrollment, and International Baccalaureate.

Section 13. Section 1008.221, Florida Statutes, is created to read:

1008.221 Dependent children of military personnel transferring to Florida schools; equivalencies for standardized tests.--A dependent child of a member of the United States Armed Forces who enters a public school at the 12th grade from out of state or from a foreign country and provides satisfactory proof of attaining a score on an approved alternative assessment that is concordant to a passing score on the grade 10 FCAT shall satisfy the assessment requirement for a standard high school diploma as

provided in s. 1003.43(5)(a). For purposes of this section, approved alternative assessments are the SAT and ACT.

Section 14. Paragraph (b) of subsection (10) of section 1009.21, Florida Statutes, is amended, and paragraph (k) is added to that subsection, to read:

1009.21 Determination of resident status for tuition purposes.--Students shall be classified as residents or nonresidents for the purpose of assessing tuition in community colleges and state universities.

(10) The following persons shall be classified as residents for tuition purposes:

(b) Active duty members of the Armed Services of the United States and their spouses and dependents attending a public community college or state university within 50 miles of the military establishment where they are stationed, if such military establishment is within a county contiguous to Florida.

(k) Active duty members of a foreign nation's military who are serving as liaison officers and are residing or stationed in this state, and their spouses and dependent children, attending a community college or state university within 50 miles of the military establishment where the foreign liaison officer is stationed.

Section 15. (1) The Legislature finds that military families are faced with a variety of challenges, including frequent relocations, recurring deployments, lengthy periods of separation, and heightened anxiety and uncertainty during periods of conflict. A military spouse's ability to gain job skills and maintain a career contributes to the financial well-being of the family, spouse satisfaction with military life, and military retention and readiness. Military spouses

are often required to terminate their employment in order to support their spouse's highly mobile military commitment. The unemployment rate for military spouses is approximately four times the civilian unemployment rate, and military spouse earnings are significantly lower than those of their comparably educated civilian peers. Recognizing the employment challenges faced by military spouses and the importance of military families to our communities and economy, the Legislature declares its intent to establish an employment advocacy and assistance program to serve Florida's military families.

(2) Workforce Florida, Inc., shall establish an employment advocacy and assistance program targeting military spouses and dependents. This program shall deliver employment assistance services through military family employment advocates colocated within selected one-stop career centers. Persons eligible for assistance through this program shall include spouses and dependents of active-duty military personnel, Florida National Guard members, and military reservists.

(3) Military family employment advocates are responsible for providing the following services and activities:

(a) Coordination of employment assistance services through military base family support centers, Florida's one-stop career centers, and veteran-support organizations.

(b) Training to one-stop career center managers and staff on the unique employment needs and skills of military family members.

(c) Promoting and marketing the benefits of employing military family members to prospective employers.

(d) Assisting employment-seeking military family members through job counseling, job search and placement services, the dissemination of information on educational and training programs, and the availability of support services.

(e) Other employment assistance services Workforce Florida, Inc., deems necessary.

(4) Workforce Florida, Inc., may enter into agreements with public and private entities to provide services authorized under this section.

Section 16. The Florida Housing Finance Corporation shall undertake an assessment of the needs of active duty military personnel and their families living in Florida for affordable housing. The needs assessment shall provide information on the population characteristics of the service personnel and their families having total gross incomes of up to 80 percent of the local area's median income who are living off base, including, but not limited to, the number of households by family size, income, and current tenancy; the condition of existing housing; and the availability of homeowner and rental housing that is affordable to these service personnel and their families. The corporation shall report its findings and recommendations to the Governor, the President of the Senate, the Speaker of the House of Representatives, the Senate Minority Leader, and the House Minority Leader by December 31, 2004.

Section 17. This act shall take effect upon becoming a law.

City of Key West

1993 City of Key West Comprehensive Plan- Amendments, Data Inventory and Analysis, and Goals Objectives, and Policies, Florida, 1993.

2006 City of Key West Code of Ordinances, Land Development Regulations, 2006. http://www.municode.com/

Defense Mapping Agency/National Imagery and Mapping Agency

1985 Jet Navigation Chart for Greater Florida.

Globalsecurity.org

2004 http://www.globalsecurity.org

Harris Miller Miller Hanson, Inc.

1989 Aircraft Noise Survey for NAS Key West, Florida 280400.2. December 1989.

Monroe County

1988 Monroe County Code of Ordinances and Land Use District Maps, Florida, 1988.

2006 Monroe County Code of Ordinances, Land Development Regulations. http://www.municode.com/

2006 Monroe County Geographic Information System (GIS) and Tax Assessors Office Data, Florida, 1999-2006.

Naval Air Station Key West

1977 Air Installations Compatible Use Zones Study - NAS Key West, Florida

1980 NAS Key West Agreements for Areas of Boca Chica Key, 1980s and 1990s.

1980 NAS Key West Fee Acquisition Parcel Maps, Florida, 1980S.

1982 Letter of agreement, Easement Deed, April 6, 1982, NAS Key West ATC records.

1990 NAS Key West Air Traffic Control Administration, Air Activity Reports, Florida, 1990s-2006.

1992 Master Plan Update for Naval Complex Key West (Draft), Florida.

1999 Range Management Plan for Training and Management of the Patricia Target Range, Continental Shelf Associates, Inc.

2000 Naval Air Station Key West Instruction 3710.2Q, August 2000.

2001 NAS Key West Aerial Imagery, Geographic Information Systems (GIS), and Computer Aided Drafting/Design (CADD) Files, 2001-2003.

2003 NAS Key West Fee Acquisition Maps as Tabulated by NAS Key West Personnel.

2003 NAS Key West Regional Shore Infrastructure Plan (RSIP).

2004 NAS Key West AICUZ Study Update, Monroe County, Florida, 2004.

National Oceanic and Atmospheric Administration

2006 National Oceanic and Atmospheric Administration (NOAA) Miami Sectional Aeronautical Chart, 2006.

2006 National Oceanic and Atmospheric Administration (NOAA) U.S. Terminal Procedures Flip Chart for Boca Chica Field, 2006.

Naval Facilities Engineering Command

1982 Naval Facilities Engineering Command (NAVFAC) Instruction P-80.3, Airfield Safety Clearances, January, 1982.

1999 Naval Facilities Engineering Command (NAVFAC) Instruction P-971, Airfield and Heliport Planning and Design, May 1, 1999.

Naval Facilities Engineering Command South

2001 NAS Key West Airfield Safety Waivers Study, Code O4, Charleston, SC.

Office of the Chief of Naval Operations

2002 Chief of Naval Operations Instruction (OPNAVINST) 11010.36B, Air Installations Compatible Use Zones Program, December 19, 2002.

State of Florida

1985 State of Florida Local Government Comprehensive Planning and Land Development Regulation, 1985. http://www.dca.state.fl.us/fdcp/DCP/programs/index.htm

2004 Areas of Critical State Concern Program, State of Florida. http://www.dca.state.fl.us/fdcp/DCP/programs/index.htm

2004 Coastal Management Program, State of Florida. http://www.dca.state.fl.us/fdcp/DCP/programs/index.htm

URS, Inc.

2006 Key West International Airport Part 150 Study, 2004 Noise Contour Update.

Wyle Laboratories, Inc.

2002 Data Call Letter to Commander in Chief Atlantic Fleet (CLF) 5090 SER N4654A/000419 of 08, October, 2002.

2002 Wyle Laboratories, Airfield Noise Study for NAF (*NAS*) Key West, FL Existing CY01 Conditions (WR-02-19), Arlington, VA, December 2002.

2003 Wyle Laboratories, Airfield Noise Study for Forecast CY 07 Conditions at Naval Air Facility (*NAS*) Key West, FL (WR-03-02), Arlington, VA, April 2003.

University of Florida

2003 University of Florida Bureau of Economic and Business Research Populations Data.

U.S. Census Bureau

2003 Population statistics, 2003.

U.S. Geological Survey

1990 U.S. Geological Survey (USGS) 1:100,000 Scale Digital Raster Graphics, Washington, DC. 1990s.

U.S. Department of Defense

1977 U.S. Department of Defense (DOD) Instruction 4165.57, Air Installations Compatible Use Zones, November 8, 1977.

U.S. Department of Transportation

1977 U.S. Department of Transportation, Federal Highway Administration, Standard Land Use Coding Manual (SLUCM), Washington, D.C. March 1977.

1992 U.S. Department of Transportation, Federal Aviation Administration (FAA) Regulations, Code of Federal Regulations (CFR), Title 14, Part 77, Objects Affecting Navigable Airspace, 1992.

U.S. Department of Navy

2001 Navy Safety Center Official Web Site http://www.safetycenter.navy.mil/. 2001.

2003 U.S. Navy Environmental Assessment for Fleet Support and Infrastructure Improvements, Naval Air Station Key West, FL, April 2003.