AIR INSTALLATION COMPATIBLE USE ZONE (AICUZ) STUDY for Little Rock Air Force Base at Jacksonville, Arkansas

Headquarters Air Mobility Command

June 2011

ABBREVIATIONS AND ACRONYMS

18 AF	18th Air Force
19 AW	19th Airlift Wing
29 WS	29th Weapons Squadron
34 CTS	34th Combat Training Squadron
314 AW	314th Airlift Wing
189 AW	189th Airlift Wing
ACC	Air Combat Command
AETC	Air Education and Training Command
AFB	Air Force Base
AFI	Air Force Instruction
AFRC	Air Force Reserve Command
AGL	above ground level
AICUZ	Air Installation Compatible Use Zone
AMC	Air Mobility Command
ANG	Air National Guard
APZ	Accident Potential Zone
ATC	air traffic control
BRAC	Base Realignment and Closure
CZ	Clear Zone
dBA	A-weighted decibel
DNL	Day-Night Average Sound Level
DOD	Department of Defense
DZ	Drop Zone
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulation
FICUN	Federal Interagency Committee on Urban Noise
FY	Fiscal Year
HUD	U.S. Department of Housing and Urban Development
LZ	Landing Zone
MSL	mean sea level
NLR	Noise Level Reduction
NM	nautical mile
SLUCM	Standard Land Use Coding Manual
SUA	Special Use Airspace
UFC	United Facilities Criteria
USAF	U.S. Air Force
USDOT	U.S. Department of Transportation
USEPA	U.S. Environmental Protection Agency

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 19TH AIRLIFT WING (AMC)
LITTLE ROCK AIR FORCE BASE, ARKANSAS

17 JUN 2011

MEMORANDUM FOR AREA GOVERNMENTS

FROM: 19 AW/CC
1250 Thomas Avenue, Suite 106
Little Rock AFB AR 72099-4940

SUBJECT: Air Installation Compatible Use Zone (AICUZ) Study

1. This Air Installation Compatible Use Zone (AICUZ) Study for Little Rock Air Force Base (AFB) is an update of the AICUZ Study from 2003. It is a reevaluation of aircraft noise and accident potential related to U.S. Air Force (USAF) flying operations. This report is designed to aid in the development of local planning mechanisms that will protect public safety and health, and preserve the operational capabilities of Little Rock AFB.

2. This update was initiated because of changes in aircraft operations since the last AICUZ Study, modifications to the software-modeling program made subsequent to the release of the 2003 AICUZ Study, and the implementation of the 2005 Base Realignment and Closure actions. And contains a summary description of the affected areas around the installation. The report outlines the locations of runway Clear Zones, aircraft Accident Potential Zones, and noise zones; and identifies compatible land use for areas in the vicinity of the installation. It is our hope that this information will be incorporated into community plans, zoning ordinances, subdivision regulations, building codes, and other related documents.

3. The basic objective of the AICUZ Program is to achieve compatible uses of public and private lands in the vicinity of military airfields by controlling incompatible development through local actions. This update provides noise contours based upon the Day-Night Average Sound Level (DNL) metric used by the USAF. This report provides the information necessary to maximize beneficial use of the land surrounding Little Rock AFB while minimizing the potential for degradation of the health and safety of the affected public.

4. We greatly value the positive relationship Little Rock AFB has experienced with its neighbors over the years. As a partner in the process, we have attempted to minimize noise disturbances through such actions as avoiding flights over heavily populated areas. We seek your cooperation in implementing the recommendations and guidelines presented in this AICUZ report.

5. Please contact our AICUZ Program Manager, Mr. Andrew Wright, 19 CES/CEAO at 501-987-1086 if you have any questions or concerns about this study.

MICHAEL A. MINIHAN, Colonel, USAF
Commander

Team Little Rock: Home of C-130 Combat Airlift!

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AIR INSTALLATION COMPATIBLE USE ZONE STUDY
FOR
LITTLE ROCK AIR FORCE BASE, ARKANSAS

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1. INTRODUCTION

This study is an update to the Little Rock Air Force Base (AFB) Air Installation Compatible Use Zone (AICUZ) Study completed in 2003. It presents a description of the current noise environment around Little Rock AFB. It reaffirms the U.S. Air Force (USAF) policy of promoting public health, safety, and general welfare in areas surrounding Little Rock AFB. This study identifies changes in flight operations that have occurred since the last study, and provides current noise zones and compatible use guidelines for land areas adjacent to the installation. It is provided as a tool to assist local communities in future planning and zoning activities.

As the host unit at Little Rock AFB, the 19th Airlift Wing's mission is to "Employ the World's Best C-130 Combat Airlifters."

The changes requiring an updated AICUZ Study are attributed to the following:

1. Changes in assigned and transient aircraft operations since the 2003 AICUZ Study
2. The implementation of the 2005 Base Realignment and Closure (BRAC) actions at Little Rock AFB
3. Modifications to the Department of Defense- (DOD) approved NOISEMAP software program (USAF 2009) made subsequent to the release of the 2003 AICUZ Study.

1.1 Purpose of the AICUZ Study

As stated in the 2003 AICUZ Study, the purpose of the AICUZ Program is to promote compatible land development in areas subject to aircraft noise and accident potential. The program was initiated to protect the public's health, safety, and welfare and to protect military airfields from encroachment by incompatible uses and structures. As the cities of Cabot, Jacksonville, and Sherwood, and the counties of Lonoke, Pulaski, and White prepare and modify their land use development plans, recommendations from this updated AICUZ Study should be included in their planning process to prevent incompatibility that could compromise the ability of Little Rock AFB to fulfill its mission requirements. Aircraft noise and accident potential should be major considerations in their planning processes.

AICUZ land use guidelines reflect land use recommendations for Clear Zones (CZs), Accident Potential Zones (APZs) I and II, and four noise zones. These guidelines have been established on the basis of studies prepared and sponsored by several Federal agencies, including the U.S. Department of Housing and Urban Development (HUD), the U.S. Environmental Protection Agency (USEPA), the USAF, and state and local agencies. The guidelines recommend land uses which are compatible with airfield operations, while allowing maximum beneficial use of adjacent properties. The USAF has no desire to recommend land use regulations that render property economically useless. It does, however, have an obligation to the inhabitants of the Little Rock AFB environs and to the citizens of the United States to identify ways to protect the people in adjacent areas, and the public investment in the installation.

The AICUZ Program uses the latest technology to define noise levels in areas near USAF installations. An analysis of Little Rock AFB's flying operations was performed, including types of aircraft; flight patterns used; variations in altitude, power settings, and number of operations; and hours of operations. This information was used to develop the noise contours contained in this study. The DOD NOISEMAP methodology and the Day-Night Average Sound Level (DNL) metric were used to define the noise zones for Little Rock AFB.

1.2 Process and Procedure

Preparation and presentation of this update to Little Rock AFB's AICUZ Study is part of the continuing USAF participation in the local planning process. It is recognized that, as local communities prepare land use plans and zoning ordinances, the USAF has the responsibility of providing inputs on its activities relating to the community. To support that responsibility, a companion document called a Citizen's Brochure was created to support public dissemination of the information presented in this AICUZ Study. The Citizen's Brochure provides a synopsis of this AICUZ Study and offers the local community the opportunity to learn about the AICUZ Program.

This AICUZ Study was prepared using the guidelines established by the USAF and described in Air Force Instruction (AFI) 32-7063, *Air Installation Compatible Use Zone Program*, 13 September 2005 (USAF 2005) and Air Force Handbook 32-7084, *AICUZ Program Manager's Guide*, 1 March 1999 (USAF 1999). The DOD Instruction 4165.57 describes the procedures by which the AICUZ Program can be defined, including the land use compatibility guidelines for the APZs (DODI 1977). AFI 32-7063 implemented the policies set forth in DOD Instruction 4165.57. Land use guidelines set forth in AFI 32-7063 reflect recommended compatible land use classifications or coding for those areas impacted by aircraft noise and potential aircraft safety concerns.

This study updates information on installation flying activities since 2003. Data collection was conducted at Little Rock AFB in November 2009. Aircraft operational and maintenance data were obtained to derive average daily operations by runway and type of aircraft. These data were supplemented by flight track information (where we fly), flight profile information (how we fly), and ground run-up information. After verification for accuracy, data were inputted into the NOISEMAP program to produce DNL contours. Contours were plotted on a map of the airfield vicinity and overlaid with the CZ and APZ areas. **Appendix A** contains detailed information on the development of the AICUZ Program.

2. INSTALLATION DESCRIPTION

2.1 Description and Mission

Little Rock AFB is approximately 15 miles north of Little Rock, Arkansas.

Little Rock AFB consists of 6,217 acres in Pulaski County in central Arkansas (see **Figure 2-1**). The installation is approximately 15 miles north of the twin cities of Little Rock and North Little Rock, Arkansas. As shown in **Figure 2-2**, the airfield at Little Rock AFB includes one runway (Runway 07/25), one assault strip (Runway 069/249), taxiways, multiple aircraft hangars, and an air traffic control (ATC) tower. Little Rock AFB owns the Blackjack Drop Zone (DZ) northeast of the installation in White County, and Little Rock AFB airmen use the All-American Landing Zone (LZ) at Camp Joseph T. Robinson (hereafter referred to as Camp Robinson) to the west, as discussed in **Sections 2.5.4** and **2.5.5**, respectively.

As the home of C-130 Combat Airlift, Little Rock AFB is the only C-130 training base for the DOD, training C-130 pilots, navigators, flight engineers, and loadmasters from all branches of the U.S. military, and 28 allied nations, in tactical airlift and aerial delivery. Little Rock AFB is the headquarters for the 19th Airlift Wing (19 AW). The 19 AW is assigned to the 18th Air Force (18 AF) of Air Mobility Command (AMC), headquartered at Scott AFB, Illinois. AMC's mission is to provide "global air mobility ... right effects, right place, right time" via airlift and aerial refueling for all of America's armed forces. The 18 AF is charged with tasking and executing all air mobility missions. As part of AMC's Global Reach airlift capability, the 19 AW's tasking requirements range from supplying humanitarian airlift relief to victims of disasters to airdropping supplies and troops into the heart of contingency operations in hostile areas.

The 19 AW flies the world's largest fleet of C-130 aircraft and is responsible for providing worldwide deployable C-130 aircraft, aircrews, support personnel, and equipment for AMC and Air Expeditionary Force taskings. The 19 AW is the host unit at Little Rock AFB and has 53 assigned C-130 *Hercules* aircraft, including 28 C-130E, 14 C-130H, and 11 C-130J models. The 19 AW is composed of the 19th Operations Group, 19th Maintenance Group, 19th Mission Support Group, and 19th Medical Group.

Tenant units are also assigned to Little Rock AFB, including the 314th Airlift Wing (314 AW) of Air Education and Training Command (AETC), the 189th Airlift Wing (189 AW) of the Arkansas Air National Guard (ANG), and the 29th Weapons Squadron (29 WS) of Air Combat Command (ACC). The 29 WS is not assigned any aircraft, they use C-130E aircraft from the 314 AW and C-130J aircraft from the 19 AW.

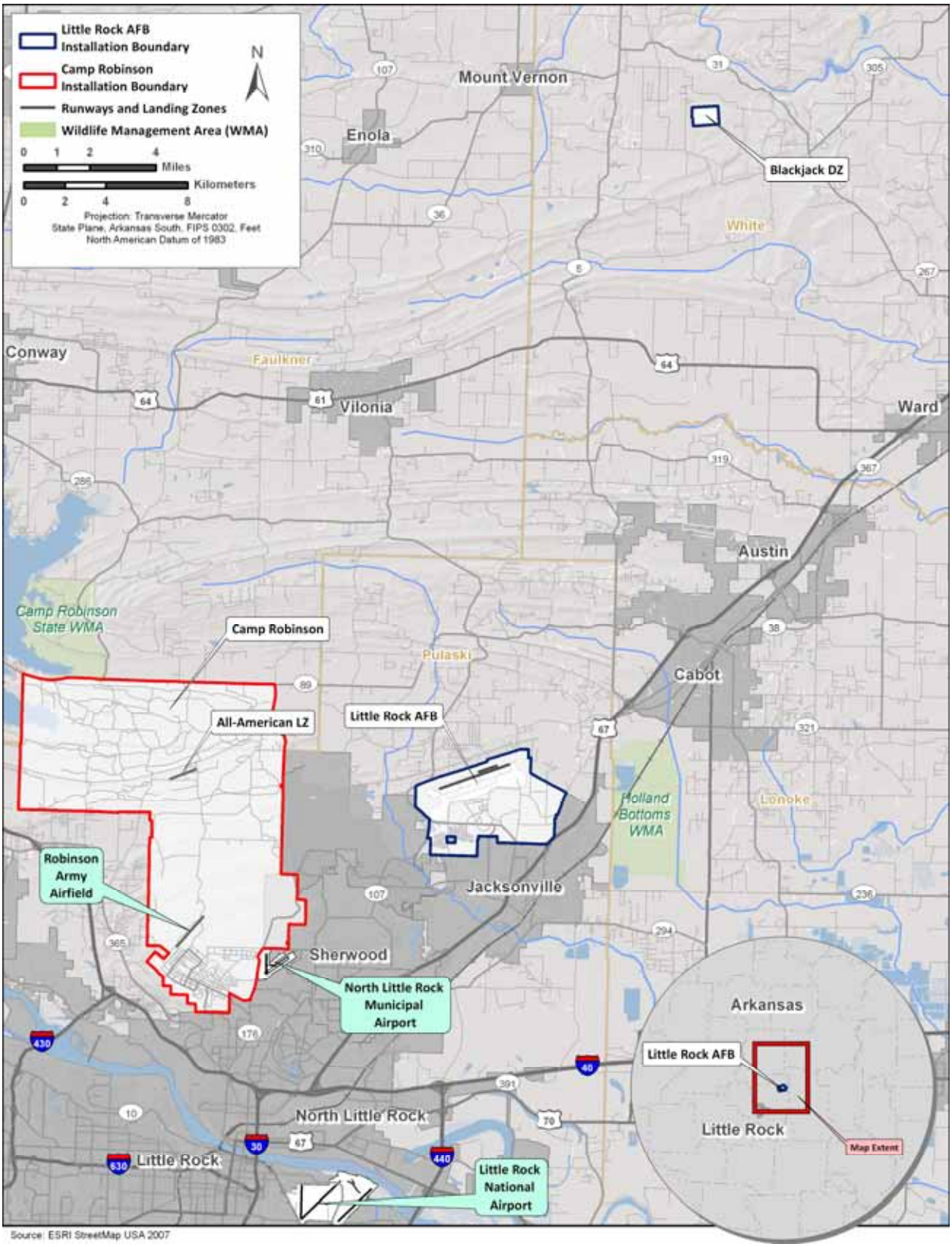

Figure 2-1. Little Rock AFB Vicinity Map

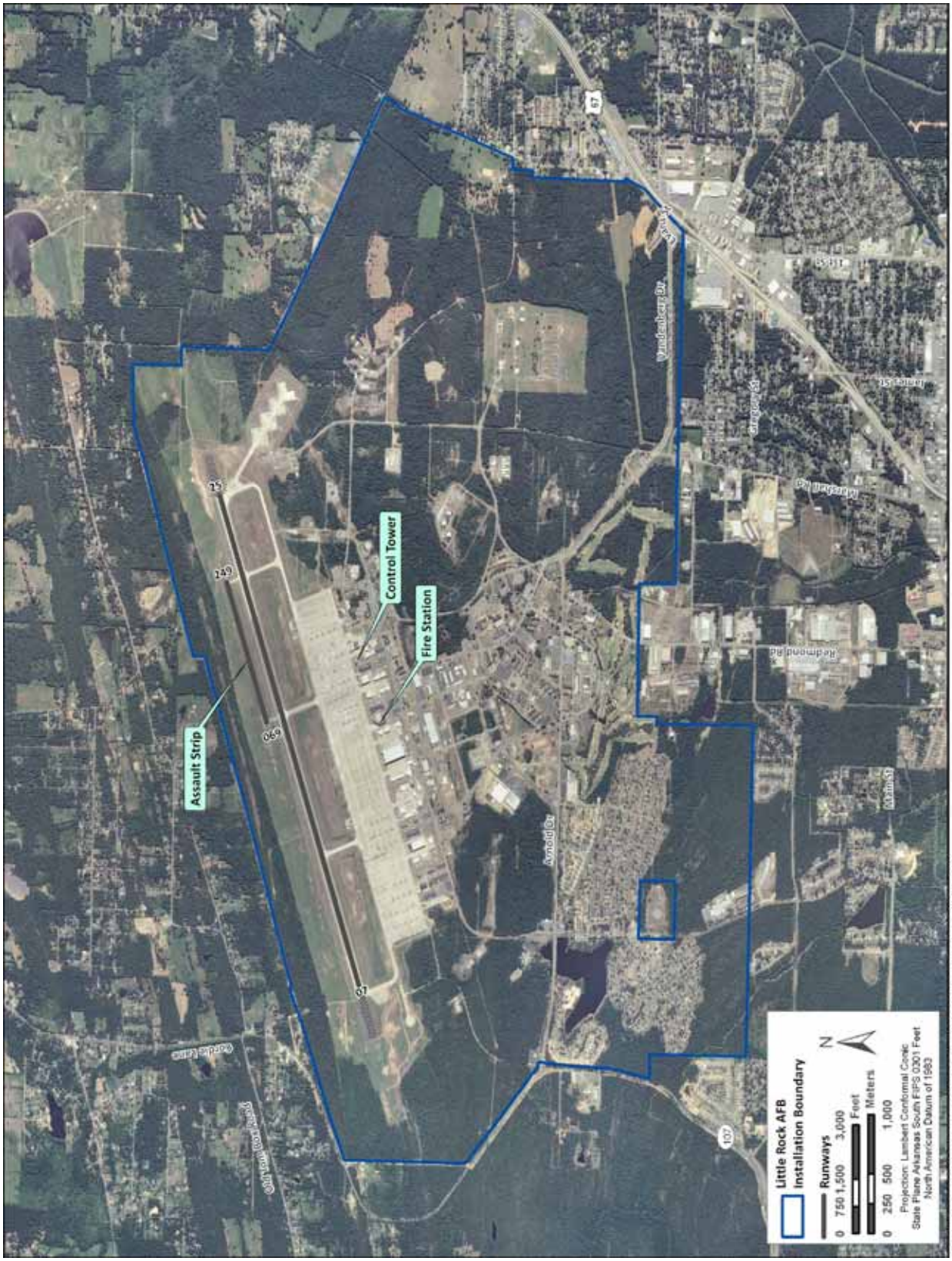

Figure 2-2. Little Rock AFB Installation Map

The 314 AW is aligned under the 19th Air Force of AETC, headquartered at Randolph AFB, Texas. The 314 AW has 37 assigned C-130 aircraft, including 30 C-130E and 7 C-130J models. The 314 AW trains C-130 aircrews for all services in the DOD, the U.S. Coast Guard, and 34 allied nations; and C-21 aircrews through the 45th Airlift Squadron at Keesler AFB, Mississippi. These C-21 aircraft operations are not included in this AICUZ Study because they are not flown out of Little Rock AFB. The 314 AW's mission is "to train the world's best C-130 and C-21 combat airlifters to fly, fight, and win." The 314 AW is composed of wing staff, an operations group, and a maintenance group.

The 189 AW is part of the Arkansas ANG and is composed of the 189 AW headquarters staff, 189th Operations Group, 189th Maintenance Group, 189th Mission Support Group, and the 189th Medical Group. In addition, the wing provides support to four geographically separate units: the Arkansas ANG headquarters; the 123rd Intelligence Squadron and the 154th Weather Flight at Little Rock AFB; and the National Guard Marksmanship Training Center at Camp Robinson in North Little Rock, Arkansas. Only the operations flown by the 189 AW out of Little Rock AFB are included in this AICUZ Study. The 189 AW is assigned 4 C-130E and 6 C-130H aircraft, for a total of 10 C-130 aircraft.

The mission of the 189 AW is to train C-130 aircrew instructor candidates to become instructors in their respective crew positions so that they can return to their units and help keep their unit members combat-ready. In addition, the wing operates the ANG Enlisted Aircrew Academic School, which trains all the USAF's C-130 entry-level loadmasters before they are sent across the installation to the 314 AW for initial and mission qualification training. In times of emergency, as declared by the Governor of Arkansas, the 189 AW performs the state mission as directed by the state adjutant general.

Other tenant units at Little Rock AFB include the 34th Combat Training Squadron (34 CTS); the 96th Aerial Port Squadron of Air Force Reserve Command (AFRC); the 373rd Training Squadron, Detachment 4 of AMC; and the AMC Air Operations Squadron, Detachment 3.

The BRAC process was created by Congress and establishes clear criteria for DOD evaluation of, and recommendations for, the closure of military installations and other actions (such as the movement of aircraft or personnel) to bring the nation's military infrastructure into line with the needs of its armed forces. The 2005 BRAC cycle is the fifth BRAC proposal generated since the process was created in 1988. The 2005 BRAC recommendations for Little Rock AFB included the following:

USAF BRAC recommendations can be viewed at http://www.safie.hq.af.mil/brac/.

1. Consolidate C-130 aircraft at Little Rock AFB to address an imbalance in the active/reserve manning mix for C-130s. This included reducing the number of Little Rock AFB primary C-130E models due to their age, distributing Little Rock AFB C-130J models to other wings of the ANG, transferring C-130J aircraft between wings at Little Rock AFB, and moving 39 C-130 aircraft from several USAF installations to Little Rock AFB. These actions resulted in a Primary Aircraft Authorization of 100 C-130 aircraft at Little Rock AFB in 2009.

2. Establish a Mobility Air Forces Logistics Support Center at Scott AFB, Illinois, by realigning Regional Supply Squadron positions from Hurlburt Field, Florida, and Sembach Air Base, Germany; and Logistics Readiness Squadron positions from Altus AFB, Oklahoma, and Little Rock AFB. The center will provide mobility air forces with one stop for ordering, shipping, and tracking supplies to troops worldwide.

2.2 History

The history of Little Rock AFB is important in understanding the fluctuations in the noise environment in the areas near the installation.

In late 1951, after learning of the USAF's desire for a new installation in the central United States, local leaders sent a letter to the Secretary of the Air Force urging serious consideration of the Little Rock area. At the time Congress was unwilling to allocate funding for the land acquisition; however, in January 1952 the local leaders convinced Pentagon officials that the required land would be acquired by the community and donated to the USAF.

Construction began in December 1953 and command of the new facilities at Little Rock AFB was given to the Strategic Air Command. The first aircraft stationed at the installation included the RB-47 Stratojet aerial reconnaissance aircraft and KC-97 aerial refueling aircraft operated by the 70th Reconnaissance Wing. The 384th Bombardment Wing was also assigned to the installation. Little Rock AFB was officially dedicated on 9 October 1955.

While Little Rock AFB was still home to the two Stratojet wings, the USAF decided to base 18 Titan II Intercontinental Ballistic Missiles in underground silos around the installation. Qualified crews of the 308th Strategic Missile Wing supported the mission uninterrupted, 24 hours a day, for more than 23 years.

In 1962, the Arkansas ANG became a presence at Little Rock AFB. Formerly operating out of Adams Field in Little Rock, the 189th Tactical Reconnaissance Group (the predecessor to the current 189 AW) operated several aircraft before eventually settling on the C-130 in a training role, which they currently share with the 314 AW.

In May 1971, the 314th Tactical Airlift Wing was relocated to Little Rock AFB from Ching Chuan Kang Air Base, Taiwan. The move was in name only; no personnel or equipment were shifted. The intent of the move was to reassign the subordinate units and redesignate the assets at Little Rock AFB to the 314 Tactical Airlift Wing, later renamed the 314 AW. The 308th Strategic Missile Wing was inactivated in August 1987, going quietly into history as the last unit to perform operational duty with Titan II missiles.

Since 1987, the 314 AW has been the only active-duty wing stationed at Little Rock AFB, but there have been numerous changes within the wing and at other levels. The 314th AW transferred from AMC to AETC in 1997 in order to move C-130 aircraft training under AETC while retaining AMC's control over operational aspects of C-130 airlift activities.

The 314 AW remained the installation's host unit until October 2008 when operational control was transferred to the 19 AW. An AMC wing taking command changed the focus of the installation from training to combat. The 19 AW inherited the 314 AW's mission and tradition of excellence including installation operating support responsibilities such as maintenance, medical services, and mission support. The 314 AW became a tenant wing and continues to train C-130 aircrews.

2.3 Economic Impact

2.3.1 Regional Population

Little Rock AFB is approximately 15 miles north of Little Rock, Arkansas.

As shown in **Figure 2-1**, Little Rock AFB is approximately 15 miles north of the twin cities of Little Rock and North Little Rock, Arkansas. The communities adjacent to Little Rock AFB include the City of Cabot to the northeast, the City of Jacksonville to the south and southeast, and the City of Sherwood to the southwest. Consequently, the greatest population density around Little Rock AFB is to the south and southeast in the City of Jacksonville. The Blackjack DZ that is owned by Little Rock AFB is approximately 19 miles northeast of the installation in White County.

During the past several years, most of the populations of the cities and counties adjacent to Little Rock AFB have grown at a faster pace than the State of Arkansas (see **Table 2-1**). From 2000 to 2008, the population of the cities of Jacksonville and Sherwood in Pulaski County grew by more than 1,400 people (a 4.8 percent increase) and 3,000 people (a 14.1 percent increase), respectively. Pulaski County grew by more than 15,000 people (a 4.2 percent increase) in the same timeframe. From 2000 to 2008, the City of Cabot and Lonoke County experienced much larger population increases than the other cities and counties in the Little Rock AFB vicinity. The City of Cabot grew by more than 8,300 people (a 54.7 percent increase) and Lonoke County grew by more than 12,400 people (a 23.5 percent increase). White County, where the Blackjack DZ is located, grew by almost 7,700 people from 2000 to 2008, an 11.4 percent increase. The State of Arkansas grew by almost 182,000 people representing a 6.8 percent increase in the same timeframe.

Table 2-1. U.S. Census Bureau Population Data

	2008 Population	2000 Population	Percent Increase
City of Cabot	23,614	15,261	54.7
City of Jacksonville	31,351	29,916	4.8
City of Sherwood	24,542	21,511	14.1
Lonoke County	65,233	52,828	23.5
Pulaski County	376,797	361,474	4.2
White County	74,845	67,165	11.4
Arkansas	2,855,390	2,673,400	6.8

Source: U.S. Census Bureau 2010

2.3.2 Installation Impact

As shown in **Table 2-2**, there are 5,661 military and 1,601 civilians employed by Little Rock AFB. Of the 5,661 military personnel, active-duty personnel account for 5,381 people, nonextended active-duty Air Force Reserve and ANG account for 125 people, and trainees/cadets account for 155 people. Of the 1,601 civilian personnel, 590 are appropriated fund civilians, 260 are non-appropriated fund civilians, 219 are employed at the Base Exchange, 522 are contract civilians, and 10 are private business employees. In addition to military personnel and civilian workers, the installation supports approximately 33,722 retirees and 5,941 family members (dependents), for a total of 52,866 persons supported by Little Rock AFB. This number is even more significant when compared to the population of the City of Jacksonville, which is 31,351 (see **Table 2-1**).

Little Rock AFB is the largest employer in Jacksonville and is the third-largest employer in Pulaski County.

Table 2-2. Personnel by Classification and Housing Location

Classification	Living On-Installation	Living Off-Installation	Total
Military			
Active Duty	1,011	4,370	5,381
Active/Traditional Reserve	0	125	125
Trainees/Cadets	45	110	155
Subtotal Military Personnel	*1,056*	*4,605*	*5,661*
Civilian			
Appropriated Funds Civilians			590
Non-appropriated Fund Civilians			260
Civilians Employed at Base Exchange			219
Contract Civilians			522
Private On-Installation Business Employees			10
Subtotal Civilian Personnel			*1,601*
Dependents and Retirees			
Active-Duty Dependents			5,941
Retirees			33,722
Subtotal Dependents and Retirees			*39,663*
Total Personnel (Omits Retirees)			**13,203**
Total Persons Supported by Little Rock AFB			**52,866**

Source: Little Rock AFB 2009

Table 2-3 shows the factors that influence Little Rock AFB's total economic impact on the surrounding area for Fiscal Year (FY) 2009. The installation's economic impact includes the total gross payroll for Little Rock AFB personnel, the total actual annual expenditures of the installation, and the estimated annual value of jobs created by Little Rock AFB.

Table 2-3. Annual Economic Impact Estimate

Category	Economic Impact
Annual Payroll	
Annual Military Payroll	$311.3M
Annual Appropriated Fund Civilian Payroll	$29.0M
Annual Non-Appropriated Fund Civilian and Private Business Payroll	$17.5M
Subtotal Annual Payroll (Omits Retirees)	*$357.8M*
Annual Expenditures	
Construction	$29.2M
Services	$21.9M
Materials, Equipment, and Supplies Procurement	$79.7M
Subtotal Annual Expenditures	*$130.8M*
Estimated Number and Dollar Value of Jobs Created	
Estimated Indirect Jobs Created	3,132
Average Annual Pay	$38,470
Estimated Annual Dollar Value of Jobs Created	*$120.5M*
Total Annual Economic Impact	**$609.1M**

Source: Little Rock AFB 2009

Little Rock AFB is the largest employer in Jacksonville (MLRA 2009) and is the third-largest employer in Pulaski County behind the University of Arkansas for Medical Sciences and the Baptist Health healthcare system (AREDC 2007). As shown in **Table 2-3**, in FY 2009 Little Rock AFB generated a $358 million payroll for the local economy. In addition to the payroll, Little Rock AFB construction, services, and commodities contracts totaled almost $131 million.

The estimated dollar value of indirect jobs created by Little Rock AFB's location in central Arkansas is approximately $121 million. This amount, combined with the installation's gross payroll and annual expenditures, brings the total economic impact of Little Rock AFB on the local area to approximately $609 million in FY 2009.

2.4 Flying Activity

2.4.1 Introduction

To describe the relationship between aircraft operations and land use, it is necessary to fully understand the exact nature of flying activities. An inventory has been made of such information for the aircraft based at Little Rock AFB: where those aircraft fly, how high they fly, how many times they fly over a given area, and at what time of day they operate. An aircraft operation is defined as a single aircraft movement, such as an arrival or a departure. A closed pattern accounts for two operations, an arrival and a departure. Pilots commonly use closed patterns to practice takeoffs and landings, and closed patterns usually remain close to the airfield.

Airfield environs planning is concerned with three primary aircraft operational/land use determinants: (1) hazards to operations from land uses (e.g., height obstructions), (2) aircraft noise, and (3) accident potential to land users. Each of these concerns is addressed in conjunction with mission requirements and safe aircraft operation to determine the optimum flight track for each aircraft type. Data for this AICUZ Study were provided according to flight track (i.e., where they fly), flight profile (i.e., how they fly), flight occurrence (i.e., how often they fly), and ground run-up (i.e., engine maintenance activities).

Section 3 presents a detailed description of the current noise zones and APZs.

2.4.2 Regional Airspace

As shown in **Figure 2-3**, controlled airspace has been established in the Little Rock AFB region to manage air traffic. Class D airspace extends in a 5.6-nautical mile (NM) radius circle around Little Rock AFB, and Class C airspace extends in a 10-NM radius circle around Little Rock National Airport, approximately 13 miles southwest of Little Rock AFB. Little Rock National Airport's Class C and Little Rock AFB's Class D airspace overlap in the southeast through southwest quadrants.

Class D airspace can generally be described as a controlled airspace that extends from the surface or a given altitude to a specified higher altitude. At Little Rock AFB, Class D airspace exists from the surface up to and including 2,800 feet above mean sea level (MSL) within a 5-NM radius around Little Rock AFB. Class D airspace is designed to provide control into and out of primary airports that have an operational control tower and radar approach capabilities, and where aircraft operations are periodically at high-density levels. All aircraft operating within Class D airspace are required to maintain two-way radio communication with the ATC facilities.

Also overlying Little Rock AFB is Class E airspace designated as an extension to the Class D airspace area described. Class E airspace is described as generally controlled airspace. The Little Rock AFB ATC tower provides assistance to aircraft within the Little Rock AFB Class D airspace. Little Rock Approach Control (located at Little Rock National Airport) has authority at altitudes up to and including 15,000 feet above MSL within approximately 30 NM of the airport. Aircraft flying at altitudes greater than 15,000 feet above MSL are controlled by the Memphis Air Route Traffic Control Center at Memphis International Airport, Tennessee.

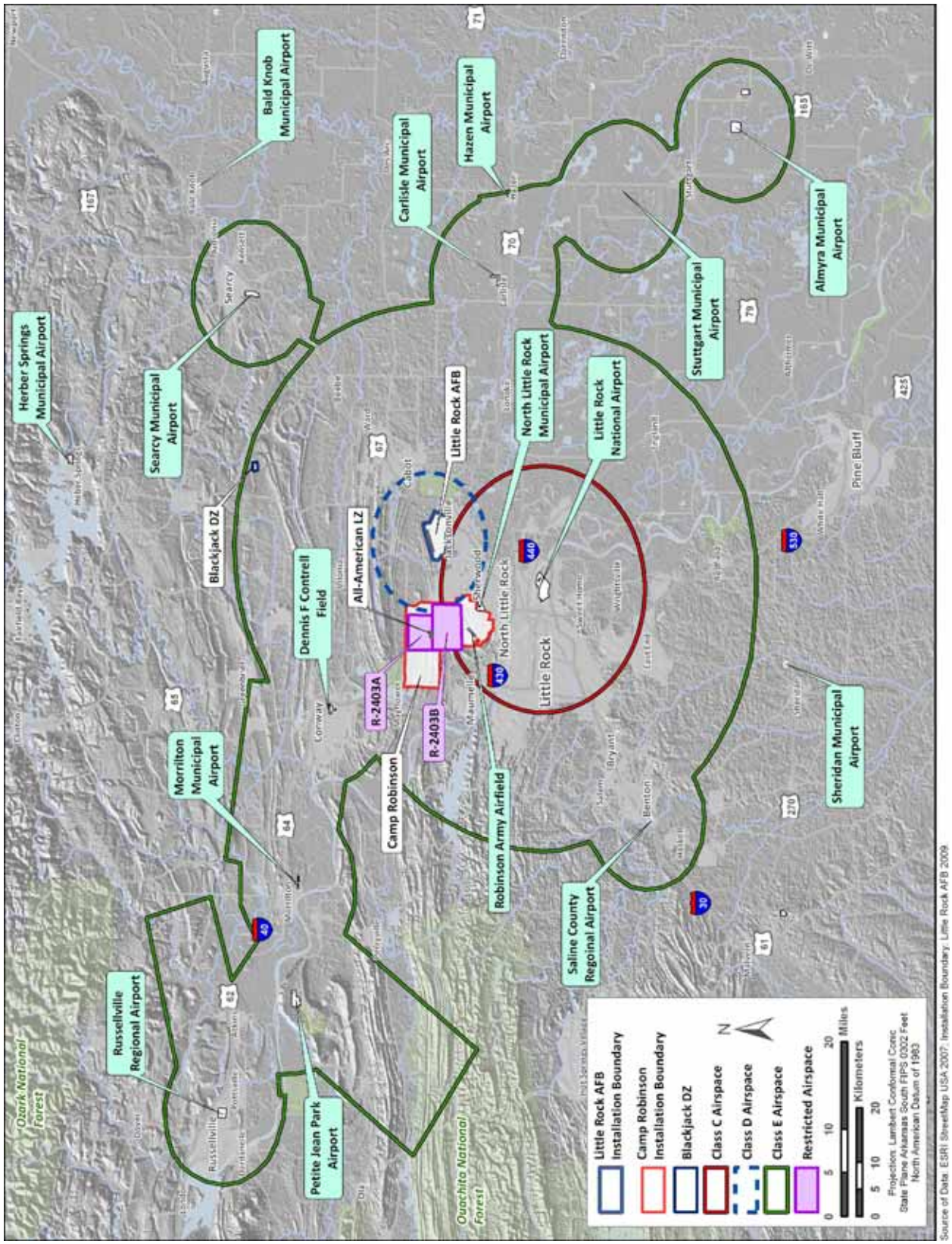

Figure 2-3. Controlled Airspace in the Vicinity of Little Rock AFB

The airspace within a 20-NM semi-circle north of Little Rock AFB from 500 feet above ground level (AGL) to 3,000 feet above MSL is used extensively and normally has high concentrations of aircraft. Airfields in close proximity to Little Rock AFB include Conway Municipal Airport to the northwest, Searcy Municipal Airport to the northeast, North Little Rock Municipal Airport to the southwest, and various private fields. Pilots flying in the vicinity of these airports exercise caution as single C-130 aircraft or formations of up to six aircraft transit this airspace regularly.

A normal flight at Little Rock AFB consists of two or four C-130 aircraft flying in formation. Flights have also been increased to formations of six aircraft to increase aircrew training availability.

A Special Use Airspace (SUA), Restricted Area R-2403A/B, is present in the flying area around Camp Robinson. R-2403 A/B is located 5 to 9 miles west of Little Rock AFB, as shown in **Figure 2-3**, and can be active up to 16,000 feet above MSL. An SUA consists of airspace within which specific activities must be confined or wherein limitations are imposed on aircraft not participating in those activities. SUA descriptions are contained in Federal Aviation Administration (FAA) Order 7400.8, *Special Use Airspace* (USDOT 2007). Restricted areas contain airspace within which flight of aircraft, while not wholly prohibited, is subject to restrictions. Restricted airspace can contain hazardous military activities including live firing of weapons, ordnance delivery, or aircraft testing.

2.4.3 Little Rock AFB Airfield

2.4.3.1 Airfield Description

Runway Use. The airfield at Little Rock AFB includes one runway (Runway 07/25) and one assault strip (Runway 069/249). Both runways are oriented in a northeast/southwest direction. Runway 07/25 is 12,000 feet long by 200 feet wide with a 1,000-foot overrun on each end, and Runway 069/249 is 3,500 feet long by 60 feet wide. Since the flight pattern to the assault strip is the same as the pattern to the main runway, the flight tracks were not separated in this AICUZ Study. Aircraft operating at Little Rock AFB use Runway 25 approximately 98 percent of the time (i.e., they depart to the southwest and arrive from the northeast) and Runway 07 approximately 2 percent of the time (i.e., they depart to the northeast and arrive from the southwest). The runway and assault strip at Little Rock AFB are shown in **Figure 2-2**.

Flight Patterns. The flight patterns in **Figures 2-4, 2-5,** and **2-6** represent the way aircraft arrive, depart, and perform closed-pattern operations at the Little Rock AFB airfield. As shown in **Figures 2-4** and **2-5**, most of the aircraft generally depart and arrive north of Little Rock AFB. Some of the arrival flight tracks in **Figure 2-4** start from an area that is only about 5 NM north of the airfield. Aircraft that complete these arrivals do so in conjunction with other operations, such as closed patterns; therefore, they are closer to the airfield when they begin these operations than aircraft that arrive from an off-installation mission. As shown in **Figure 2-6**, closed-pattern flight tracks on Runway 07/25 are flown to the north and south of the airfield; however, most of these operations are completed north of the airfield. Flight tracks have been modified to minimize noise exposure to the cities of Jacksonville and Sherwood and to minimize conflict with civilian aircraft operations to the greatest extent possible.

The vast majority of flights from Little Rock AFB depart to the southwest and arrive from the northeast.

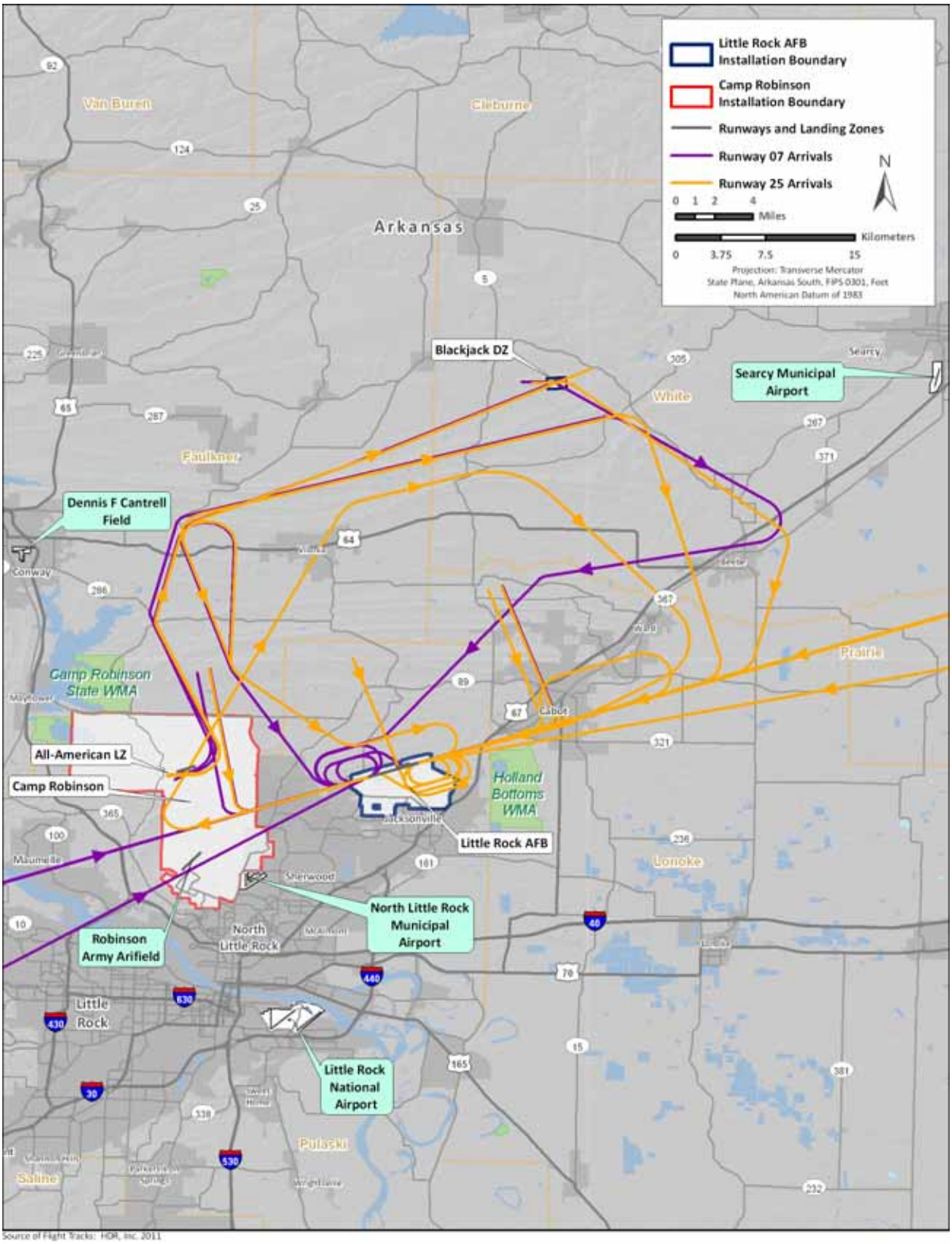

Figure 2-4. Arrival Flight Tracks at Little Rock AFB

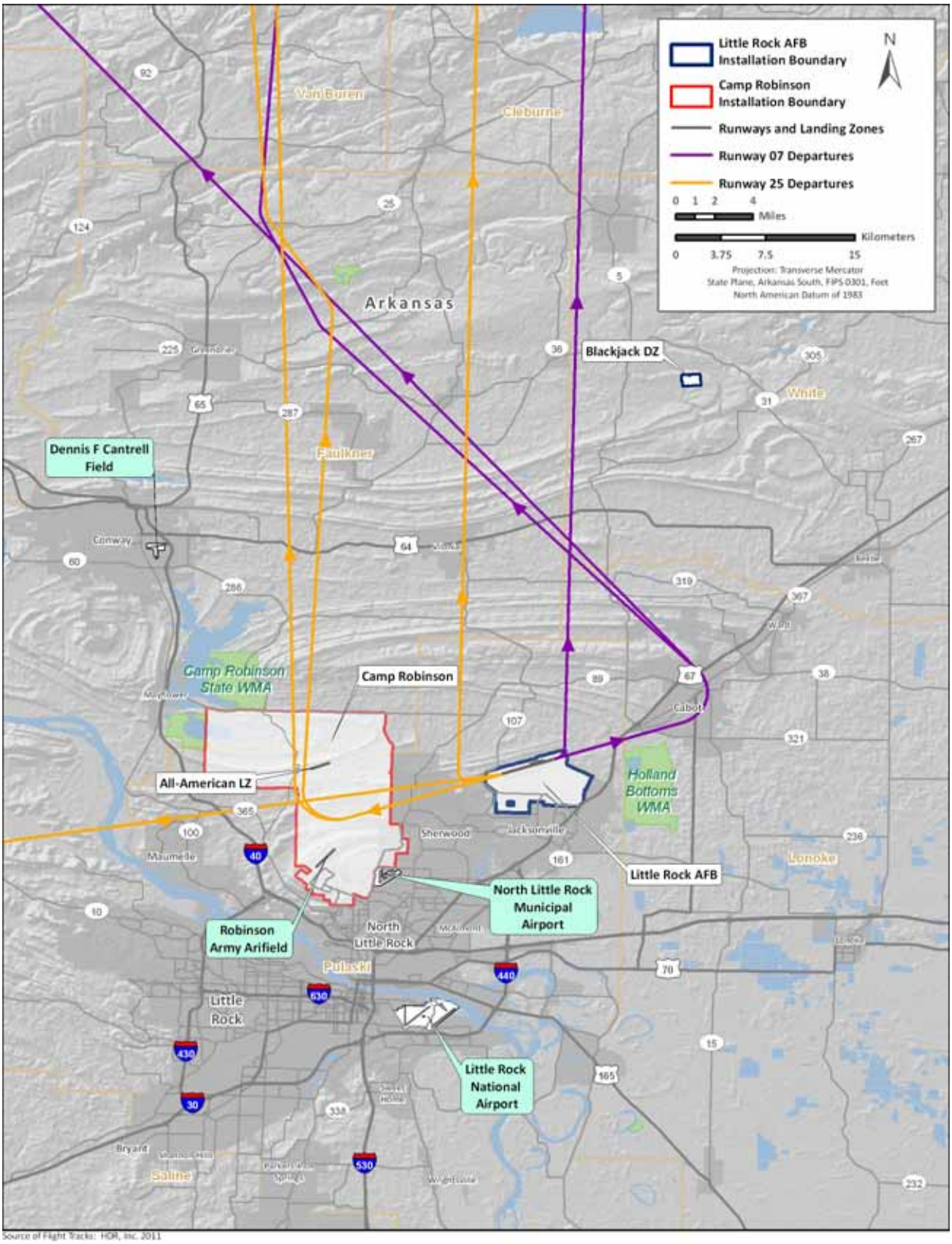

Figure 2-5. Departure Flight Tracks at Little Rock AFB

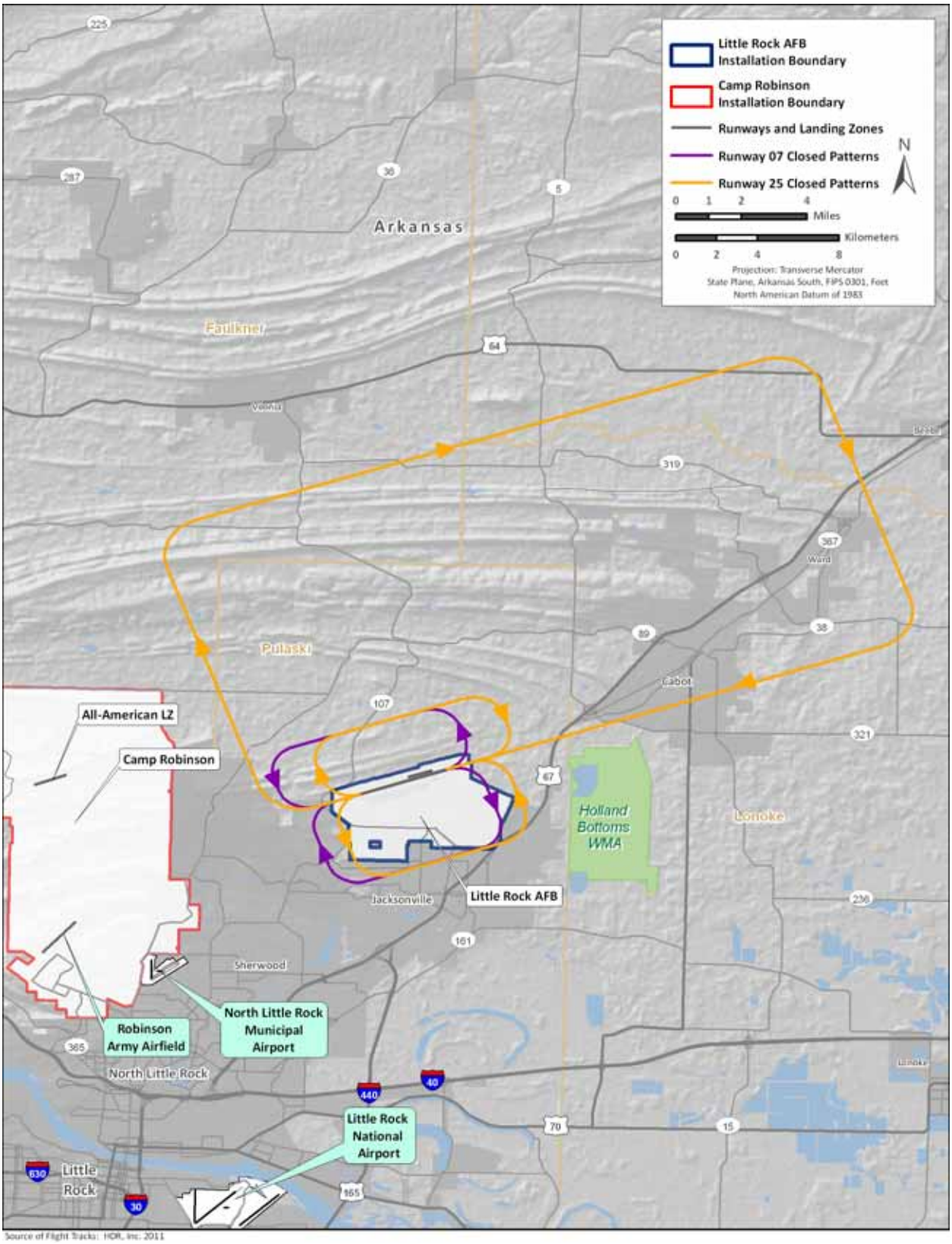

Figure 2-6. Closed-Pattern Flight Tracks at Little Rock AFB

Maintenance Engine Run-ups. Maintenance engine run-ups are performed with the C-130E, H, and J aircraft at Little Rock AFB. The engine run-ups are normally performed on the parking apron south of the runway. On average, approximately 69 percent of maintenance runs are conducted during the day (between 7 a.m. and 10 p.m.) and 31 percent are conducted at night (between 10 p.m. and 7 a.m.). Various types of engine run-ups are performed on the based aircraft.

2.4.3.2 Aircraft Operations at Little Rock AFB Airfield

Table 2-4 summarizes the average busy-day flight operations at the Little Rock AFB airfield. The operations data were derived from information provided by Little Rock AFB staff including flying organization personnel and ATC tower personnel. Various types of transient military aircraft conduct operations at Little Rock AFB. There were 515.38 average busy-day operations at the Little Rock AFB airfield. About 24 percent of the total daily operations occur during nighttime (10:00 p.m. to 7:00 a.m.).

The C-130 Hercules primarily performs the tactical portion of the USAF's airlift mission. The aircraft is capable of operating from rough, dirt strips and is the prime transport for air dropping troops and equipment into hostile areas.

Table 2-4. Average Busy Day Aircraft Operations at Little Rock AFB Airfield

Aircraft Type	Arrivals	Departures	Closed Patterns	Total
Based Aircraft				
19 AW				
C-130E	19.10	19.10	2.36	42.92
C-130H	12.74	12.74	1.58	28.64
C-130J	19.10	19.10	2.36	42.92
Subtotal	*50.94*	*50.94*	*6.30*	*114.48*
314 AW				
C-130E	19.65	19.65	6.84	52.98
C-130J	51.01	51.01	42.39	186.80
Subtotal	*70.66*	*70.66*	*49.23*	*239.78*
189 AW				
C-130E	13.32	13.32	5.85	38.34
C-130H	39.96	39.96	17.55	115.02
Subtotal	*53.28*	*53.28*	*23.40*	*153.36*
29 WS				
C-130E	0.33	0.33	0	0.66
C-130J	0.67	0.67	0	1.34
Subtotal	*1.00*	*1.00*	*0*	*2.00*
Subtotal	***175.88***	***175.88***	***78.93***	***509.62***
Transient Aircraft				
C-130	1.31	1.31	0	2.62
F-18	0.35	0.35	0	0.70
C-21	0.15	0.15	0	0.30
T-38	0.15	0.15	0	0.30
Other	0.92	0.92	0	1.84
Subtotal	***2.88***	***2.88***	***0***	***5.76***
Airfield Total	**178.76**	**178.76**	**78.93**	**515.38**

Note: Total daily operations = arrivals + departures + (2 x closed patterns).

F-18 aircraft was one of the military transient aircraft that operated out of Little Rock AFB in 2009. The F-18 is a supersonic, all-weather carrier-capable multirole fighter jet, designed to attack both ground and aerial targets.

The number of daily aircraft operations has changed since the last AICUZ Study was conducted in 2003. As shown in **Table 2-5**, Little Rock AFB airmen conducted approximately 43 more aircraft operations per day in 2003 as compared to 2011. As shown, the number of closed-pattern operations decreased by more than 60 percent from 2003 to 2011. However, the number of arrivals and departures more than doubled from 2003 to 2011. These changes in the number of operations as well as changes in other operational conditions (flight tracks, flight profiles, and ground run-ups) resulted in differences in the areas of noise exposure, as discussed in **Section 3.3.2**.

Table 2-5. 2003 and 2011 Average Busy Day Aircraft Operations at Little Rock AFB Airfield

Flight Type	Average Busy Day Aircraft Operations	
	2003 AICUZ Study	*2011 AICUZ Study*
Arrivals	80.55	178.76
Departures	80.55	178.76
Closed Patterns	198.60	78.93
Total	**558.30**	**515.38**

Source for 2003 data: Little Rock AFB 2003
Note: Total daily operations = arrivals + departures + (2 x closed patterns).

2.4.4 Blackjack Drop Zone

2.4.4.1 Blackjack Drop Zone Description

The mission of the 19 AW, 314 AW, and 189 AW is to provide air transportation for airborne forces, their equipment, and supplies with delivery by airdrop, airland, or extraction. In order to perform this mission, Little Rock AFB pilots conduct airdrop training at the Blackjack DZ. As shown on **Figure 2-7**, the DZ is approximately 19 miles northeast of the installation in White County, approximately 2.3 miles southeast of Romance, Arkansas.

Only airdrops are conducted at the Blackjack DZ. The most common airdropped items are 15-pound sandbags, 1,000-pound boxes, and 3,000-pound simulated heavy equipment pallets. However, actual personnel and equipment are also dropped with parachutes.

The DZ was established in the early 1990s and is approximately 4,290 feet long and 3,000 feet wide. The run-in headings to the DZ are 087 and 230. The impact area within the DZ is cleared of trees and shrubs and narrow gravel roads are maintained for the full length of the impact area to permit the removal of dropped equipment by truck. Additional land was acquired in 1996 to provide a buffer zone around the existing DZ.

Most airdrops occur at 600 to 1,200 feet AGL, although some are conducted as low as 500 feet AGL or as high as 7,000 feet above MSL. The most common airdropped items used in training exercises are 15-pound sandbags, 1,000-pound boxes, and 3,000-pound simulated heavy equipment pallets. However, actual personnel and equipment are also dropped with parachutes.

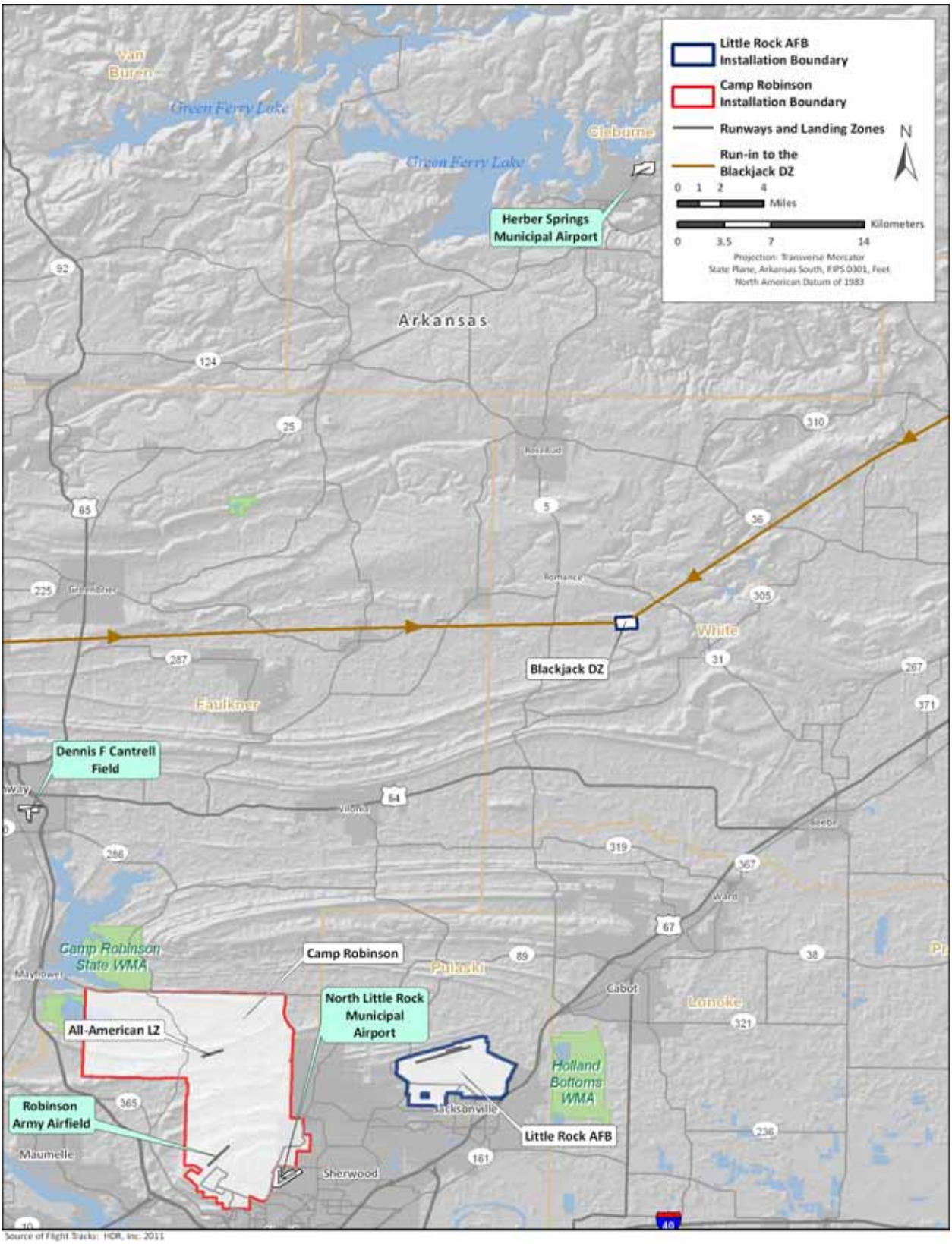

Figure 2-7. Run-Ins to the Blackjack DZ

2.4.4.2 Aircraft Operations at Blackjack Drop Zone

Aircraft from Little Rock AFB practice airdrops at Blackjack DZ; aircraft do not land there. **Table 2-6** reflects 88.52 average busy-day operations at the Blackjack DZ. No closed patterns are conducted. About 42 percent of the total daily operations occur during nighttime (10:00 p.m. to 7:00 a.m.).

Table 2-6. Average Busy Day Little Rock AFB Aircraft Operations at Blackjack Drop Zone

Aircraft Type	Ingress	Egress	Total
19 AW			
C-130E	7.68	7.68	15.36
C-130H	5.12	5.12	10.24
C-130J	7.68	7.68	15.36
Subtotal	*20.48*	*20.48*	*40.96*
314 AW			
C-130E	11.14	11.14	22.28
C-130J	8.16	8.16	16.32
Subtotal	*19.30*	*19.30*	*38.60*
189 AW			
C-130E	1.12	1.12	2.24
C-130H	3.36	3.36	6.72
Subtotal	*4.48*	*4.48*	*8.96*
Blackjack DZ Total	**44.26**	**44.26**	**88.52**

2.4.5 All-American Landing Zone

2.4.5.1 All-American Landing Zone Description

In addition to the Blackjack DZ, Little Rock AFB pilots also use the All-American LZ approximately 7 miles west of the installation within the north-central portion of Camp Robinson as shown in **Figure 2-1**. Camp Robinson is a 33,000-acre Army National Guard training facility; it is also the headquarters of the Arkansas National Guard. It is one of the largest state-operated training sites in the United States and is open year round for training. Both airdrops and air landings are conducted at the All-American LZ by Little Rock AFB airmen. The LZ is 4,650 feet long and 90 feet wide. The run-in headings when completing air landings are 070 and 250 and the headings when completing air drops are 080 and 260, as shown on **Figure 2-8**. Closed patterns are flown at All-American LZ; the majority of these patterns are flown to the north. Airdrop altitudes and equipment are similar to those used at Blackjack DZ.

Both airdrops and air landings are conducted at the All-American LZ. The All-American LZ is approximately 7 miles west of Little Rock AFB within the north-central portion of Camp Robinson, an Army National Guard training facility.

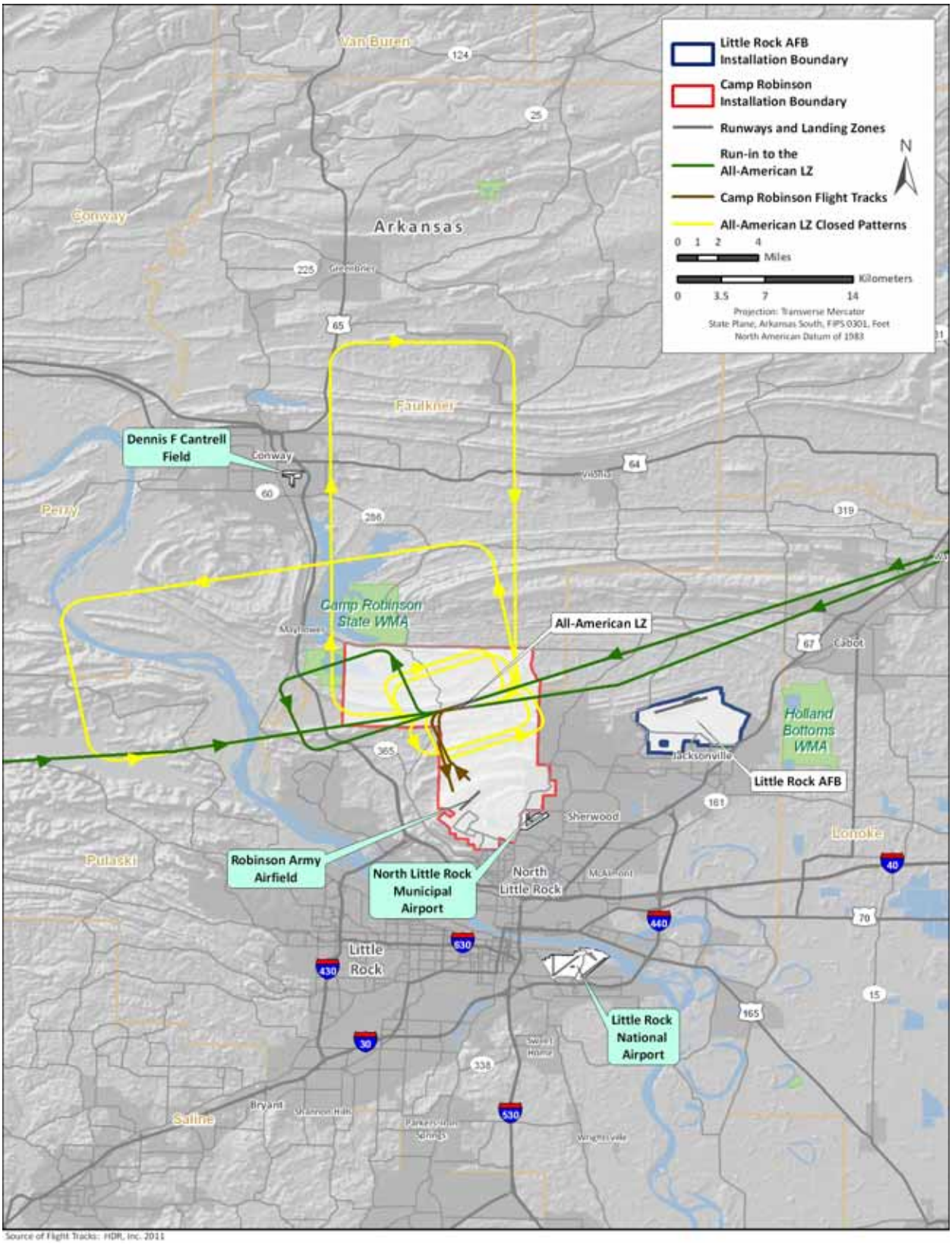

Figure 2-8. Flight Tracks Associated with the All-American LZ

2.4.5.2 Aircraft Operations at All-American Landing Zone

Little Rock AFB airmen did not conduct aircraft operations at the All-American LZ in 2011 since the LZ was under construction. The aircraft operations presented in **Table 2-7** are based on projections that will occur at the LZ once construction is completed; these estimates are intended to provide the level of future use of the All-American LZ by Little Rock AFB airmen.

Table 2-7 shows 104.82 average busy-day operations at the All-American LZ. About 42 percent of the total daily operations occur during nighttime (10:00 p.m. to 7:00 a.m.).

Table 2-7. Average Busy Day Little Rock AFB Aircraft Operations at All-American Landing Zone

Aircraft Type	Arrivals	Departures	Closed Patterns	Total
19 AW				
C-130E	1.92	1.92	7.20	18.24
C-130H	1.28	1.28	4.80	12.16
C-130J	1.92	1.92	7.20	18.24
Subtotal	*5.12*	*5.12*	*19.20*	*48.64*
314 AW				
C-130E	2.78	2.78	10.44	26.44
C-130J	2.04	2.04	7.65	19.38
Subtotal	*4.82*	*4.82*	*18.09*	*45.82*
189 AW				
C-130E	0.14	0.14	1.05	2.38
C-130H	0.84	0.84	3.15	7.98
Subtotal	*0.98*	*0.98*	*4.20*	*10.36*
Total	**10.92**	**10.92**	**41.49**	**104.82**

3. LAND USE COMPATIBILITY GUIDELINES

3.1 Introduction

The DOD developed the AICUZ Program for military airfields. Using this program, DOD works to protect aircraft operational capabilities at its installations and to assist local government officials in protecting and promoting the public health, safety, and quality of life. The goal is to promote compatible land use development around military airfields by providing information on aircraft noise exposure and accident potential.

Airfield planning is concerned with three primary constraints:
1. *Height obstructions*
2. *Aircraft noise*
3. *Accident potential.*

An AICUZ Study describes three basic types of constraints that affect, or result from, flight operations. As discussed in **Section 3.1**, the first constraint involves areas that the FAA and DOD have identified for height limitations (see Height and Obstruction Criteria in **Appendix D**). USAF obstruction criteria are based upon those contained in Federal Aviation Regulation (FAR) Part 77, Subpart C, *Objects Affecting Navigable Airspace* (14 Code of Federal Regulations Part 77). These obstruction criteria are defined for all military airfields regardless of the current flying mission. The height restrictions are to prevent man-made structures from creating an obstruction that could prevent aircraft from accessing airports or pose an accident hazard. Aircraft approach and depart from airports on a diagonal line that gets farther from the ground as distance from the airport increases. The height obstruction criteria reflect this principle, and permit the placement of taller structures as distance from the airport increases.

The second constraint involves noise zones associated with aircraft operations. As discussed in **Section 3.2**, using the NOISEMAP program, DOD produces noise contours showing the noise exposure levels generated by Little Rock AFB aircraft operations. The area encompassed by two noise contours is known as a noise zone. This makes noise zones uniquely suited for making important zoning and land use decisions based on noise exposure. Additional information on noise methodology is contained in **Appendix C** of this report.

The third constraint involves military APZs based on statistical analysis of past DOD aircraft accidents. As discussed in **Section 3.3**, DOD analysis has determined that the areas immediately beyond the ends of runways and along the approach and departure flight paths have significant potential for aircraft accidents. Based on this analysis, DOD developed three zones that have high relative potential for accidents: CZs and APZs I and II.

3.2 Areas Identified for Height Restrictions

Areas identified for height restrictions result from the application of criteria for height and obstruction clearance given in FAR Part 77 and in USAF design standards. FAR Part 77 applies to all DOD military facilities in the United States. This regulation stipulates that modifications to existing facilities and construction of new facilities must consider navigable airspace, and could require that a Notice of Proposed Construction or Alteration be filed with the FAA (DOD 2008). Such a filing is required for any structure that extends 200 feet above the surface of the ground and is within 10 NM of an airfield. The FAA's height obstruction criteria are outlined in the FAA Advisory Circular 150/5300-13, which classifies an obstruction to air navigation as an object of greater height than any of the heights or surfaces presented in FAR Part 77.

The standards in FAR Part 77.28, which is specifically for military airfields, states that the area around a runway must be kept clear of objects that might damage an aircraft and therefore the area is bounded by imaginary airspace control surfaces that are defined in detail in **Appendix D**. Imaginary airspace control surfaces for military airfields such as Little Rock AFB are shown in **Figure D-1**. The purpose of these imaginary airspace control surfaces is to provide a planning tool to graphically depict airspace management concepts in a way that can enhance the safety and efficiency of aircraft operations. These regulations can prevent the construction of structures whose height could compromise the ability of aircraft to land safely, particularly in adverse weather conditions or during military training operations.

Although the FAA sets airspace heights, the FAA does not have the authority to control the height of structures under the imaginary airspace control surfaces. Therefore, in order to protect the health, safety, and welfare of populations around military airfields, the local communities must enforce the obstruction height restriction guidelines established by the FAA. The local communities around DOD airfields should regulate the land areas outlined by these criteria to prevent uses that might otherwise be hazardous to aircraft operations.

3.3 Noise Zones

3.3.1 Introduction

Cumulative noise levels, resulting from multiple single events, are used to characterize effects from aircraft operations. The cumulative DNL is expressed in A-weighted decibels (dBA) and presented in the form of noise contours. The DNL metric is calculated using the computerized noise model, NOISEMAP. This noise metric incorporates a "penalty" for nighttime noise events to account for increased annoyance. DNL is the energy-averaged sound level measured over a 24-hour period, with a 10-dBA penalty assigned to noise events occurring between 10:00 p.m. and 7:00 a.m. DNL values are obtained by averaging sound exposure level values over a given 24-hour period.

The DNL noise metric incorporates a penalty for late night (10 p.m. to 7 a.m.) noise events to account for increased annoyance.

DNL is a time-averaged noise metric, which takes into account both the noise levels of individual events that occur during a 24-hour period and the number of times those events occur. The logarithmic nature of the decibel unit causes the noise levels of the loudest events to control the 24-hour average. For an example of this characteristic using an aircraft flyover, consider a case in which 1 flyover occurs during daytime hours creating a sound level of 100 dBA for one second. The DNL for this 24-hour period would be 50.6 dBA. If there were 30 flyovers at 100 dBA for 1 second each, the DNL for this 24-hour period would be 65.5 dBA. The averaging of noise over a 24-hour period does not ignore the louder single events. This is the basic concept of a time-averaged sound metric, and specifically the DNL. The actual sound levels that a person hears fluctuate throughout the 24-hour period. DNL is the designated noise metric of the FAA, HUD, USEPA, U.S. Department of Transportation (USDOT), and the DOD for determining land use compatibility in the airport environment.

The USAF has adopted the DOD-approved NOISEMAP software program, and uses it in predicting noise exposure that would result from aircraft operations in the vicinity of an airfield (USAF 2009). Using the NOISEMAP program (Version 7.353), the DOD produced noise contours showing the noise exposure levels generated by 2011 Little Rock AFB aircraft operations. NOISEMAP visually creates continuous contours that connect all points of the same noise exposure level, in much the same way as ground contours on a topographic map visually represent lines of equal elevation. These noise contours are drawn in 5 dBA DNL increments from the airfield, ranging from 65 dBA DNL up to 80 dBA DNL, and are overlaid on a map of the airport vicinity. The area encompassed by two noise contours is known as a noise exposure zone (also referred to as a "noise zone"). This updated AICUZ Study contains guidelines for compatible land uses in relation to four DNL noise zones, as listed as follows:

DNL noise levels are depicted visually as noise contours that connect points of equal value. The area encompassed by two noise contours is known as a noise zone.

- 65–69 dBA DNL
- 70–74 dBA DNL
- 75–79 dBA DNL
- 80+ dBA DNL.

3.3.2 Understanding the Historical Noise Environment

The 2003 AICUZ noise zones associated with Little Rock AFB are presented along with the current 2011 AICUZ noise zones to show how noise exposure levels have fluctuated over time from varying aircraft-related factors (e.g., aircraft type, number of operations, flight track). Noise zones were developed for the 2003 AICUZ Study to reflect the changes in flight operations and assigned aircraft types since the previous AICUZ Study, which was completed in 1992 (Little Rock AFB 2003).

The 2003 and 2011 65 dBA DNL noise zones were plotted on an aerial map and are shown in **Figure 3-1**. 65 dBA DNL is considered the level where land use planning recommendations begin. AICUZ noise zones describe the noise characteristics of a specific operational environment and, as such, change when operational modifications are made. Overall, as shown in **Table 3-1**, there are an additional 363 acres in the 2003 noise zones as compared to the 2011 noise zones. This is primarily because more operations were conducted in 2003 as compared to 2011 (see **Section 2.4.3.2**). In addition, modifications to the NOISEMAP software program made subsequent to the release of the 2003 AICUZ Study play a role in the changes in noise exposure.

The 2003 and 2011 noise zones are shown to demonstrate that noise zones are not static, but are dependent on aircraft type, number, performance, and flight path.

Table 3-1. On- and Off-Installation Acreage within the 2003 and 2011 DNL Noise Zones

DNL Noise Zones	Acres	
	2003 AICUZ Study	*2011 AICUZ Study*
65–69 dBA	2,908	2,640
70–74 dBA	797	734
75–79 dBA	415	349
80+ dBA	177	211
Total	**4,297**	**3,934**

Source for 2003 data: Little Rock AFB 2003

The 2003 and 2011 DNL noise zones at Little Rock AFB extend outside the installation boundary to the east, west, and north, but the noise zones differ in several areas. In particular, as depicted on **Figure 3-1**, the 2011 noise zones extend northeast of the installation. This is primarily due to the increased use of tactical training arrivals in 2011 as compared to 2003. The 2003 and 2011 DNL noise zones encompass land to the north in Pulaski County; this oval shape is the result of the closed-pattern flights flown north of the airfield. However, the 2003 DNL noise zones encompassed more land in this area since more closed patterns were flown in 2003 as compared to 2011. While these two areas represent the most noticeable changes in noise exposure between the two AICUZ Studies, it should be noted that other factors, including changes in flight profiles, flight occurrence, and ground run-ups also contributed to the changes in the noise zones.

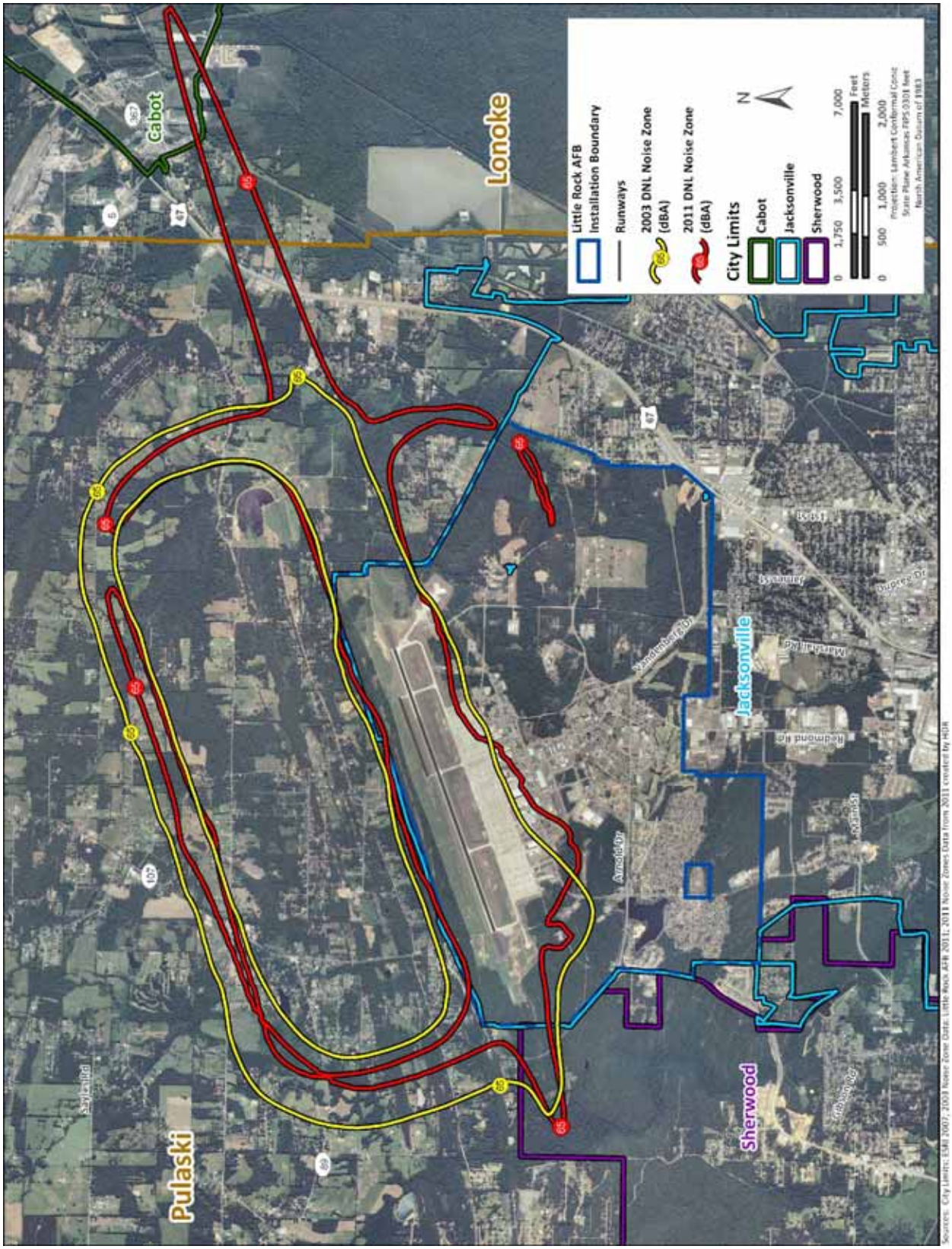

Figure 3-1. 2003 and 2011 DNL Noise Zones at Little Rock AFB

3.3.3 2011 Noise Zones

3.3.3.1 Little Rock AFB Airfield

Current noise zones, based on data collected in November 2009, extend mainly to the north and northeast from the runway, as shown on **Figure 3-2**, and extend outside the installation boundary in these directions. As expected, the noise zones follow the same general path as the flight tracks as shown in **Figures 2-4** through **2-6**. As discussed previously, the majority of the operations at Little Rock AFB are flown to the north; consequently, the noise zones are present primarily to the north of the installation. The oval shape to the north of the runway is a result of the closed-pattern flights flown north of the airfield as shown on **Figure 2-6**. The 2011 DNL noise zones encompass land outside of the installation boundary primarily in Pulaski County; however, they also encompass approximately 269 acres of land in Lonoke County and approximately 76 acres in the City of Cabot.

3.3.3.2 Blackjack Drop Zone

Aircraft operations at the Blackjack DZ do not generate noise levels that are 65 dBA DNL or greater. Noise levels of less than 65 dBA DNL do not meet the threshold for which the USAF and DOD feel land use controls are necessary. Therefore, noise at Blackjack DZ is not shown on a figure. However, noise levels of less than 65 dBA DNL do not mean that persons in the area would not hear aircraft.

3.3.3.3 All-American LZ

As shown in **Figure 3-3**, the 2011 DNL noise zones at the All-American LZ extend mainly to the southwest of the LZ; they do not extend outside the Camp Robinson installation boundary. The 65–69 dBA DNL noise zone encompasses approximately 951 acres of Camp Robinson property and the 70–74 dBA DNL noise zone encompasses approximately 68 acres.

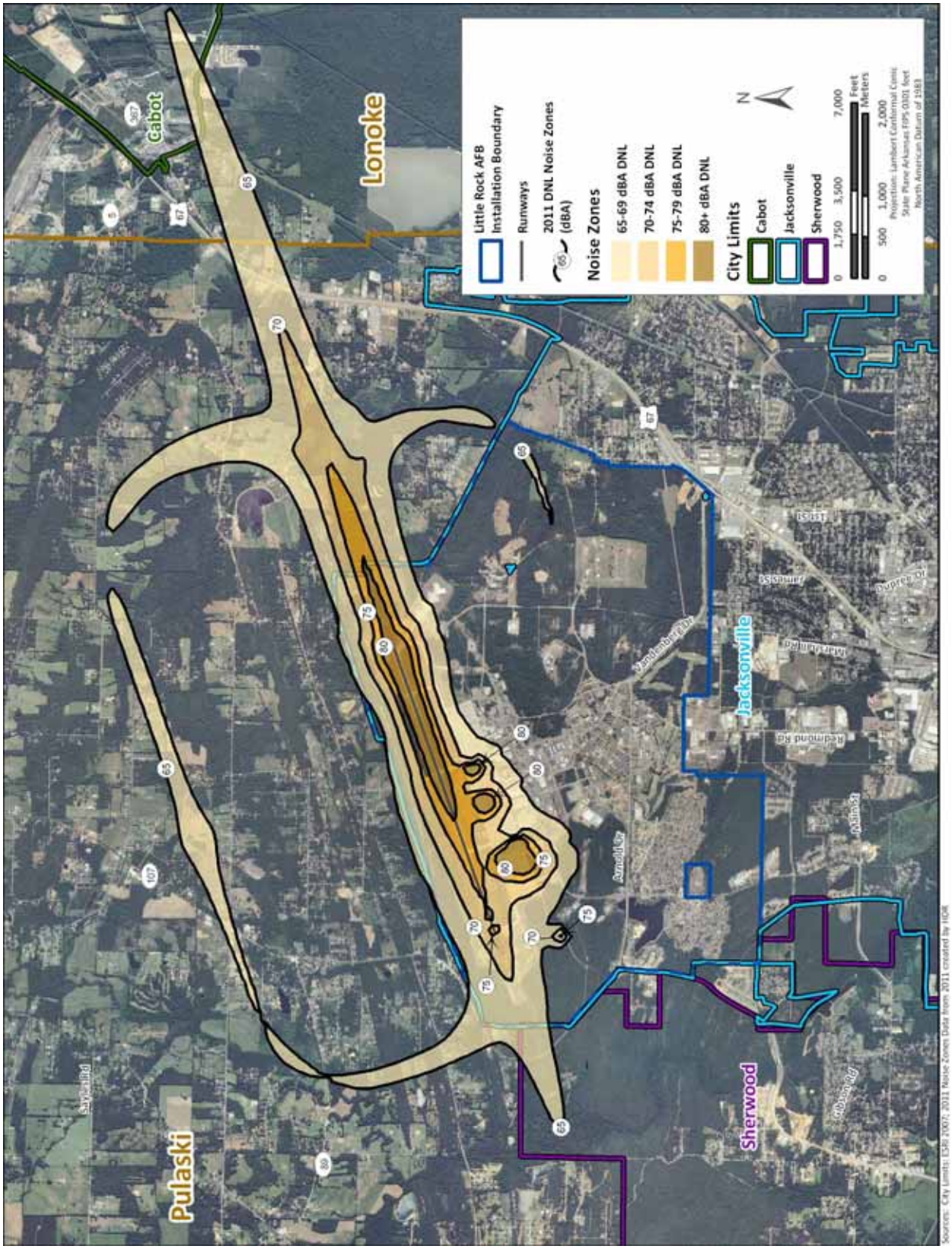

Figure 3-2. 2011 DNL Noise Zones at Little Rock AFB

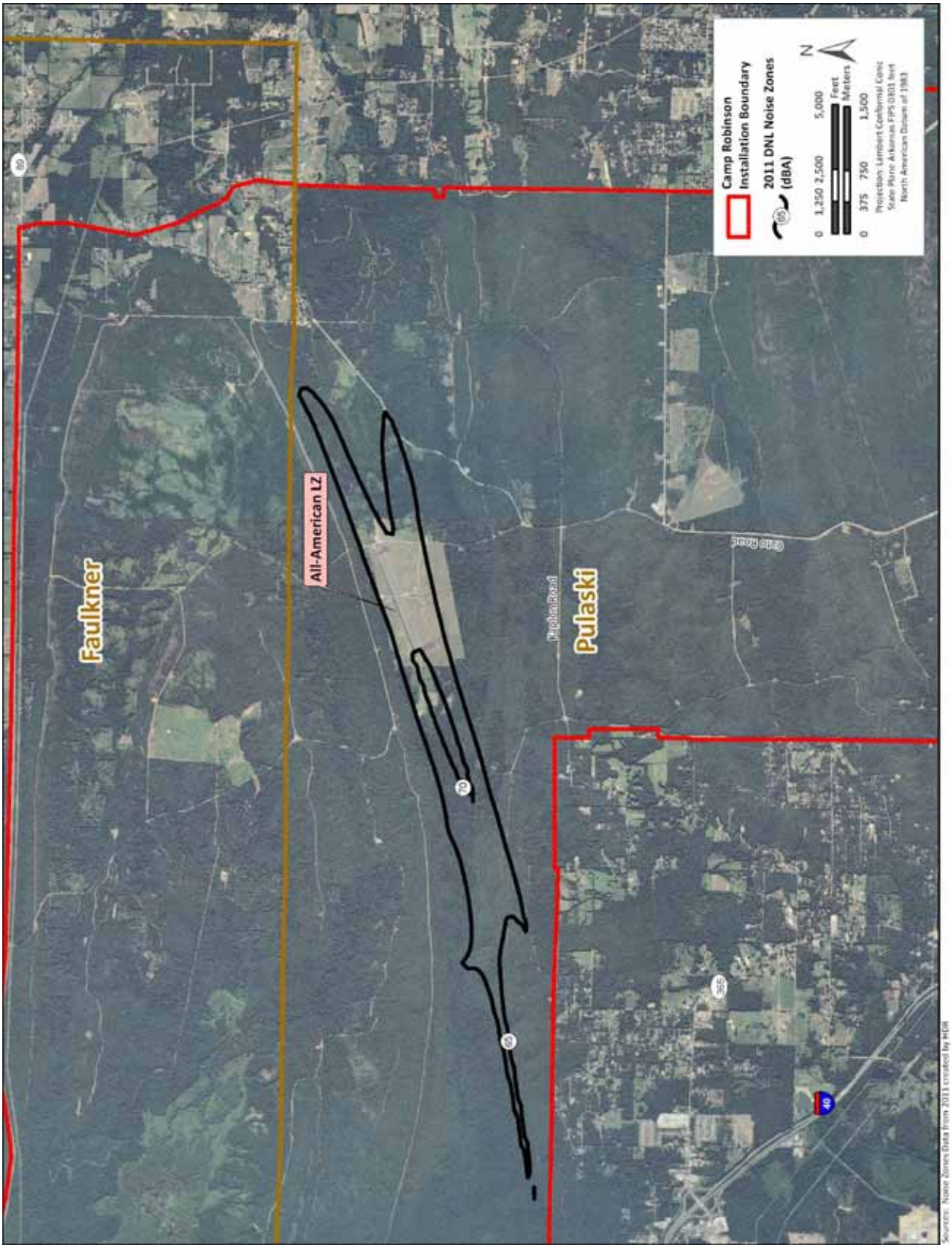

Figure 3-3. 2011 DNL Noise Zones at the All-American LZ

3.4 Accident Potential Zones

3.4.1 Little Rock AFB Airfield

Runway 07/25 Accident Potential Zones. DOD analyses have determined that the areas immediately beyond the ends of military runways and along the approach and departure flights paths have significant potential for aircraft accidents. Based on this analysis, DOD developed three zones that have high relative potential for accidents. The CZ, the area closest to the runway end, is the most hazardous. The overall risk is high enough that the DOD generally acquires the land through purchase in fee or acquiring restrictive easements to prevent development. As shown on **Figure 3-4**, both the eastern and western CZs are within the installation boundary.

APZ I is an area beyond the CZ that has significant potential for accidents. APZ II is an area beyond APZ I with a lesser, but still significant, potential for accidents. While aircraft accident potential in APZs I and II does not warrant acquisition by the USAF, land use planning and controls are strongly encouraged in these areas for the protection of the public. As shown on **Figure 3-4**, approximately 6 percent of the land in the eastern APZ I at Runway 07/25 is within the installation boundary, the remaining 94 percent of land in the eastern APZ I and all of the land in eastern APZ II is outside the installation boundary in Pulaski County. Approximately 19 percent of the land in the western APZ I at Runway 07/25 is within the installation boundary. The majority (approximately 65 percent) of the land in the western APZ I is within the City of Sherwood, the remaining 17 percent is within Pulaski County. All of the western APZ II is outside the installation boundary, approximately 65 percent of the land is within Pulaski County and approximately 35 percent is within the City of Sherwood. Each CZ encompasses an area 3,000 feet wide by 3,000 feet long. Each APZ I is 3,000 feet wide by 5,000 feet long and each APZ II is 3,000 feet wide by 7,000 feet long. Additional information on accident potential is contained in **Appendix B** of this report.

Assault Strip (Runway 069/249) Accident Potential Zones. Assault strips for C-130 aircraft are considered special use runways for warfighting or contingency response, as defined in United Facilities Criteria (UFC) 3-260-01, *Airfield and Heliport Planning and Design.* CZs, APZs, and an exclusion area were developed for USAF assault strips (DOD 2008).

Accident potential areas at assault strips and landing zones are provided in UFC 3-260-01, Airfield and Heliport Planning Criteria. UFC apply to all DOD airfields.

The CZ at the Little Rock AFB assault strip (Runway 069/249) is a trapezoidal shape, with a width of 270 feet at the runway end and flaring uniformly to a width of 500 feet, and is 500 feet long (DOD 2008). As shown in **Figure 3-4**, the eastern and western CZs at the assault strip (Runway 069/249) are within the Little Rock AFB installation boundary.

The APZ at the assault strip (Runway 069/249) is 500 feet wide and 2,500 feet long. As shown in **Figure 3-4**, the eastern and western APZs are also within the Little Rock AFB installation boundary.

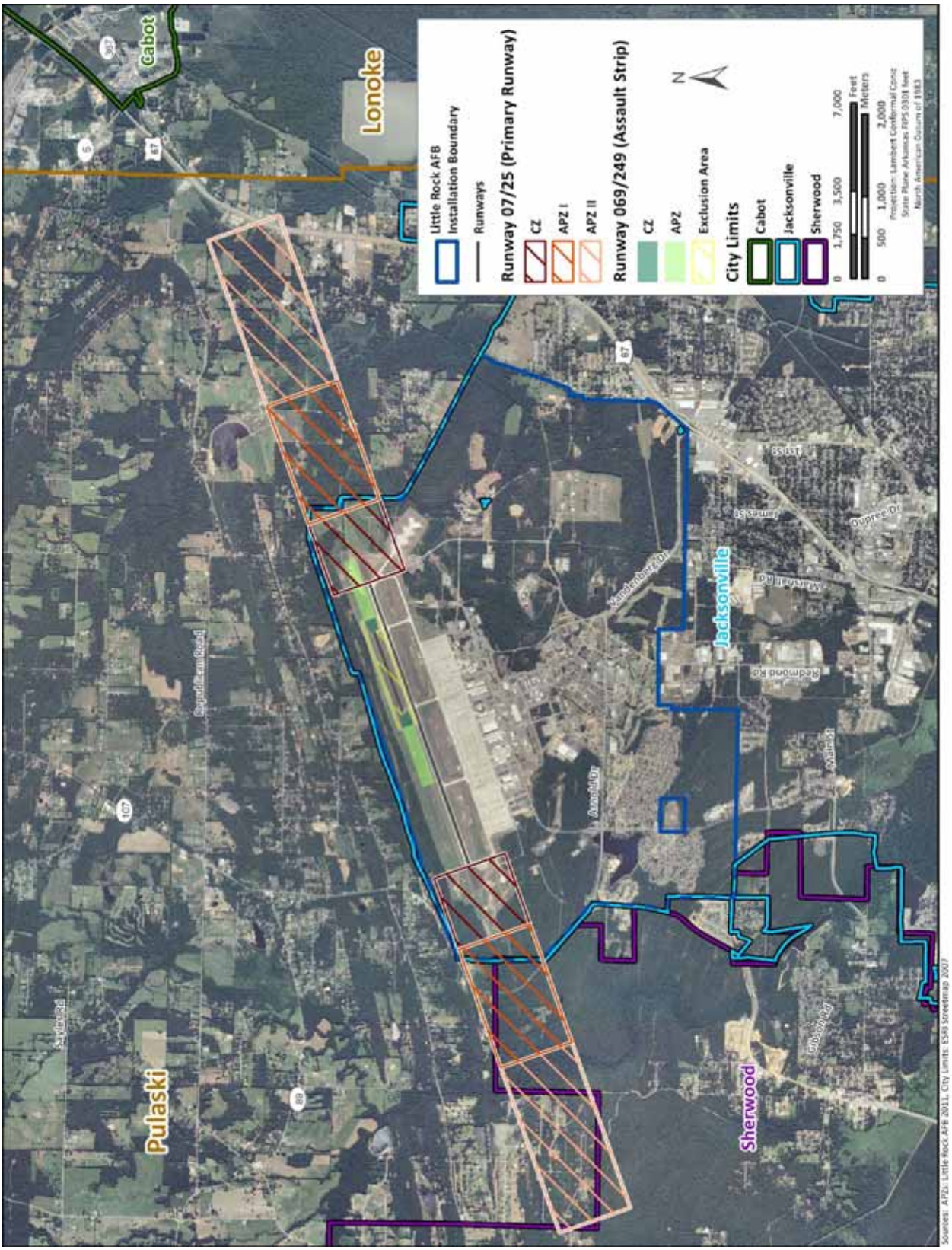

Figure 3-4. Clear Zones and Accident Potential Zones at Little Rock AFB

An exclusion area is required for all paved and semi-prepared (i.e., unpaved) assault strips (DOD 2008). The purpose of the exclusion area is to restrict the development of facilities around the assault strip. Only features required to operate the assault strip (e.g., taxiways, aprons, support equipment, and cargo loading and unloading areas) are allowed in the exclusion area. Non-operational land uses such as security forces, roads, parking lots, storage areas, and similar structures are not allowed. The exclusion area is centered on the assault strip and extends the length of the strip plus the CZ at each end. The exclusion area at the Little Rock AFB assault strip (Runway 069/249) is 700 feet wide, and 4,000 feet long (the length of the assault strip [3,500 feet] plus the length of the CZ [500 feet]). As shown in **Figure 3-4**, the exclusion area is within the Little Rock AFB installation boundary.

3.4.2 All-American Landing Zone Accident Potential Zones

The CZs and APZs at an LZ have the same dimensions as those for an assault strip (as defined in UFC 3-260-01). The CZ at the All-American LZ is a trapezoidal shape, with a width of 270 feet at the runway end and flaring uniformly to a width of 500 feet, and is 500 feet long (DOD 2008). As shown in **Figure 3-5**, the eastern and western CZs are within the Camp Robinson installation boundary. The APZ at the All-American LZ is 500 feet wide and 2,500 feet long. As shown in **Figure 3-5**, the eastern and western APZs are also within the Camp Robinson installation boundary.

The exclusion area at a LZ has the same dimensions and land use restrictions as those for an assault strip (as defined in UFC 3-260-01). Therefore, the same facility development restrictions discussed above for the Little Rock AFB assault strip (Runway 069/249) would also apply to the All-American LZ. The exclusion area is centered on the LZ and extends the length of the LZ plus the CZ at each end. The exclusion area at the All-American LZ is 700 feet wide, and 5,150 feet long (the length of the LZ [4,650 feet] plus the length of the CZ [500 feet]). As shown in **Figure 3-5**, the exclusion area is within the Camp Robinson installation boundary.

3.4.3 Blackjack Drop Zone Buffer Zone

The buffer zone at Blackjack DZ is 1,200 feet to the east and west, and 600 feet to the north and south.

In 1996, Little Rock AFB secured an unimproved land lease for the use of 719 acres in White County, Arkansas, to provide a buffer zone for the existing Blackjack DZ. As shown in **Figure 3-6**, the buffer zone extends from the DZ boundary 1,200 feet to the east and west and 600 feet to the north and south. The buffer zone was created to prevent residential development around the DZ, thereby minimizing the risk to human health and safety from airdrop operations (Little Rock AFB 1996). The land is leased to Little Rock AFB and the installation is responsible for any damage caused by airdrops within the buffer zone, such as damage to property from a pallet that did not land within the impact area.

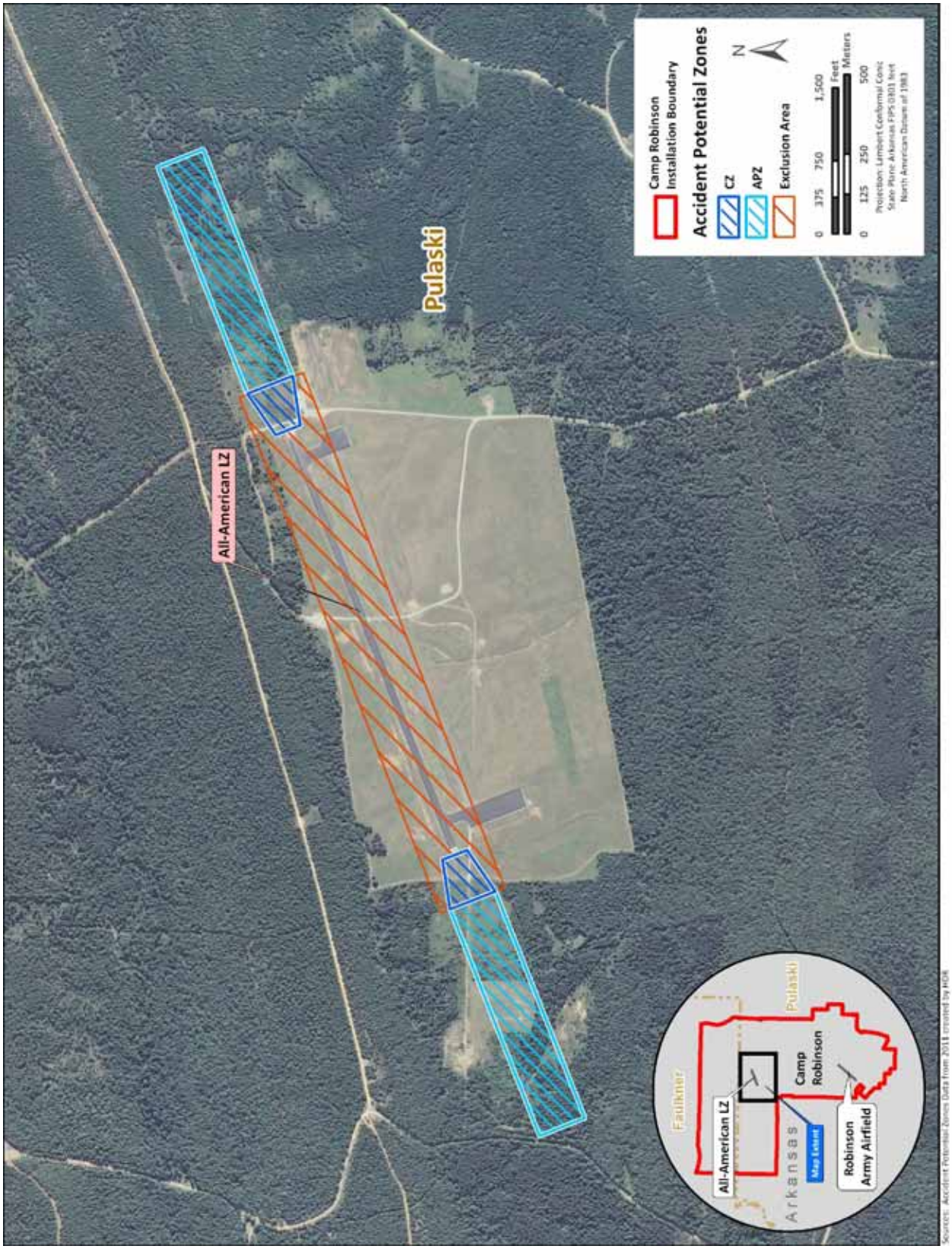

Figure 3-5. Clear Zones, Accident Potential Zones, and Exclusion Area at the All-American LZ

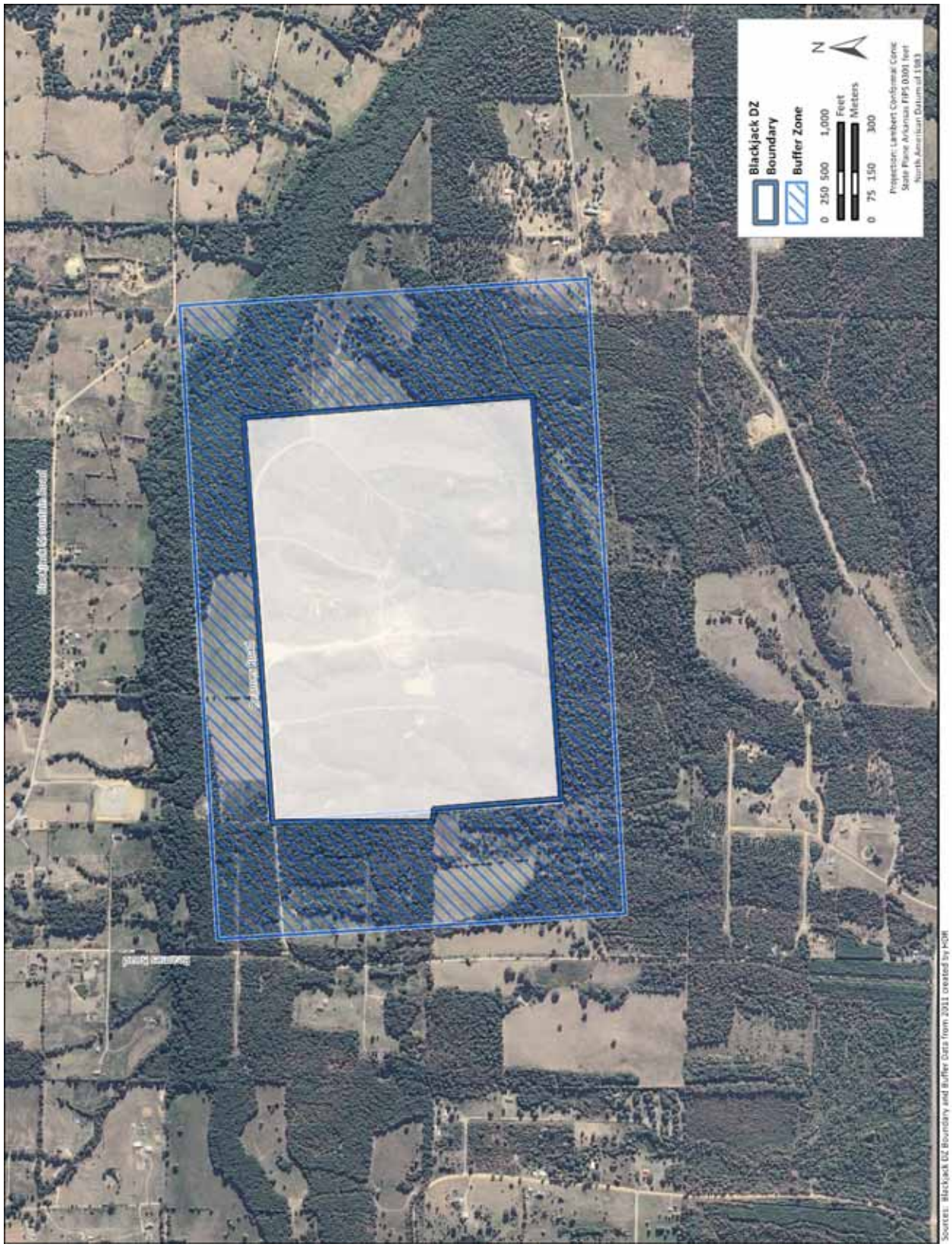

Figure 3-6. Buffer Zone at Blackjack Drop Zone

3.5 Land Use Compatibility Guidelines

This AICUZ Study contains general land use guidelines related to safety and noise associated with aircraft operations. **Table 3-2** lists the USAF land use compatibility guidelines in relation to noise zones and APZs. Noise guidelines presented in the table are the same as those published in the June 1980 publication by the Federal Interagency Committee on Urban Noise (FICUN) entitled *Guidelines for Considering Noise in Land Use Planning Control* (FICUN 1980). The USDOT publication *Standard Land Use Coding Manual* (SLUCM) has been used for identifying and coding land use activities in the compatibility table (USDOT 1965). The Legends and Notes section at the end of **Table 3-2** provides additional information on some of the land use compatibility guidelines. For example, in SLUCM row No. 11.11, Single units/detached, Y[1] (in APZ II) means land use and related structures are compatible without restriction at a suggested maximum density of one to two dwelling units per acre, possibly increased under a Planned Unit Development where maximum lot coverage is less than 20 percent. However, if Single units/detached are proposed or located in APZ II and the 75 dBA DNL noise zone or higher, since the land use and related structures are not compatible in the 75 dBA DNL noise zone or higher, this land use should be prohibited.

Table 3-2. USAF Land Use Compatibility Guidelines

Land Use		APZs			DNL Noise Zones			
SLUCM No.	**Name**	**CZ**	**APZ I**	**APZ II**	**65–69 dBA**	**70–74 dBA**	**75–79 dBA**	**80+ dBA**
10	**Residential**							
11	Household units							
11.11	Single units: detached	N	N	Y[1]	A[11]	B[11]	N	N
11.12	Single units: semidetached	N	N	N	A[11]	B[11]	N	N
11.13	Single units: attached row	N	N	N	A[11]	B[11]	N	N
11.21	Two units: side-by-side	N	N	N	A[11]	B[11]	N	N
11.22	Two units: one above the other	N	N	N	A[11]	B[11]	N	N
11.31	Apartments: walk-up	N	N	N	A[11]	B[11]	N	N
11.32	Apartments: elevator	N	N	N	A[11]	B[11]	N	N
12	Group quarters	N	N	N	A[11]	B[11]	N	N
13	Residential hotels	N	N	N	A[11]	B[11]	N	N
14	Mobile home parks or courts	N	N	N	N	N	N	N
15	Transient lodgings	N	N	N	A[11]	B[11]	C[11]	N
16	Other residential	N	N	N[1]	A[11]	B[11]	N	N
20-30	**Manufacturing**							
21	Food and kindred products: manufacturing	N	N[2]	Y	Y	Y[12]	Y[13]	Y[14]
22	Textile mill products: manufacturing	N	N[2]	Y	Y	Y[12]	Y[13]	Y[14]

Land Use		APZs			DNL Noise Zones			
SLUCM No.	**Name**	**CZ**	**APZ I**	**APZ II**	**65–69 dBA**	**70–74 dBA**	**75–79 dBA**	**80+ dBA**
20-30	**Manufacturing (continued)**							
23	Apparel and other finished products made from fabrics, leather, and similar materials: manufacturing	N	N	N[2]	Y	Y[12]	Y[13]	Y[14]
24	Lumber and wood products (except furniture): manufacturing	N	Y[2]	Y	Y	Y[12]	Y[13]	Y[14]
25	Furniture and fixtures: manufacturing	N	Y[2]	Y	Y	Y[12]	Y[13]	Y[14]
26	Paper and allied products: manufacturing	N	Y[2]	Y	Y	Y[12]	Y[13]	Y[14]
27	Printing, publishing, and allied industries	N	Y[2]	Y	Y	Y[12]	Y[13]	Y[14]
28	Chemicals and allied products: manufacturing	N	N	N[2]	Y	Y[12]	Y[13]	Y[14]
29	Petroleum refining and related industries	N	N	N	Y	Y[12]	Y[13]	Y[14]
31	Rubber and misc. plastic products: manufacturing	N	N[2]	N[2]	Y	Y[12]	Y[13]	Y[14]
32	Stone, clay, and glass products manufacturing	N	N[2]	Y	Y	Y[12]	Y[13]	Y[14]
33	Primary metal industries	N	N[2]	Y	Y	Y[12]	Y[13]	Y[14]
34	Fabricated metal products: manufacturing	N	N[2]	Y	Y	Y[12]	Y[13]	Y[14]
35	Professional, scientific, and controlling instruments; photographic and optical goods; watches and clocks: manufacturing	N	N	N[2]	Y	A	B	N
39	Miscellaneous manufacturing	N	Y[2]	Y[2]	Y	Y[12]	Y[13]	Y[14]
40	**Transportation, communications, and utilities**							
41	Railroad, rapid rail transit, and street railroad transportation	N[3]	Y[4]	Y	Y	Y[12]	Y[13]	Y[14]
42	Motor vehicle transportation	N[3]	Y	Y	Y	Y[12]	Y[13]	Y[14]
43	Aircraft transportation	N[3]	Y[4]	Y	Y	Y[12]	Y[13]	Y[14]
44	Marine craft transportation	N[3]	Y[4]	Y	Y	Y[12]	Y[13]	Y[14]
45	Highway and street right-of-way	N[3]	Y	Y	Y	Y[12]	Y[13]	Y[14]
46	Automobile parking	N[3]	Y[4]	Y	Y	Y[12]	Y[13]	Y[14]
47	Communications	N[3]	Y[4]	Y	Y	A[15]	B[15]	N
48	Utilities	N[3]	Y[4]	Y	Y	Y	Y[12]	Y[13]
49	Other transportation communications and utilities	N[3]	Y[4]	Y	Y	A[15]	B[15]	N

Land Use		APZs			DNL Noise Zones			
SLUCM No.	**Name**	**CZ**	**APZ I**	**APZ II**	**65–69 dBA**	**70–74 dBA**	**75–79 dBA**	**80+ dBA**
50	**Trade**							
51	Wholesale trade	N	Y[2]	Y	Y	Y[12]	Y[13]	Y[14]
52	Retail trade: building materials, hardware, and farm equipment	N	Y[2]	Y	Y	Y[12]	Y[13]	Y[14]
53	Retail trade: general merchandise	N	N[2]	Y[2]	Y	A	B	N
54	Retail trade: food	N	N[2]	Y[2]	Y	A	B	N
55	Retail trade: automotive, marine craft, aircraft, and accessories	N	Y[2]	Y[2]	Y	A	B	N
56	Retail trade: apparel and accessories	N	N[2]	Y[2]	Y	A	B	N
57	Retail trade: furniture, home furnishings, and equipment	N	N[2]	Y[2]	Y	A	B	N
58	Retail trade: eating and drinking establishments	N	N	N[2]	Y	A	B	N
59	Other retail trade	N	N[2]	Y[2]	Y	A	B	N
60	**Services**							
61	Finance, insurance, and real estate services	N	N	Y[6]	Y	A	B	N
62	Personal services	N	N	Y[6]	Y	A	B	N
62.4	Cemeteries	N	Y[7]	Y[7]	Y	Y[12]	Y[13]	Y[14,21]
63	Business services	N	Y[8]	Y[8]	Y	A	B	N
64	Repair services	N	Y[2]	Y	Y	Y[12]	Y[13]	Y[14]
65	Professional services	N	N	Y[6]	Y	A	B	N
65.1	Hospitals, nursing homes	N	N	N	A*	B*	N	N
65.1	Other medical facilities	N	N	N	Y	A	B	N
66	Contract construction services	N	Y[6]	Y	Y	A	B	N
67	Governmental services	N	N	Y[6]	Y*	A*	B*	N
68	Educational services	N	N	N	A*	B*	N	N
69	Miscellaneous services	N	N[2]	Y[2]	Y	A	B	N
70	**Cultural, entertainment, and recreational services**							
71	Cultural activities (including churches)	N	N	N[2]	A*	B*	N	N
71.2	Nature exhibits	N	Y[2]	Y	Y*	N	N	N
72	Public assembly	N	N	N	Y	N	N	N
72.1	Auditoriums, concert halls	N	N	N	A	B	N	N
72.11	Outdoor music shell, amphitheaters	N	N	N	N	N	N	N
72.2	Outdoor sports arenas, spectator sports	N	N	N	Y[17]	Y17	N	N
73	Amusements	N	N	Y[8]	Y	Y	N	N
74	Recreational activities (including golf courses, riding stables, water recreation)	N	Y[8,9,10]	Y	Y*	A*	B*	N
75	Resorts and group camps	N	N	N	Y*	Y*	N	N

Land Use		APZs			DNL Noise Zones			
SLUCM No.	**Name**	**CZ**	**APZ I**	**APZ II**	**65–69 dBA**	**70–74 dBA**	**75–79 dBA**	**80+ dBA**
70	**Cultural, entertainment, and recreational services (continued)**							
76	Parks	N	Y[8]	Y[8]	Y*	Y*	N	N
79	Other cultural, entertainment, and recreational activities	N	Y[9]	Y[9]	Y*	Y*	N	N
80	**Resources production and extraction**							
81	Agriculture (except livestock)	Y[16]	Y	Y	Y[18]	Y[19]	Y[20]	Y[20,21]
81.5 to 81.7	Livestock farming and animal breeding	N	Y	Y	Y[18]	Y[19]	Y[20]	Y[20,21]
82	Agriculture-related activities	N	Y[5]	Y	Y[18]	Y[19]	N	N
83	Commercial forestry activities and related services	N[5]	Y	Y	Y[18]	Y[19]	Y[20]	Y[20,21]
84	Commercial fishing activities and related services	N[5]	Y[5]	Y	Y	Y	Y	Y
85	Mining activities and related services	N	Y[5]	Y	Y	Y	Y	Y
89	Other resources production and extraction	N	Y[5]	Y	Y	Y	Y	Y

Sources: DODI 1977, FICUN 1980, and USDOT 1965

Legend:

SLUCM = Standard Land Use Coding Manual, USURA.

Y = Yes – Land uses and related structures are compatible without restriction.

N = No – Land use and related structures are not compatible and should be prohibited.

Y^X = Yes with restrictions – Land use and related structures generally compatible; see notes indicated by the superscript.

N^X = No with exceptions – See notes indicated by the superscript.

NLR = Noise Level Reduction (NLR) (outdoor to indoor) to be achieved through incorporation of noise attenuation measures into the design and construction of the structures.

A, B, or C = Land use and related structures generally compatible; measures to achieve NLR for A (65–69 dBA DNL), B (70–74 dBA DNL), C (75–79 dBA DNL) need to be incorporated into the design and construction of structures.

A*, B*, and C* = Land use generally compatible with NLR; however, measures to achieve an overall noise level reduction do not necessarily solve noise difficulties and additional evaluation is warranted. See appropriate notes below.

* = The designation of these uses as "compatible" in this zone reflects individual Federal agencies and program considerations of general cost and feasibility factors, as well as past community experiences and program objectives. Localities, when evaluating the application of these guidelines to specific situations, might have different concerns or goals to consider.

Notes:

1. Suggested maximum density of 1 to 2 dwelling units per acre, possibly increased under a Planned Unit Development where maximum lot coverage is less than 20 percent.
2. Within each land use category, uses exist where further deliberating by local authorities might be needed due to the variation of densities in people and structures. Shopping malls and shopping centers are considered incompatible use in any accident potential zone (CZ, APZ I, or APZ II).
3. The placement of structures, buildings, or aboveground utility lines in the CZ is subject to severe restrictions. In a majority of the CZs, these items are prohibited. See AFI 32-7063, *Air Installation Compatible Use Zone Program* (USAF 2005), and United Facilities Criteria 3-260-1, *Airfield and Heliport Planning Criteria* (DOD 2008), for specific guidance.
4. No passenger terminals and no major aboveground transmission lines in APZ I.
5. Factors to be considered: labor intensity, structural coverage, explosive characteristics, and air pollution.
6. Low-intensity office uses only. Meeting places, auditoriums, and the like are not recommended.
7. Excludes chapels.

Notes: (continued)

8. Facilities must be low-intensity.
9. Clubhouse not recommended.
10. Areas for gatherings of people are not recommended.
11. (a) Although local conditions might require residential use, it is discouraged in 65–69 dBA DNL noise zone and strongly discouraged within the 70–74 dBA DNL noise zone. The absence of viable alternative development options should be determined and an evaluation should be conducted prior to approvals indicating a demonstrated community need for residential use would not be met if development were prohibited in these zones.
    (b) Where the community determines the residential uses must be allowed, measures to achieve outdoor to indoor NLR for the 65–69 dBA DNL noise zone and the 70–74 dBA DNL noise zone should be incorporated into building codes and considered in individual approvals.
    (c) NLR criteria will not eliminate outdoor noise problems. However, building location and site planning, and design and use of berms and barriers can help mitigate outdoor exposure, particularly from near ground-level sources. Measures that reduce outdoor noise should be used whenever practical in preference to measures that only protect interior spaces.
12. Measures to achieve the same NLR as required for facilities within the 65–69 dBA DNL noise zone 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.
13. Measures to achieve the same NLR as required for facilities within the 70–74 dBA DNL noise zone 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.
14. Measures to achieve the same NLR as required for facilities within the 75–79 dBA DNL noise zone 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.
15. If noise-sensitive, use indicated NLR; if not, the use is compatible.
16. No buildings.
17. Land use is compatible provided special sound reinforcement systems are installed.
18. Residential buildings require the same NLR as required for facilities within the 65–69 dBA DNL noise zone.
19. Residential buildings require the same NLR as required for facilities within the 70–74 dBA DNL noise zone.
20. Residential buildings are not permitted.
21. Land use is not recommended. If the community decides the use is necessary, personnel should wear hearing protection devices.

3.6 Relationship between Noise and Annoyance Levels

Noise levels in residential areas vary depending on the housing density and location. The noise level in a quiet suburban residential area in the daytime is about 50 dBA DNL, which increases to 60 dBA DNL for an urban residential area, and 80 dBA DNL for the downtown area of a major city in the daytime (USEPA 1974). Studies of community annoyance in response to transportation noise (aircraft, street/expressway, and railroad) show that DNL correlates well with human annoyance. Most people are exposed to sound levels of 50 to 55 dBA DNL or higher on a daily basis.

Table 3-3 presents the percentage of people projected to be "highly annoyed" when exposed to various levels of noise measured in DNL. This table presents the results of more than a dozen studies of the relationship between noise and annoyance levels. The data shown provide a perspective on the level of annoyance that might be anticipated. For example, 12 to 22 percent of persons exposed on a long-term basis to 65–69 dBA DNL are expected to be highly annoyed by noise events.

Table 3-3. Percentage of Population Highly Annoyed by DNL Noise Zones

DNL Noise Zones	Percentage of Persons Highly Annoyed	
	Low	*High*
65–69 dBA	12	22
70–74 dBA	22	36
75–79 dBA	36	54
80+ dBA	> 54	

Source: Finegold et al. 1994

3.7 Participation in the Planning Process

As local communities prepare their land use plans, the USAF must be ready to provide additional data and information. At Little Rock AFB, the AICUZ Program Manager should be contacted regarding planning matters as they might affect, or be affected by, activities at Little Rock AFB. The AICUZ Program Manager will send out public news releases and participate in public hearings about the AICUZ Program, and educate local communities and their officials about it.

Please visit http://www.littlerock.af.mil/ for information on how to contact personnel at the installation.

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4. LAND USE ANALYSIS

4.1 Introduction

Land use planning and control is a dynamic, rather than static, process. The specific characteristics of land use determinants will always reflect, to some degree, the changing conditions of the economic, social, and physical environment of a community, and changing public concerns. The planning process accommodates this fluidity in that decisions are normally not based on boundary lines, but rather on more generalized area designations.

Research on aircraft accident potential, noise, and land use compatibility is ongoing at a number of Federal and other agencies. These studies and all other compatibility guidelines must not be considered inflexible standards. They are the framework within which land use compatibility questions can be addressed and resolved.

Computer technology enables Little Rock AFB to more precisely display its flight tracks and noise zones for land use planning purposes. This same technology allows the installation a means to communicate the extent to which Little Rock AFB's flight operation impacts extend into the cities of Cabot, Jacksonville, and Sherwood; and Lonoke, Pulaski, and White counties. For the purposes of this study, existing land uses within the Little Rock AFB 2011 DNL noise zones (see **Figure 4-1**) have been classified into the following categories:

- ***Commercial:*** Offices, retail, restaurants, businesses, and other types of commercial activity.
- ***Industrial:*** Areas and the facilities they contain that are owned or used for industrial purposes, such as manufacturing, warehousing, and other similar uses.
- ***Little Rock AFB:*** Land within the current Little Rock AFB installation boundary.
- ***No Data.*** Land that was not classified by the local municipalities. For the purpose of this AICUZ Study, the "no data" land use encompassed by the 2011 noise zones and APZs was reclassified based on aerial photography.
- ***Open-Space/Low-Density:*** Undeveloped land areas, forested land, agricultural land, grazing areas, water or wetland areas, and areas with residential activity at densities less than or equal to one dwelling per acre.
- ***Open-Space/Low-Density Floodplains:*** Floodplains consist of level land that could be submerged by floodwaters. Floodplains are normally classified as open-space/low-density land use. They are shown as a separate category in this AICUZ Study because the local municipalities discourage development within floodplains; therefore, the potential for development within these areas is low.
- ***Public/Semi-Public:*** Publicly owned lands or lands to which the public has access, such as public buildings, schools, churches, cemeteries, hospitals, or institutional facilities. This category also includes federally owned property in Pulaski County.
- ***Recreational***: Land areas designated for recreational activity, including local parks; wilderness areas and reservations; conservation areas; and areas designated for trails, hikes, camping, and other similar uses.
- ***Residential:*** All types of residential activity, such as single and multifamily residences and mobile homes, at a density greater than one dwelling unit per acre. While residences in the vicinity of the Blackjack DZ are not at densities greater than one dwelling per acre, individual residences are labeled as residential land use on **Figure 4-2** in order to identify potential noise-sensitive receptors.

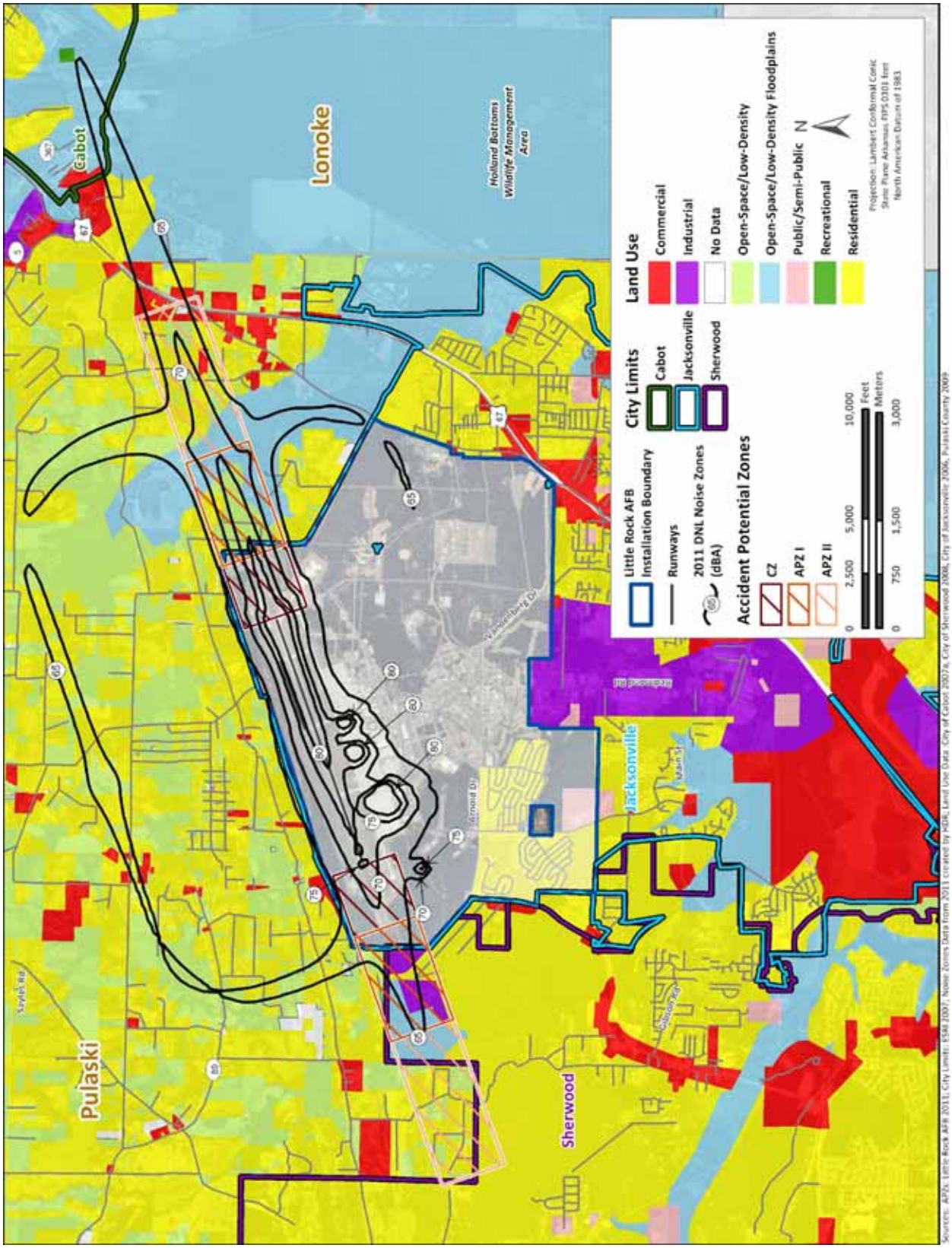

Figure 4-1. 2011 DNL Noise Zones and APZs at Little Rock AFB on Existing Land Use Map

Figure 4-2. Buffer Zone at Blackjack DZ on Existing Land Use Map

4.2 Existing Land Use

4.2.1 Introduction

Little Rock AFB was originally developed in a rural area in Pulaski County, Arkansas. As shown in **Table 2-1**, the cities near Little Rock AFB have grown significantly from 2000 to 2008. Growth in previously rural areas has increased, thereby impacting the land use around the installation. Current land use around Little Rock AFB is mixed, with the majority of the development to the south and southwest within the cities of Jacksonville and Sherwood, respectively.

Current land use around Little Rock AFB is mixed, with the majority of the development to the south and southwest within the cities of Jacksonville and Sherwood, respectively.

The 2011 DNL noise zones and APZs at Little Rock AFB are shown in **Figure 4-1** and are depicted on a land use map. The land use information illustrated on this map consists of the land use illustrated on the City of Cabot General Plan map (City of Cabot 2007a), 2006 land use data provided by the City of Jacksonville, 2008 land use data provided by the City of Sherwood, and 2009 tax assessor parcel data provided by Pulaski County because Pulaski County did not have an official land use map at the time of this AICUZ Study. The land use in Lonoke County shown in **Figure 4-1** was illustrated on the 2007 City of Cabot General Plan map because Lonoke County did not have land use data at the time of this AICUZ Study.

Noise Zones. A significant portion of the land encompassed by the 65–80+ dBA DNL noise zones is within the installation boundary (approximately 45 percent), followed by open-space/low-density use (see **Table 4-1**). However, residential land use is present within the 65–69 dBA DNL noise zone and within the 70–74 dBA DNL noise zone. There are 614 acres of residential land use within the 65–69 dBA DNL noise zone and 57 acres within the 70-74 dBA DNL noise zone for a total of 671 acres within the 2011 DNL noise zones. Additional land uses include commercial, industrial, and open-space/low-density floodplains.

Accident Potential Zones. As shown on **Figure 3-4**, the CZs and APZs at the assault strip (Runway 069/249) are within the installation boundary; therefore, they are not discussed in detail in this section. This section discusses the CZs and APZs at the Little Rock AFB main runway (Runway 07/25).

As shown in **Table 4-2**, both CZs are within the installation boundary. The majority of the land in the eastern APZ I and all of eastern APZ II are outside the installation boundary in Pulaski County. A small portion of land in eastern APZ I is within the installation boundary, the remainder is predominately open-space/low-density land use, a portion of a large open-space/low-density floodplain area, and residential land use in the north-central portion of the APZ. Land in the eastern APZ II also consists of a large open-space/low-density floodplain area, the remainder is a mix of open-space/low-density and residential uses and commercial land along Route 67.

Table 4-1. Off-Installation Land Use Acreage in Relation to 2011 DNL Noise Zones at Little Rock AFB

DNL Noise Zones	Land Use Category	Acres
65–69 dBA	Commercial*	66
	Industrial	59
	Open-Space/Low-Density*	552
	Open-Space/Low-Density Floodplain	495
	Residential	614
	Subtotal	*1,786*
70–74 dBA	Open-Space/Low-Density	96
	Open Space/Low Density Floodplain	107
	Residential	57
	Subtotal	*260*
75–79 dBA	Open-Space/Low-Density	63
	Open Space/Low Density Floodplain	6
	Subtotal	*69*
80+ dBA	Open-Space/Low-Density	2
	Subtotal	*2*
	Total	**2,117**

Note: * A total of 9 acres of "no data" land use in Pulaski County was classified as 5 acres of commercial use and 4 acres of open-space/low-density use based on aerial photography.

Table 4-2. Existing Off-Installation Land Use Acreage within the Little Rock AFB Accident Potential Zones

APZ	Land Use Category	Acres
Eastern End		
CZ	Off-Installation	0
APZ I	Open-Space/Low-Density	148
	Open Space/Low Density Floodplain	131
	Residential	37
	Subtotal	*316*
APZ II	Commercial*	35
	Open-Space/Low-Density	131
	Open Space/Low Density Floodplain	84
	Residential	219
	Subtotal	*469*
	Total	**785**
Western End		
CZ	Off-Installation	0
APZ I	Commercial	1
	Industrial	102
	Open-Space/Low-Density	45
	Open Space/Low Density Floodplain	87
	Residential	44
	Subtotal	*279*
APZ II	Open-Space/Low-Density	112
	Open Space/Low Density Floodplain	89
	Residential	263
	Subtotal	*464*
	Total	**743**

Note: * A total of 5 acres of "no data" land use in Pulaski County was classified as commercial use based on aerial photography.

Approximately 19 percent of the land in the western APZ I is within the installation boundary. The majority of the land within the western APZ I is in the City of Sherwood; this area includes large parcels of industrial and open-space/low-density floodplain land use and smaller residential parcels. The remainder of the land in the western APZ II is open-space/low-density and residential land use in Pulaski County. Land use in the western APZ II consists of open-space/low-density floodplain within the Sherwood city limits and a mix of open-space/low-density and residential land use in Pulaski County.

4.2.2 State of Arkansas

The State of Arkansas has several regulations regarding land use planning for local governments, and land use planning around military airfields. Arkansas Code 14-56-404 (Act 186 of 1957) states that a municipality may create a planning commission with the power to adopt and enforce plans for the development of the municipality and its environs. Per Arkansas Code 14-56-413 (Act 94 of 1989), the planning commission may create and enforce planning documents for the municipality's extraterritorial jurisdiction, which includes all land within 5 miles of the corporate limits. If the corporate limits of two or more municipalities are less than 10 miles apart, like the cities of Jacksonville and Sherwood, the limits of their respective extraterritorial jurisdictions is a line equidistant between them, or as agreed on by the respective municipalities (ACA 2009).

Arkansas Code 14-56-426 (Act 540 of 2005) stipulates that any city within which there lies, in whole or in part, an active-duty USAF installation must enact a city ordinance specifying that future land uses which might be hazardous to aircraft operation will be restricted or prohibited within the city's 5-mile extraterritorial jurisdiction. Within the 5-mile area, land uses are prohibited that cause any of the following (ACA 2009):

The authority for municipalities to adopt and enforce development plans is provided in Arkansas Code Title 14: Local Governments.

1. Release into the air of substances that would impair visibility or otherwise interfere with the operation of aircraft (i.e., steam, dust, or smoke)
2. Production of light emissions that would interfere with pilot vision
3. Production of electrical emissions that would interfere with aircraft communications systems or navigational equipment
4. Attraction of birds or waterfowl, including from the operation of sanitary landfills, maintenance of feeding stations, or the growing of certain vegetation
5. Structures within 10 feet of aircraft approach, departure, or transitional surfaces
6. Persons exposed to noise greater than 65 dBA DNL.

Arkansas Code 14-56-426 stipulates that the city ordinance must restrict or prohibit future uses within the 5-mile area that violate the height restriction criteria of FAR Part 77, Subpart C. The ordinance must be consistent with the recommendations of the 2003 AICUZ Study. This code specifically states that the city ordinance cannot prohibit single-family residential uses on tracts of 1 acre or more, provided that the future construction complies with *Guidelines for the Sound Insulation of Residences Exposed to Aircraft Operations*, Wyle Research Report 89-7 (ACA 2009). Information about this report can be found in **Appendix E** of this AICUZ Study.

4.2.3 City of Cabot

Land Use Policies. The *City of Cabot General Plan* was adopted in July 1999 and serves as official public statement by the City of Cabot for facilitating orderly growth and development within its territorial jurisdiction. The General Plan provides Cabot's history, topography, utility capacity, transportation systems, financial condition, existing infrastructure, and surrounding land use. The land use policies of the plan include promoting additional residential and commercial growth, avoiding "strip" type commercial development, and protecting existing neighborhoods from adverse land uses (City of Cabot 1999). The General Plan does not include any information directly pertaining to Little Rock AFB.

Existing Land Use. Approximately 76 acres of open-space/low-density floodplain land in the City of Cabot are exposed to noise levels of 65–69 dBA DNL under current operational conditions. The City of Cabot is not exposed to noise levels greater than 65 dBA DNL. However, as discussed in **Section 3.2.1**, noise zones are not static, but are dependent on aircraft type, number, performance, and flight path. As shown in **Figure 3-1**, the 2003 DNL noise zones did not impact land in the City of Cabot. The APZs also do not include land in the City of Cabot.

4.2.4 City of Jacksonville

Land Use Policies. The *Jacksonville Comprehensive Development Plan* was approved in 2004 and is an update to the original plan developed in March 1977. The plan provides the major policies concerning desirable future physical development and encompasses eight planning elements: safety, efficiency and economy, amenities, land uses, roadways, education, recreation, and utilities. The land use portion of the plan includes four general categories: residential, commercial, industrial, and mixed use (City of Jacksonville 2004a). Jacksonville has a planning commission per Arkansas Code 14-56-404, *Municipal Planning*, as discussed in **Section 4.2.2**.

The City of Jacksonville was founded in 1870 and is the 12th largest city in Arkansas. Little Rock AFB is within the Jacksonville city limits.

The housing area at Little Rock AFB, which is between Arnold Drive and General Samuels Road in the southwestern portion of the installation, was annexed by the City of Jacksonville in the 1970s. The remainder of Little Rock AFB, including the airfield, was annexed in 1993. The *Jacksonville Comprehensive Development Plan* states that the large land area occupied by Little Rock AFB limits the possible northward growth of the city. The plan

also identifies the city's floodplains as shown on **Figure 4-1** as limitations on the direction of growth, the plan states that the city avoids planning residential development in the floodplains. In compliance with Arkansas Code 14-56-426, the City of Jacksonville has an AICUZ Overlay District that provides for compatible uses of property within the Little Rock AFB AICUZ areas; this ordinance is discussed in **Section 4.3.3**.

Existing Land Use. With the exception of the land within the installation boundary (Little Rock AFB is within the Jacksonville city limits); the 2011 DNL noise zones and APZs do not encompass land in the City of Jacksonville.

4.2.5 City of Sherwood

Land Use Policies. The developed area in the City of Sherwood is approximated 6 miles southwest of Little Rock AFB. In early 2008 the City of Sherwood annexed the community of Gravel Ridge, a former census-designated place approximately 3 miles southwest of Little Rock AFB that is between the installation and the developed area of Sherwood. This annexation increased Sherwood's population by more than 3,000 residents, an increase of approximately 13 percent. This annexation also encompassed land within the western APZs. Land use planning documents for the City of Sherwood were not available at the time this AICUZ Study was written; however, the City of Sherwood does have a planning commission. In compliance with Arkansas Code 14-56-426, the City of Sherwood has a zoning ordinance that specifies compatible uses for property within the Little Rock AFB AICUZ areas. This ordinance is discussed in **Section 4.3.4**.

Sherwood became an incorporated city in 1948, and is the 16th largest city in Arkansas.

Existing Land Use. The City of Sherwood annexed the community of Gravel Ridge in early 2008; therefore, the Sherwood city limits shown on **Figure 4-1** include both municipalities. The 65–69 dBA DNL noise zone encompasses approximately 94 acres of industrial, open-space/low-density floodplains, and residential land use in northeastern Sherwood. The majority (approximately 65 percent) of the land in the western APZ I is in Sherwood. This area includes industrial, open-space/low-density floodplains, and residential uses. Approximately 35 percent of the land in the western APZ II is also in Sherwood, encompassing the remainder of the open-space/ low-density floodplain area from the western APZ I and residential land use.

4.2.6 Lonoke County

Land Use Policies. Land use planning documents for Lonoke County were not available at the time this AICUZ Study was written.

Existing Land Use. Lonoke County did not have land use data at the time this AICUZ Study was written; however, the 269 acres of land encompassed by the 65–69 dBA DNL noise zone in Lonoke County is illustrated on the City of Cabot General Plan map (City of Cabot 2007a) as open-space/low-density floodplain use.

4.2.7 Pulaski County

Land Use Policies. Land use planning documents for Pulaski County were not available at the time this AICUZ Study was written; however, the county does have other planning documents related to subdivisions and floodplains. The *Subdivision and Development Code of Pulaski County, Arkansas* was adopted in April 2009 (Pulaski County 2009). The code applies to subdivisions only and defines a subdivision as the division of a tract or parcel of land into two or more lots of less than 10 acres each for the purpose of immediate or future sale (Pulaski County 2009).

The *Pulaski County Floodplain and Flood Damage Prevention Ordinance of 2001* contains specific standards for residential and nonresidential construction, mobile homes, and recreational vehicles (Pulaski County 2001).

Existing Land Use. As shown in **Figure 4-1**, the majority of the land encompassed by the 2011 DNL noise zones outside the installation boundary is within Pulaski County. Directly west of Little Rock AFB are large parcels of industrial and open-space/low-density floodplain land use. Residential land is present south of these parcels and adjacent to the Jacksonville and Sherwood city limits. Another large floodplain area is present between the eastern installation boundary and Route 67, this floodplain area extends to the southeast into Lonoke County. The land north of Little Rock AFB includes a mix of open-space/low-density, residential, and a few commercial parcels; and some areas that were not classified by Pulaski County.

The All-American LZ used by Little Rock AFB airmen is west of the installation within Camp Robinson in northern Pulaski County. As shown on **Figure 3-3**, the 2011 DNL noise zones at the All-American LZ do not extend outside the Camp Robinson boundary, and therefore, do not encompass any other land uses within Pulaski County. The CZs and APZs at the All-American LZ are also within the Camp Robinson installation boundary.

4.2.8 Blackjack Drop Zone in White County

Land Use Policies. Land use planning documents for White County were not available at the time this AICUZ Study was written. Personnel at White County were not aware of any noise complaints as a result of aircraft operations at the Blackjack DZ.

Existing Land Use. As previously discussed, Little Rock AFB owns the Blackjack DZ in White County, Arkansas, which is used for C-130 airdrop operations. The DZ is approximately 2.3 miles southeast of Romance, Arkansas. White County is primarily rural and Romance is an unincorporated community with a population of 1,732 at the time of the 2000 census (U.S. Census Bureau 2000).

The DZ encompasses approximately 304 acres. Noise from aircraft operations does not reach 65 dBA DNL at Blackjack DZ; therefore, the noise zones are not shown on **Figure 4-2**. Noise levels of less than 65 dBA DNL do not meet the threshold for which the USAF and DOD feel land use

Blackjack DZ is located in a sparsely populated area of western White County, approximately 19 miles northeast of Little Rock AFB.

controls are necessary. However, noise levels of less than 65 dBA DNL do not mean that persons in the area would not hear aircraft. The land use around Blackjack DZ is shown for planning purposes in case the aircraft type, number of operations, or flight tracks at Little Rock AFB change in the future. Should a new mission be established that adds a larger number of aircraft or different aircraft types at Little Rock AFB, this AICUZ Study would be updated.

As discussed in **Section 4-1**, the USAF land use compatibility guidelines indicate that residential land use includes all types of residential activity at a density greater than one dwelling per acre. While residences in the vicinity of the Blackjack DZ are not at densities greater than one dwelling per acre, individual residences are shown as residential land use on **Figure 4-2** in order to identify potential noise-sensitive receptors. As discussed in **Section 3.4.3**, a 1,200-foot-by-600-foot buffer zone surrounds the Blackjack DZ. No residential land use is encompassed by this buffer zone. Parcels of residential land use are present north of the DZ along Blackjack Mountain Road and to the west and northwest near Reames Road. The remainder of the land in the vicinity of the Blackjack DZ is open-space/low-density.

4.3 Existing Zoning

4.3.1 Introduction

Figure 4-3 illustrates the zoning applicable to the cities of Cabot, Jacksonville, and Sherwood. Lonoke and Pulaski counties adjacent to Little Rock AFB and White County, where the Blackjack DZ is, did not have zoning at the time this AICUZ Study was written. Overall, the majority of the land within the 2011 DNL noise zones and APZs at Little Rock AFB is unzoned (50 percent and 57 percent, respectively). The All-American LZ is west of Little Rock AFB within the Camp Robinson installation boundary in Pulaski County; the land surrounding the LZ is unzoned.

Noise Zones. Approximately 31 percent of the land within the 65–69 dBA DNL noise zone is within the installation boundary and is zoned as an air force base district by the City of Jacksonville. The majority (approximately 63 percent) of the land within the 65–69 dBA DNL noise zone is unzoned in Pulaski and Lonoke counties. The remaining acreage includes multiple zoning districts in the cities of Cabot and Sherwood. The majority of the land exposed to noise levels of 70 dBA DNL or greater lies within the installation boundary and is zoned as an air force base district by the City of Jacksonville. The off-installation land exposed to noise greater than 70 dBA DNL is unzoned land in Pulaski County.

Accident Potential Zones. As shown on **Figure 3-5**, the CZs and APZs at the All-American LZ are within the Camp Robinson installation boundary; therefore, they are not discussed in this section. As shown on **Figure 3-4**, the CZs and APZs at the assault strip (Runway 069/249) are within the Little Rock AFB installation boundary; therefore, they are not discussed in detail in this section. This section discusses the CZs and APZs at the Little Rock AFB main runway (Runway 07/25).

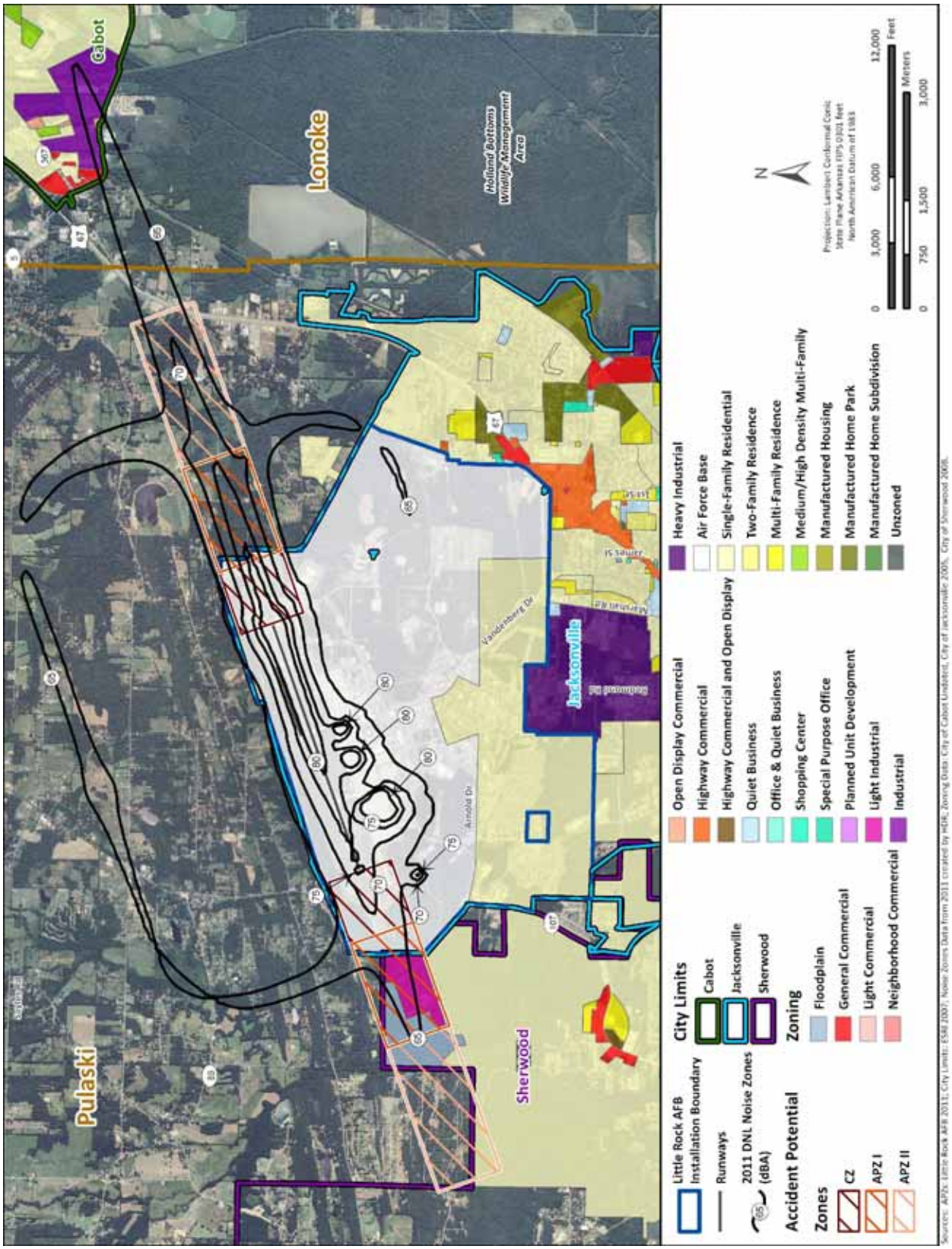

Figure 4-3. 2011 DNL Noise Zones and APZs on Zoning Map

The land within the eastern and western CZs is within the Little Rock AFB installation boundary and is part of the Jacksonville air force base zoning district that covers most of the installation. The majority of the land within the eastern APZ I and all the land within the eastern APZ II is unzoned within Pulaski County. Approximately 19 percent of the land in the western APZ I is zoned air force base, the remainder includes light industrial, floodplain, and single-family residence zoning in the City of Sherwood and unzoned land in Pulaski County. The majority of the land in the western APZ II is unzoned in Pulaski County and the remainder is zoned floodplain and single-family residence in the City of Sherwood.

4.3.2 City of Cabot

Zoning Policies. The *City of Cabot, Arkansas Zoning Code* was adopted, in part, in 2007 to implement the land use portion of the Cabot General Plan (City of Cabot 2007b). The zoning code regulates lot coverage; the height, area, bulk, location, and size of buildings; open space; and the uses of land, buildings, and structures. The zoning code consists of 13 zoning districts, including 7 types of residential districts; and business, commercial, and industrial districts. The zoning code also describes the three methods that new territories may be annexed into the city (election, petition, and the annexation of islands by city ordinance) (City of Cabot 2007b). This code does not include any information directly pertaining to Little Rock AFB.

Existing Zoning. As shown in **Figure 4-3**, the 65–69 dBA DNL noise zone encompasses approximately 76 acres in the City of Cabot. This land is predominately zoned industrial, along with smaller parcels of general commercial and open-display commercial zoning.

4.3.3 City of Jacksonville

Zoning Policies. The *Official Zoning Ordinance of the City of Jacksonville, Arkansas* was enacted in 1969 and was most recently updated in 2004. The ordinance regulates lots, structures, and uses within the City of Jacksonville corporate limits. The zoning ordinance includes 17 zoning districts, such as multiple types of residential, commercial, and industrial districts; and several overlay districts (City of Jacksonville 2004b). As shown in **Figure 4-3**, Little Rock AFB is within the Jacksonville city limits, the northern and eastern portions of the installation are zoned as an air force base district and the southern portion (the military family housing) is zoned as one-family residences.

The Jacksonville AICUZ overlay district regulations prohibit the same land uses as Arkansas Code 14-56-426 (Act 540 of 2005). In addition, Jacksonville also prohibits the growth of vegetation that would inhibit the safe operation of aircraft at Little Rock AFB.

Chapter 18.66 of the zoning ordinance, *AICUZ Air Installation Compatible Use Zone*, was enacted in 1999 and defines the AICUZ overlay district for the City of Jacksonville. The overlay district regulations supersede those of the underlying zoning districts. The purposes of the overlay district include the following (City of Jacksonville 2004b):

1. Provide for the health, safety, and welfare of the citizen in compliance with Arkansas Law (Arkansas Code 14-56-426) and the AICUZ Study for Little Rock AFB

2. Address environmental concerns created by violations of the overlay district provisions
3. Preserve and enhance the economic value of the property within the overlay district.

The overlay district applies to the future development and use of land within the CZ, APZ I, and APZ II. As authorized under Arkansas Code, the Jacksonville AICUZ overlay district applies to this property even though the majority of it is outside the Jacksonville corporate limits. The overlay district regulations do not apply to subdivisions that existed prior to 1999 (City of Jacksonville 2004b).

Per the overlay district density restrictions, residential housing within the CZ, APZ I, and APZ II is permitted at no more than one dwelling per acre. Future land uses are reviewed for population density concerns to ensure the recommendations of the AICUZ Study are addressed. Construction must comply with Southern Building Code to provide sound insulation and protection from levels exceeding 75 dBA DNL in the CZ, APZ I, and APZ II (City of Jacksonville 2004b).

The Jacksonville overlay district regulations prohibit the same land uses as Arkansas Code 14-56-426, with the exception that uses may not expose persons to noise greater than 75 dBA DNL. As discussed in **Section 4.2.2**, the Arkansas Code prohibits uses that expose persons to noise greater than 65 dBA DNL. In addition, the Jacksonville overlay district regulations also prohibit the growth of vegetation that would inhibit the safe operation of aircraft at Little Rock AFB.

Existing Zoning. With the exception of the land within the installation boundary, the 2011 DNL noise zones and APZs do not encompass land in the City of Jacksonville. Little Rock AFB is within the Jacksonville city limits; therefore, the city has zoned the land within the installation boundary. The northern and eastern portions of the installation (including the flightline) is zoned as an air force base district and the military family housing in the southern portion of the installation is zoned as single-family residences. The land within the eastern and western CZs is completely within the installation boundary and is part of the air force base zoning district. A portion of the eastern and western APZs is also within the installation boundary; this land is also zoned as an air force base district.

Little Rock AFB is within the Jacksonville city limits. The northern and eastern portions of the installation are zoned as air force base district and the military family housing in the southern portion of the installation is zoned as single-family residences.

4.3.4 City of Sherwood

Zoning Policies. The *Zoning Ordinance of the City of Sherwood, Arkansas* became effective on 28 May 1986 and addresses the development within the corporate limits of the City of Sherwood. One of the purposes of the zoning ordinance is to control overcrowding. The zoning ordinance includes 14 zoning districts, such as multiple types of residential, commercial, and industrial districts (City of Sherwood 1986). As discussed in **Section 4.3.3**, Little Rock AFB is within the Jacksonville city limits and is therefore not zoned by the City of Sherwood.

The Arkansas Code 14-56-426 directed the City of Jacksonville to enact an ordinance specifying compatible land uses lying within the Little Rock CZ and APZs; Jacksonville complied and created their AICUZ overlay district. Part of the land in the western CZ and APZs was annexed into the City of Sherwood; therefore, Sherwood enacted their own AICUZ overlay district via Ordinance 1744 on 23 July 2007 (City of Sherwood 2007). The Sherwood AICUZ overlay district regulations are very similar to Jacksonville's, including prohibiting the same land uses as Arkansas Code 14-56-426. The Sherwood AICUZ overlay district prohibits uses that expose persons to noise greater than 65 dBA DNL, whereas the Jacksonville AICUZ overlay districts restricts uses of greater than 75 dBA DNL (City of Sherwood 2007).

Existing Zoning. Sherwood is directly west of Little Rock AFB and the western APZ I and APZ II includes land within the city limits. Approximately 223 acres of the land in western APZ I is in Sherwood and consists of land zoned for floodplain, light industrial, and single-family residence. Approximately 169 acres of the land in the western APZ II is also in Sherwood, this land consists of land zoned for floodplains and single-family residence zoning.

4.3.5 Lonoke County

Zoning Policies. As discussed in **Section 4.4.4**, unincorporated land in Lonoke County was not zoned at the time this AICUZ Study was written; therefore, Lonoke County does not have any zoning policies.

Existing Zoning. As shown in **Figure 4-3**, the 65–69 dBA DNL noise zone encompasses approximately 269 acres of unzoned land in Lonoke County.

4.3.6 Pulaski County

Zoning Policies. As discussed in **Section 4.4.3**, unincorporated land in Pulaski County was not zoned at the time this AICUZ Study was written; therefore, Pulaski County does not have any zoning policies.

Existing Zoning. As shown in **Figure 4-3**, the 65–69 dBA DNL noise zone encompasses approximately 1,384 acres of land in Pulaski County that is unzoned. The cities of Jacksonville and Sherwood in Pulaski County zone the land within their corporate limits.

4.3.7 Blackjack Drop Zone in White County

Unincorporated land in White County was not zoned at the time this AICUZ Study was written.

The three counties affected by Little Rock AFB aircraft operations (Lonoke, Pulaski, and White) did not have land use or zoning planning documents at the time this AICUZ Study was written. It is recommended that county community planners act consistently with the USAF-recommended land use compatibility guidelines when they are developing their land use plans and zoning regulations.

4.4 Future Land Use

As discussed in **Section 4.2.3**, one of the goals of the *City of Cabot General Plan* is to promote additional residential growth. The vast majority (88 percent) of the land within the Cabot planning area boundary is designated for low-density residential use, which as defined in the General Plan as no more than 3.5 dwellings per acre (City of Cabot 1999). USAF guidelines consider low-density residential use at densities less than or equal to one dwelling per acre. However, the noise zones from aircraft operations at Little Rock AFB only encompass a small portion of land in the City of Cabot, which is currently zoned industrial, along with smaller parcels of general commercial and open-display commercial zoning. It is recommended that the City of Cabot act consistently with USAF-recommended land use compatibility guidelines in relation to noise zones (see **Table 3-2**) when developing land in the western portion of the city.

The cities of Jacksonville and Sherwood land use planning documents include future land uses that have the potential to be incompatible with the Little Rock AFB AICUZ environs. Per the Jacksonville Land Use Plan Map, the residential areas shown on **Figure 4-1** include the existing residential development which occupies 7,843 acres in Jacksonville, and additional vacant land which, if developed at the densities of the existing areas, would accommodate the city's projected 2025 population (City of Jacksonville 2004a). In northern Jacksonville, areas that are currently vacant but are identified in the Jacksonville Land Use Plan Map as available for residential development include land west of the existing industrial area along Redmond Road to the city limits, west and north of Route 67 to the city limits, and east of Northeastern Avenue to the Lonoke County line. If developed as residential properties at high densities, these areas could be incompatible with future Little Rock AFB operations. It is recommended that the City of Jacksonville act consistently with USAF-recommended land use compatibility guidelines in relation to APZs and noise zones when developing these areas.

It is recommended that local municipalities act consistently with USAF-recommended land use compatibility guidelines in relation to APZs and noise zones (see Table 3-2) when considering developing the land near Little Rock AFB, the All-American LZ, and the Blackjack DZ.

Similar to the City of Jacksonville, the residential land use in Sherwood shown on **Figure 4-1** includes current residential areas and vacant land that the city has allocated for future residential development. Per the Sherwood zoning ordinance, land that is annexed into the city is zoned Single Family Residence until the official zoning map is amended to include such areas in other zoning districts (City of Sherwood 1986). Therefore, the majority of the community of Gravel Ridge, which is directly west of Little Rock AFB and was annexed into Sherwood in 2008, is classified as residential land use and is zoned residential. The Gravel Ridge annexation included approximately 65 percent of land in the western APZ I and approximately 35 percent of land in the western APZ II, and all the property to the south of the APZs. The majority of the land in the western APZ I is open-space/low-density floodplain and industrial land use, however approximately 35 acres of currently vacant lands is designated by Sherwood as available for residential development. An additional 81 acres of currently vacant land use is available for residential development in the western

APZ II. Residential land use is considered incompatible in any APZ. It is recommended that the City of Sherwood act consistently with the USAF-recommended land use compatibility guidelines in relation to noise zones and APZs when developing these areas (see **Table 3-2**).

The City of Sherwood draft land use and zoning maps also illustrate several proposed roadways near Little Rock AFB (City of Sherwood 2008a, City of Sherwood 2008b). This includes a collector (i.e., a low- or moderate-capacity road) extending Arnold Drive west through Gravel Ridge (now part of Sherwood) into the community of Gibson; the proposed collector would traverse the southwestern corner of western APZ II. A collector is also proposed to connect General Samuels Road to the new Arnold Drive extension, and another collector connecting Jacksonville-Cato Road to the new Arnold Drive extension. These collectors would traverse the currently vacant area in Gravel Ridge which is considered an area of future residential growth for the City of Sherwood. A freeway is also proposed north of Oak Dale Road, connecting Jacksonville with North Little Rock. While the majority of these roadways are not within the Little Rock AFB AICUZ environs, new roads could open previously undeveloped areas to potentially incompatible land uses. It is recommended that the City of Sherwood ensure that future transportation plans would not attract incompatible development that could impact Little Rock AFB's ability to fulfill its mission requirements.

4.5 Incompatible Land Uses

The USAF established compatible land use guidelines in relation to noise zones and APZs to determine if land uses around an installation were compatible in the AICUZ environs. The compatibility status of the land within the 2011 DNL noise zones and APZs was determined by taking the land use categories presented in **Figure 4-1**, choosing the respective land use classifications from **Table 3-2**, and applying the applicable land use compatibility. For a land use to be considered compatible, it must meet criteria for its category for both noise and accident potential. In general, the USAF's land use compatibility guidelines recommend that noise-sensitive land uses be placed outside high-noise zones, and that people-intensive uses not be placed in APZs. There are land uses north and northeast of Little Rock AFB that are considered to be incompatible with the installation's aircraft operations.

The compatibility status of the land within the 2011 DNL noise zones and APZs was determined by taking the land use categories presented in Figure 4-1, choosing the respective land use classifications from Table 3-2, and applying the applicable land use compatibility.

4.5.1 Noise Zones

All of the land within the 2011 DNL noise zones at the All-American LZ is within the Camp Robinson installation boundary. Aircraft operations at the Blackjack DZ do not generate noise levels of 65 dBA DNL or greater. Therefore, only the compatibility for the land uses encompassed by the Little Rock AFB 2011 DNL noise zones are discussed in detail in this section. As shown in **Table 4-3**, a total of 671 acres of land is considered incompatible within the 2011 DNL noise zones. The only land use that is considered incompatible within the 2011 DNL noise zones and APZs is residential.

Table 4-3. Residential Land Use within the 2011 DNL Noise Zones

DNL Noise Zones	Residential Land Use (Acres)
65–69 dBA	614
70–74 dBA	57
75–79 dBA	0
80+ dBA	0
Total	**671**

65–69 dBA DNL Noise Zone. Approximately 34 percent (614 acres) of the land outside of the installation boundary that is within the 65–69 dBA DNL noise zone consists of residential land use north and east of the installation in Pulaski and Lonoke counties. USAF land use compatibility guidelines recommend that local municipalities determine that there is an absence of viable alternative development options before approving residential development within the 65–69 dBA DNL noise zone. The municipality's evaluation of new construction proposals should indicate that the community's need for residential use would not be met if development were prohibited in this noise zone. When the community determines that residential land uses must be allowed, measures to achieve outdoor to indoor noise level reduction (NLR) should be incorporated into building codes and considered in individual construction approvals. NLR measures will reduce indoor noise levels; however, NLR measures will not eliminate outdoor noise problems. Measures that reduce outdoor noise (e.g., careful site planning and the use of berms or barriers) should be used whenever practical in addition to measures that protect interior spaces.

Approximately 7 percent of the land outside of the installation boundary that is within the 65–69 dBA DNL noise zone consists of industrial land use directly west of the installation in the City of Sherwood and commercial land use to the northeast in Pulaski County. These land uses and related structures are considered compatible without restriction.

The remainder of the land outside of the installation boundary that is within the 65–69 dBA DNL noise zone consists of open-space/low-density land use in Pulaski County and open-space/low-density floodplain land use in Pulaski County and the City of Cabot. These land uses are north and northeast of the installation, respectively, as shown in **Figure 4-1**. As discussed in **Section 4.1**, local municipalities discourage development within floodplains; therefore, the potential for development within these areas is low. If development is proposed in these areas, it is recommended that the USAF land use guidelines be followed.

70–74 dBA DNL Noise Zone. The vast majority (approximately 78 percent) of the land outside of the installation boundary that is within the 70–74 dBA DNL noise zone consists of open-space/low-density and open-space/ low-density floodplain land uses northeast of the installation in Pulaski County. If development is proposed in these areas, it is recommended that the USAF land use guidelines be followed.

Residential land use is considered incompatible within the 70–74 dBA DNL noise zone. As shown in **Table 4-3**, there are 57 acres of residential land west of Peters Road in Pulaski County. Residential land use is strongly discouraged within the 70–74 dBA DNL noise zone; however if the community approves residential development, residences would require the same NLR measures as those discussed for the 65–69 dBA DNL noise zone.

75–79 dBA DNL Noise Zone. All of the land outside of the installation boundary that is within the 75–79 dBA DNL noise zone consists of open-space/low-density and open-space/low-density floodplain uses directly east of the runway centerline in Pulaski County, which is considered compatible. If development is proposed in these areas, it is recommended that the USAF land use guidelines be followed.

80+ dBA DNL Noise Zone. Due to high noise levels, virtually all land uses are considered incompatible within the 80+ dBA DNL noise zone. Only 1 percent of the land within the 80+ dBA DNL noise zone is outside of the installation boundary, this includes 2 acres of open-space/low-density land use directly east of the runway centerline in Pulaski County. Open space is considered compatible within the 80+ dBA DNL noise zone; however other types of land uses included in the open-space/low-density land use category, such as agriculture and livestock farming, are not recommended. If the community decides these uses are necessary, personnel should wear hearing protection devices. Residences are not permitted in this noise zone.

4.5.2 Accident Potential Zones

As shown on **Figure 3-5**, the CZs and APZs at the All-American LZ are within the Camp Robinson installation boundary. At the Blackjack DZ, only open-space/low-density land use is present within the buffer zone, which is considerable compatible. At Little Rock AFB, the CZs and APZs at the assault strip (Runway 069/249) are within the installation boundary (see **Figure 3-4**). Therefore, only the land use compatibility within the Little Rock AFB APZs at Runway 07/25 is discussed in detail in this section. As shown in **Table 4-4**, a total of 563acres of land is considered incompatible within the APZs. The only land use that is considered incompatible within the APZs is residential.

Table 4-4. Residential Land Use within the APZs

APZ	Residential Land Use (Acres)
Eastern End	
CZ	0
APZ I	37
APZ II	219
Subtotal	*236*
Western End	
CZ	0
APZ I	44
APZ II	263
Subtotal	*307*
Total	**563**

Eastern APZs

Eastern CZ. The land in the eastern CZ is completely within the installation boundary.

Eastern APZ II. As shown in **Table 4-4**, approximately 37 acres of residential land use are considered incompatible in eastern APZ I. This includes residences east of County Road 70 in Pulaski County. The remainder of the land within the southern APZ I is considered compatible with USAF land use guidelines, this includes 148 acres of open-space/low-density and open-space/low-density floodplain land uses in Pulaski County.

Eastern APZ II. Approximately half of the land in the eastern APZ II consists of open-space/low-density and open-space/low-density floodplain land east and west of Peters Road that are considered compatible. There are 35 acres of commercial land directly west of Route 67. Low-density commercial land use is considered compatible in APZ II; however, any additional high-density development such as a shopping mall would be considered incompatible. The 219 acres of residential land use east and west of Peters Road are considered incompatible (see **Table 4-4**).

Western APZs

Western CZ. The land in the western CZ is completely within the installation boundary.

Western APZ I. The majority (approximately 84 percent) of the land within the western APZ I is considered compatible with USAF land use guidelines; this includes open-space/low-density, commercial, industrial, and open-space/low-density floodplain land use. However, further deliberation of industrial and commercial land uses by municipal planners could be needed due to variation in the densities of persons and structures. For example, shopping malls and shopping centers are considered an incompatible land use in any APZ due to the high concentration of people.

Residential land use is considered incompatible in APZ I. Therefore, the 44 acres of residential land use in the City of Sherwood as shown in **Table 4-4** are considered incompatible.

Western APZ II. Residential land use is considered incompatible in APZ II. Therefore, the 263 acres of residential land use along Orchid Drive, Jansen Drive, and Pine Valley Drive in Pulaski County and directly south of these roadways in the City of Sherwood are considered incompatible.

The remaining 201 acres within the western APZ II consists of open-space/low-density land use in Pulaski County and open-space/ low-density floodplain land use in the City of Sherwood. These uses are considered compatible without restriction.

4.5.3 Overall Land Use Compatibility within the Noise Zones and APZs

For a land use to be considered compatible, it must meet criteria for its category for both noise and accident potential. Therefore, land that is within the 2011 DNL noise zones and within the APZs was evaluated to determine the combined land use compatibility. For example, a public building (public/semi-public land use) would be considered a compatible use within the 65–69 dBA DNL noise zone. Within APZ I, public/semi-public land use is considered incompatible. Therefore, if a public building was within both the 65–69 dBA DNL noise zone and APZ I, it would be considered incompatible.

For a land use to be considered compatible, it must meet criteria for its category for both noise and accident potential.

There are no land uses within the Little Rock AFB 2011 AICUZ environs where the compatibility differs as a result of noise and accident potential. As previously discussed, the only land use that is considered incompatible within the 2011 DNL noise zones and APZs is residential. As shown in **Table 4-5**, a total of 201 acres of residential land is present in the areas where the 2011 DNL noise zones and APZs overlap. For example, the 28 acres of residential land that is within the 65–69 dBA DNL noise zone and eastern APZ I is considered incompatible with the noise and accident potential generated by aircraft at Little Rock AFB. This land is east of the runway centerline in Pulaski County. The 108 acres of residential land use east and west of Peters Road in Pulaski County is the largest area where residences are exposed to both high noise levels and accident potential. The eastern and western CZs are completely within the installation boundary, and are therefore not shown in **Table 4-5**. In several areas, the DNL noise zones and APZs do not overlap, such as the land west of the installation in western APZ II. It is recommended that the cities of Jacksonville and Sherwood act consistently with USAF land use compatibility guidelines when considering new development within the AICUZ environs.

Table 4-5. Residential Land Use within the 2011 DNL Noise Zones and APZs

DNL Noise Zone	Eastern APZs		Western APZs		Total
	APZ I	*APZ II*	*APZ I*	*APZ II*	
65–69 dBA	28	108	8	N/A	**144**
70–74 dBA	10	47	N/A	N/A	**57**
75–79 dBA	0	N/A	N/A	N/A	**0**
80+ dBA	0	N/A	N/A	N/A	**0**
Total	**38**	**155**	**8**	**N/A**	**201**

Note: N/A denotes that the DNL noise zones and APZs do not overlap.

The existing residential development within the AICUZ environs is considered incompatible with USAF guidelines; however it is important to note that there are areas where the 2011 DNL noise zones and APZs overlap in which new development could also be considered incompatible. For example, commercial development is present east of the installation in Pulaski County that is within the 65–69 dBA DNL noise zone and western APZ II. Commercial land use is considered compatible in the 65–69 dBA DNL noise zone; however, only low-density commercial land use is considered compatible within APZ II. The existing facilities are low-density, however any new high-density commercial development such as shopping malls or centers would be considered incompatible. It is recommended that local municipalities act consistently with USAF land use compatibility guidelines with respect to noise zones and APZs when considering development proposals.

4.6 Incompatible Zoning Uses

Zoning compatibility with Little Rock AFB activities should be taken into consideration when the cities of Cabot, Jacksonville, and Sherwood; and the counties of Lonoke, Pulaski, and White make planning decisions. Since the zoning designation should determine the future land use of a parcel, it is recommended that land in the vicinity of Little Rock AFB, All-American LZ, and Blackjack DZ be zoned in accordance with land use guidelines (as shown in **Table 3-2**) within the noise zones, CZs, and APZs. In general, the USAF's land use compatibility guidelines recommend that noise-sensitive land uses be placed outside high-noise zones, and people-intensive uses not be placed in APZs.

4.6.1 Noise Zones

As discussed in **Sections 4.3.5** through **4.3.7**, Lonoke, Pulaski, and White counties did not have zoning at the time this AICUZ Study was written. Therefore, the vast majority (approximately 92 percent) of the land outside of the installation boundary that is within the 2011 DNL noise zone is unzoned. This lack of zoning creates the potential to allow incompatible development adjacent to the installation and the Blackjack DZ, which could compromise the ability of Little Rock AFB to fulfill its mission requirements. It is recommended that Lonoke, Pulaski, and White counties act consistently with USAF-recommended land use compatibility guidelines in relation to noise zones and APZs (see **Table 3-2**) when developing their zoning ordinances and zoning maps.

Lonoke, Pulaski, and White counties did not have zoning at the time this AICUZ Study was written. Therefore, approximately 92 percent of the off-installation land within the 2011 DNL noise zones is unzoned.

65–69 dBA DNL Noise Zone. Approximately 91 percent of the land outside of the installation boundary that is within the 65–69 dBA DNL noise zone is unzoned. The remaining 9 percent is zoned land within the Cabot and Sherwood city limits.

Approximately 76 acres are within the Cabot city limits, and is predominately zoned for industrial use with small areas zoned for commercial use. However, the land use is currently open-space/low-density floodplain. The zoning designation should determine the future land use of a parcel. Industrial and commercial use is considered compatible within the 65–69 dBA DNL noise zone without restriction. It is recommended that the City of Cabot enforce their zoning designations for this area when considering new construction proposals, which would ensure that this area remains compatible with Little Rock AFB aircraft operations.

Approximately 94 acres are within the Sherwood city limits; these include light industrial and floodplain zoning. These areas are currently used for industrial purposes and open-space/low-density floodplains; therefore, the City of Sherwood has ensured that the land use matches the zoning designation in these areas. Industrial and floodplain use in the 65–69 dBA DNL noise zone are considered compatible without restriction. If additional development is proposed for this area, it is recommended that the City of Sherwood enforce the restrictions included in their AICUZ overlay district, i.e., "no use shall allow for exposure of any person(s) to a noise level greater than 65 dBA DNL" (City of Sherwood 2007).

70–80+ dBA DNL Noise Zones. All of the land outside of the installation boundary that is within the 70–80+ dBA DNL noise zones is unzoned.

4.6.2 Accident Potential Zones

In accordance with Arkansas Code 14-56-426, the cities of Jacksonville and Sherwood have each created an AICUZ overlay district in order to direct the development and future use of land within the CZs, APZs I, and APZs II (see **Sections 4.3.3** and **4.3.4**). However, the boundaries of their respective AICUZ overlay districts are not included in their electronic zoning data and are therefore not shown on **Figure 4-3**. It is recommended that the zoning maps and electronic zoning data for the cities of Jacksonville and Sherwood be updated to indicate the location of their respective AICUZ overlay districts.

Clear Zones. As previously discussed, the eastern and western CZs are within the installation boundary, and do not encompass any off-installation zoning.

The majority (approximately 75 percent) of the off-installation land within the Little Rock AFB APZs is unzoned. This lack of zoning creates the potential to allow incompatible development.

Eastern APZ I and APZ II. The vast majority of the land in the eastern APZ I and all of the land in the eastern APZ II are outside of the installation boundary in Pulaski County; this land is unzoned. Although there is no zoning, the majority of the land use within the eastern APZs is considered compatible; this includes open-space/low-density, commercial, and open-space/low-density floodplain land uses. However, residential land use, which is considered incompatible in any APZ, is also present. Since the land within the eastern APZs I and II is not zoned, there are no restrictions on additional development that could be incompatible with Little Rock AFB aircraft operations. It is recommended that Pulaski County act consistently with USAF-recommended land use compatibility guidelines in relation to APZs when zoning this area (see **Table 3-2**).

Western APZ I and APZ II. Approximately 17 percent of the land within western APZ I and approximately 65 percent of the land within western APZ II is unzoned in Pulaski County. The land that is zoned within western APZ I includes floodplain, light industrial, and single-family residence zoning in the City of Sherwood. This zoning is consistent with the land uses in this area. Floodplain and light industrial uses are considered compatible within APZ I; however, further deliberation by municipal planners could be needed as a result of variation in the densities of persons and structures. Residential land use is considered incompatible in any APZ. It is recommended that the City of Sherwood enforce the residential density restrictions included in their AICUZ overlay district (i.e., no more than one dwelling per acre) when considering new construction within the APZs.

The zoned land within western APZ II includes floodplain and single-family residence zones in the City of Sherwood. This is consistent with the land uses in this area. The same USAF guidelines discussed for western APZ I would apply to the land within western APZ II.

4.6.3 Overall Zoning Compatibility within the Noise Zones and APZs

Land that is zoned within the Little Rock AFB 2011 DNL noise zones and APZs was evaluated to determine the combined zoning compatibility. The methodology that was used to determine the combined land use compatibility, discussed in **Section 4.5.3**, was also used to determine the combined zoning compatibility.

Only a small portion of the land where the 2011 DNL noise zones and APZs overlap is zoned, this area is directly west of the installation in the City of Sherwood. The 65–69 dBA DNL noise zone and western APZ I encompass 29 acres of land zoned for floodplain and 65 acres of light industrial. The City of Sherwood has ensured that the land use matches the zoning designation in these areas. Floodplain and light industrial uses are considered compatible within the 65–69 dBA DNL noise zone and APZ I; however, further deliberation by municipal planners could be needed as a result of variation in the densities of persons and structures. If additional development is proposed in this area, it is recommended that the City of Sherwood enforce the noise and density restrictions included in their AICUZ overlay district.

4.7 Planning Considerations

AICUZ noise zones describe the noise characteristics of a specific operational environment and, as such, will change if a significant operational change is made. Should a new mission be established at Little Rock AFB, such as adding a larger number of aircraft or additional model types, the AICUZ could be amended.

With these thoughts in mind, this AICUZ Study is an update to the 2003 AICUZ Study and contains flight track, APZ, and noise zone information that reflects the most current and accurate picture of aircraft activities. Land use and zoning suggestions that could be implemented are as follows:

- The municipalities surrounding the installation should provide timely notification to Little Rock AFB regarding new development plans within the noise zones or APZs.
- Unzoned areas encompassed by the DNL noise zones and APZs at Little Rock AFB should be zoned to ensure compatible development.
- The AICUZ overlay district regulations implemented by the cities of Jacksonville and Sherwood should continue to be applied and enforced in order to regulate potential development within the APZs.
- The official zoning maps and electronic land use and zoning data for the cities of Jacksonville and Sherwood should be updated to indicate the location of their respective AICUZ overlay districts.
- Local municipalities should provide for Real Estate disclosures in noise zones and APZs around Little Rock AFB.
- Local municipalities should exercise caution when approving transportation plans, such as the proposed collector roads south of the western APZs in the City of Sherwood (see **Section 4.4**), to ensure that such plans would not attract development that could impact Little Rock AFB's ability to fulfill its mission requirements.
- Pulaski and Lonoke counties should encourage developers to seek annexation from municipalities rather than developing in underserved unincorporated areas. The counties should also continue to make municipalities and other public service providers active participants in the development review and approval process.
- Several currently vacant areas in close proximity to Little Rock AFB are identified as available for residential development by the cities of Jacksonville and Sherwood. If developed as residential properties at high densities, these areas could be incompatible with future Little Rock AFB aircraft operations. It is recommended that the cities act consistently with USAF land use compatibility guidelines in relation to the noise zones and APZs when developing these areas.

5. IMPLEMENTATION

5.1 Introduction

Implementation of the AICUZ Study must be a joint effort between the USAF and adjacent communities. The USAF's role is to minimize the noise impact of Little Rock AFB operations on local communities. The role of the communities is to ensure that development in the surrounding areas is compatible with the accepted planning and development principles and practices.

5.2 USAF Responsibilities

In general, the USAF perceives its AICUZ-related responsibilities as encompassing the areas of flying safety, noise abatement, and participation in the land use planning process.

Well-maintained aircraft and well-trained aircrews do a great deal to avoid aircraft accidents. Despite the best aircrew training and aircraft maintenance intentions, however, history clearly shows that accidents do occur. It is imperative that flights be routed more over sparsely populated areas as regularly as possible to reduce the exposure of lives and property to a potential accident.

An overview of the USAF aircraft accident hazard study that resulted in the creation of runway CZs and APZs is provided in Appendix B.

Commanders are required by USAF policy to periodically review air traffic patterns, instrument approaches, minimum weather conditions under which aircraft can use the airfield (e.g., visibility, ceiling), and operating practices, and evaluate these factors in relationship to populated areas and other local situations. This requirement is a direct result and expression of USAF policy that all AICUZ plans must include an analysis of flying and flying-related activities designed to reduce and control the effects of such operations on surrounding land areas. Noise is generated from aircraft both in the air and on the ground. In an effort to reduce the noise effects of Little Rock AFB operations on surrounding communities, the installation routes flight tracks to avoid populated areas.

Preparation and presentation of this Little Rock AFB AICUZ Study is one phase of continuing USAF participation in the local planning process. It is recognized that as the local community updates its land use plans, the USAF must be ready to provide additional input when needed.

It is also recognized that the AICUZ Program is an ongoing activity even after compatible development plans are adopted and implemented. Little Rock AFB personnel are prepared to participate in the continuing discussion of zoning and other land use matters as they might affect, or might be affected by, the installation. Little Rock AFB personnel are also available to provide information, criteria, and guidelines to state, regional, and local planning bodies, civic associations, and similar groups.

5.3 Local Community Responsibilities

The residents of the cities of Cabot, Jacksonville, and Sherwood; and Pulaski Lonoke, and White counties have a long history of working together with personnel from Little Rock AFB. Adoption of the following recommendations during the revision of relevant land use planning or zoning regulations will strengthen this relationship, increase the health and safety of the public, and help protect the integrity of the installation's flying mission.

- Community planners and plan reviewers from Pulaski, Lonoke, and White counties should consider the recommendations of this AICUZ Study when they are developing their land use plans and zoning regulations. It is recommended that the 2011 DNL noise zones and APZs overlay maps provided in this AICUZ Study (see **Figures 3-2** and **3-4**) be incorporated into these regulations by reference.
- Community planners and plan reviewers from the City of Sherwood should consider the recommendations of this AICUZ Study when developing their land use plan. It is recommended that the 2011 DNL noise zones and APZs overlay maps provided in this AICUZ Study (see **Figures 3-2** and **3-4**) be incorporated into their land use plan by reference.
- Local governments should formalize procedures regarding the avoidance of planning and zoning activities that have the potential to be incompatible with aircraft operations at Little Rock AFB. These procedures could include the creation of a working group representing city planners, county commissioners, and Little Rock AFB planners to meet at least quarterly to discuss AICUZ concerns and major development proposals that could affect Little Rock AFB operations. Alternatively, a representative from Little Rock AFB could be established as an exofficio on city or county planning commissions.
- Arkansas Code 14-56-426 should be expanded to include any city or county affected by noise greater than 65 dBA DNL or accident potential from a USAF installation. This would extend the land use restrictions provided by the Jacksonville and Sherwood AICUZ overlay districts to all the areas affected by Little Rock AFB aircraft operations (the City of Cabot and Lonoke and Pulaski counties), thereby maintaining the installation's ability to fulfill its mission requirements.
- Ensure that any future adopted versions of local future development plans incorporate AICUZ policies and USAF land use compatibility guidelines and are conducted in accordance with Arkansas Code 14-56-426. The overlay maps of the noise zones and the compatibility guidelines presented in this AICUZ Study should be used to evaluate existing and future land use proposals.
- Enact fair disclosure ordinances to specify disclosure to the public those AICUZ items directly related to aircraft operations at Little Rock AFB.

- The Jacksonville AICUZ overlay district should be revised to prohibit uses that expose persons to noise levels at or greater than 65 dBA DNL, as opposed to 75 dBA DNL as the ordinance is currently written, in accordance with the updated version of Arkansas Code 14-56-426.
- Subdivision regulations should provide for the rejection of proposed new subdivisions not compatible with AICUZ land use guidelines and provide controls for continued development in existing subdivisions.
- Carefully review capital improvement programs to discourage incompatible land use patterns, with particular emphasis on utility extension planning.

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APPENDIX A

AICUZ CONCEPT, PROGRAM, METHODOLOGY, AND POLICIES

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Appendix A

AICUZ Concept, Program, Methodology, and Policies

A.1 Concept

Federal legislation, national sentiment, and other external forces which directly affect the USAF mission have served to greatly increase the USAF's role in environmental and planning issues. Problems of airfield encroachment from incompatible land uses around installations, as well as air and water pollution and socioeconomic impacts, require continued and intensified USAF involvement. The nature of these problems dictates direct USAF participation in comprehensive community and land use planning. Effective, coordinated planning that bridges the gap between the Federal government and the community requires the establishment of good working relationships with local citizens, local planning officials, and state and Federal officials. This planning depends on creating an atmosphere of mutual trust and helpfulness. The Air Installation Compatible Use Zone (AICUZ) concept has been developed in an effort to

- Protect local citizens from the noise exposure and accident potential associated with flying activities
- Prevent degradation of the USAF's capability to achieve its mission by promoting compatible land use planning.

The land use guidelines developed herein are a composite of a number of other land use compatibility studies that have been refined to fit the Little Rock Air Force Base (AFB) aviation environment.

A.2 Program

Base Commanders establish and maintain active programs to achieve the maximum feasible land use compatibility between air installations and neighboring communities. The program requires that all appropriate governmental bodies and citizens be fully informed whenever AICUZ or other planning matters affecting the installation are under consideration. This includes positive and continuous programs designed to

- Provide information, criteria, and guidelines to Federal, state, regional, and local planning bodies, civic associations, and similar groups.
- Inform such groups of the requirements of the flying activity, noise exposure, aircraft accident potential, and AICUZ plans.
- Describe the noise reduction measures that are being used.
- Ensure that all reasonable, economical, and practical measures are taken to reduce or control the impact of noise-producing activities. These measures include proper location of engine test facilities, provision for sound suppressers where necessary, adjustment of flight tracks, and techniques to minimize the noise impact on populated areas. This must be done without jeopardizing safety or operational effectiveness.

A.3 Methodology

The AICUZ consists of land areas upon which certain land uses might obstruct the airspace or otherwise be hazardous to aircraft operations; and land areas which are exposed to the health, safety, or welfare hazards of aircraft operations. The AICUZ includes

- APZs and CZs based on past USAF aircraft accidents and installation operational data (see **Appendix B**)
- Noise zones produced by the computerized DNL metric (see **Appendix C**)
- The area designated by the Federal Aviation Administration and the USAF for purposes of height limitations in the approach and departure zones of the base (see **Appendix D**).

The APZs, CZs, and DNL noise zones are the basic building blocks for land use planning with AICUZ data. Compatible land uses are specified for these zones, and recommendations on building materials and standards to reduce interior noise levels inside structures are provided in **Appendix E**.

As part of the AICUZ Program, the only real property acquisition for which the USAF has received congressional authorization and the base and Major Commands request appropriation are the areas designated as the CZ. Real property interests are acquired by fee or easement giving the base control over the use of the property. Fee land so acquired may be leased out for agricultural or grazing purposes. Compatible land use controls for the remaining airfield environs should be accomplished through the community land use planning processes.

A.4 AICUZ Land Use Development Policies

The basis for any effective land use control system is the development of, and subsequent adherence to, policies which serve as the standard by which all land use planning and control actions are evaluated. Little Rock AFB recommends the following policies be considered for incorporation into the comprehensive plans of agencies in the vicinity of the base environs:

Policy 1. To promote the public health, safety, peace, comfort, convenience, and general welfare of the inhabitants of airfield environs, it is necessary to

- Guide, control, and regulate future growth and development
- Promote orderly and appropriate use of land
- Protect the character and stability of existing land uses
- Prevent the destruction or impairment of the airfield and the public investment therein
- Enhance the quality of living in the areas affected
- Protect the general economic welfare by restricting incompatible land use.

Policy 2. In furtherance of Policy 1, it is appropriate to

- Establish guidelines of land use compatibility
- Restrict or prohibit incompatible land use
- Prevent establishment of any land use which would unreasonably endanger aircraft operations and the continued use of the airfield

- Incorporate the AICUZ concept into community land use plans, modifying them when necessary
- Adopt appropriate ordinances to implement airfield environs land use plans.

Policy 3. Within the boundaries of the CZ, certain land uses are inherently incompatible. The following land uses are not in the public interest and must be restricted or prohibited:

- Uses that release into the air any substance, such as steam, dust, or smoke, which would impair visibility or otherwise interfere with the operation of aircraft
- Uses that produce light emissions, either direct or indirect (reflective), which would interfere with pilot vision
- Uses that produce electrical emissions which would interfere with aircraft communication systems or navigation equipment
- Uses that attract birds or waterfowl, such as operation of sanitary landfills, maintenance or feeding stations, or growth of certain vegetation
- Uses that provide for structures within 10 feet of aircraft approach-departure or transitional surfaces.

Policy 4. Certain noise levels of varying duration and frequency create hazards to both physical and mental health. A limited, though definite, danger to life exists in certain areas adjacent to airfields. Where these conditions are sufficiently severe, it is not consistent with public health, safety, and welfare to allow the following land uses:

- Residential
- Retail business
- Office buildings
- Public buildings (schools, churches, etc.)
- Recreation buildings and structures.

Policy 5. Land areas below takeoff and final approach flight paths are exposed to significant danger of aircraft accidents. The density of development and intensity of use must be limited in such areas.

Policy 6. Different land uses have different sensitivities to noise. Standards of land use acceptability should be adopted, based on these noise sensitivities. In addition, a system of Noise Level Reduction guidelines (see **Appendix E**) for new construction should be implemented to permit certain uses where they would otherwise be prohibited.

Policy 7. Land use planning and zoning in the airfield environs cannot be based solely on aircraft-generated effects. Allocation of land used within the AICUZ should be further refined by consideration of:

- Physiographic factors
- Climate and hydrology
- Vegetation
- Surface geology

- Soil characteristics
- Intrinsic land use potential and constraints
- Existing land use
- Land ownership patterns and values
- Economic and social demands
- Cost and availability of public utilities, transportation, and community facilities
- Other noise sources.

Each runway end at Little Rock AFB has a 3,000 foot by 3,000 foot CZ and two APZs (see **Appendix B**). Accident potential on or adjacent to the runway or within the CZ is so high that the necessary land use restrictions would prohibit reasonable economic use of land. As stated previously, it is USAF policy to request the U.S. Congress to authorize and appropriate funds for the necessary real property interests in this area to prevent incompatible land uses.

APZ I is less critical than the CZ, but still possesses a significant risk factor. This 3,000-foot by 5,000-foot area has land use compatibility guidelines which are sufficiently flexible to allow reasonable economic use of the land, such as industrial/manufacturing, transportation, communication/utilities, wholesale trade, open space, recreation, and agriculture. However, uses that concentrate people in small areas are not acceptable.

APZ II is less critical than APZ I, but still has potential for accidents. APZ II is 3,000 feet wide by 7,000 feet long extending to 15,000 feet from the runway threshold. Acceptable uses include those of APZ I, as well as low-density single family residential, and those personal and business services and commercial/retail trade uses of low-intensity or scale of operation. High-density functions such as multistory buildings, places of assembly (e.g., theaters, churches, schools, restaurants), and high-density office uses are not considered appropriate.

High people densities should be limited to the maximum extent possible. The optimum density recommended for residential usage (where it does not conflict with noise criteria) in APZ II is one dwelling per acre. For most nonresidential usage, buildings should be limited to one story and the lot coverage should not exceed 20 percent.

A.5 Basic Land Use Compatibility

Research on aircraft accident potential, noise, and land use compatibility is ongoing at a number of Federal and other agencies. These studies and all other compatibility guidelines must not be considered inflexible standards. They are the framework within which land use compatibility questions can be addressed and resolved. In each case, full consideration must be given to local conditions such as the following:

- Previous community experience with aircraft accidents and noise
- Local building construction and development practices
- Existing noise environment due to other urban or transportation noise sources
- Time period of aircraft operations and land use activities

- Specific site analysis
- Noise buffers, including topography.

These basic guidelines cannot resolve all land use compatibility questions, but they do offer a reasonable framework within which to work.

A.6 Accident Potential

Land use guidelines for the two APZs are based on a hazard index system which compares the relationship of accident occurrence for five areas:

- On or adjacent to the runway
- Within the CZ
- In APZ I
- In APZ II
- In all other areas within a 10 nautical mile radius of the runway.

Accident potential on or adjacent to the runway or within the CZ is so high that few uses are acceptable. The risk outside APZ I and APZ II, but within the 10 nautical mile radius area, is significant, but is acceptable if sound engineering and planning practices are followed.

Land use guidelines for APZs I and II have been developed. The main objective has been to restrict all people-intensive uses because there is greater risk in these areas. The basic guidelines aim at prevention of uses that

- Have high residential density characteristics
- Have high labor intensity
- Involve aboveground explosive, fire, toxic, corrosive, or other hazardous characteristics
- Promote population concentrations
- Involve utilities and services required for area wide population, such as telephone and gas, where disruption would have an adverse impact
- Concentrate people who are unable to respond to emergency situations, such as children, the elderly, and the handicapped
- Pose hazards to aircraft operations.

There is no question that these guidelines are relative. Ideally, there should be no people-intensive uses in either of these APZs. The free market and private property systems prevent this where there is land development demand. To go beyond these guidelines, however, substantially increases risk by placing more people in areas where there could ultimately be an aircraft accident.

A.7 Noise

Nearly all studies analyzing aircraft noise and residential compatibility recommend no residential uses in land areas associated with a DNL above 75 A-weighted decibels (dBA). Usually, no restrictions are recommended below 65 dBA DNL. Between 65–74 dBA DNL, there is currently no consensus or

restrictions. These areas might not qualify for Federal mortgage insurance in residential categories according to U.S. Department of Housing and Urban Development (HUD) Regulation 24 Code of Federal Regulations (CFR) Section 51B. In many cases, HUD approval requires noise-attenuation measures, the Regional Administrator's concurrence, and an Environmental Impact Statement. The Department of Veterans Affairs also has airfield noise and accident restrictions, which apply to their home loan guarantee program. USAF land use compatibility guidelines also state that, whenever possible, residential land use should be located on land with a noise level below 65 dBA DNL.

Most *industrial/manufacturing* uses are compatible in the airfield environs. Exceptions are uses such as research or scientific activities, which require lower noise levels. Noise-attenuation measures are recommended for portions of buildings devoted to office use, receiving the public, or where there is a requirement for low background noise levels.

Transportation, communications, and utility categories have higher noise level compatibility because they generally are not people-intensive. When people use land for these purposes, the use is generally very short in duration; however, when buildings are required for these uses, additional evaluation is warranted.

The *commercial/retail trade and personal and business services* categories are compatible without restriction up to 70 dBA DNL; however, they are generally incompatible above 80 dBA DNL. Between 70–80 dBA DNL, noise level reduction measures should be included in the design and construction of buildings.

The nature of most uses in the *public and quasi-public services* category requires a quieter environment, and attempts should be made to locate these uses in land areas below 65 dBA DNL (i.e., a USAF land use recommendation), or else provide adequate noise level reduction.

Although *recreational* use has often been recommended as compatible with high noise levels, recent research has resulted in a more conservative view. Above 75 dBA DNL, noise becomes a factor, which limits the ability to enjoy such uses. Where the requirement to hear is a function of the use (e.g., music shell), compatibility is limited. Buildings associated with golf courses and similar uses should be noise attenuated.

Forestry activities; livestock farming; and uses in the resources production, extraction, and open space categories are compatible almost without restrictions within all DNL noise zones.

APPENDIX B

CLEAR ZONES AND ACCIDENT POTENTIAL ZONES

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Appendix B

Clear Zones and Accident Potential Zones

B.1 Guidelines for Accident Potential

Urban areas around airports are exposed to the possibility of aircraft accidents even with well-maintained aircraft and highly trained aircraft crews. Despite stringent maintenance requirements and countless hours of training, past history makes it clear that accidents are going to occur.

When the AICUZ Program began, there were no current comprehensive studies on accident potential. In support of the program, the USAF completed a study of USAF accidents that occurred between 1968 and 1972 within 10 nautical miles of airfields. The study of 369 accidents revealed that 75 percent of aircraft accidents occurred on or adjacent to the runway (1,000 feet to each side of the runway centerline) and in a corridor 3,000 feet wide (1,500 feet on either side of the runway centerline), extending from the runway threshold along the extended runway centerline for a distance of 15,000 feet.

Three zones were established based on crash patterns: the CZ, APZ I, and APZ II. The CZ starts at the end of the runway and extends outward 3,000 feet. It has the highest accident potential of the three zones. The USAF has adopted a policy of acquiring property rights to areas designated as CZs because of the high accident potential. APZ I extends from the CZ an additional 5,000 feet. It includes an area of reduced accident potential. APZ II extends from APZ I an additional 7,000 feet in an area of further reduced accident potential.

The USAF research work in accident potential was the first significant effort in this subject area since 1952 when the President's Airport Commission published The Airport and Its Neighbors, better known as the "Doolittle Report." The recommendations of this earlier report were influential in the formulation of the APZ concept.

The risk to people on the ground of being killed or injured by aircraft accidents is small. However, an aircraft accident is a high consequence event, and when a crash does occur the result is often catastrophic. Because of this, the USAF does not attempt to base its safety standards on accident probabilities. Instead the USAF approaches this safety issue from a land use planning perspective.

B.2 Accident Potential Analysis

Military aircraft accidents differ from commercial air carrier and general aviation accidents because of the variety of aircraft used, the type of missions, and the number of training flights. In 1973, the USAF performed an aircraft accident hazard study to identify land near airfields with significant accident potential. Accidents studied occurred within 10 nautical miles of airfields.

The study reviewed 369 major USAF accidents during the period of 1968 to 1972, and found that 61 percent of the accidents related to landing operations and 39 percent related to takeoffs. It also found that 70 percent occurred in daylight, and that fighter and training aircraft accounted for 80 percent of the accidents.

Because the purpose of the study was to identify accident hazards, the study plotted each of the 369 accidents in relation to the airfield. This plotting found that the accidents clustered along the runway and its extended centerline. To further refine this clustering, a tabulation was prepared which described

the cumulative frequency of accidents as a function of distance from the runway centerline along the extended centerline. This analysis was done for widths of 2,000, 3,000, and 4,000 feet. **Table B-1** shows the results of the location analysis.

Table B-1. Location Analysis

Length From Both Ends of Runway (feet)	Width of Runway Extension (feet)		
	2,000	3,000	4,000
Percent of Accidents			
On or adjacent to runway (1,000 feet to each side of runway centerline)	23	23	23
0 to 3,000	35	39	39
3,000 to 8,000	8	8	8
8,000 to 15,000	5	5	7
Cumulative Percent of Accidents			
On or adjacent to runway (1,000 feet to each side of runway centerline)	23	23	23
0 to 3,000	58	62	62
3,000 to 8,000	66	70	70
8,000 to 15,000	71	75	77

Figure B-1 indicates that the cumulative number of accidents rises rapidly from the end of the runway to 3,000 feet, rises more gradually to 8,000 feet, and then continues at about the same rate of increase to 15,000 feet, where it levels off rapidly. The location analysis also indicates that the optimum width of the safety zones, designed to include the maximum percentage of accidents in the smallest area, is 3,000 feet (see **Figures B-2** and **B-3**).

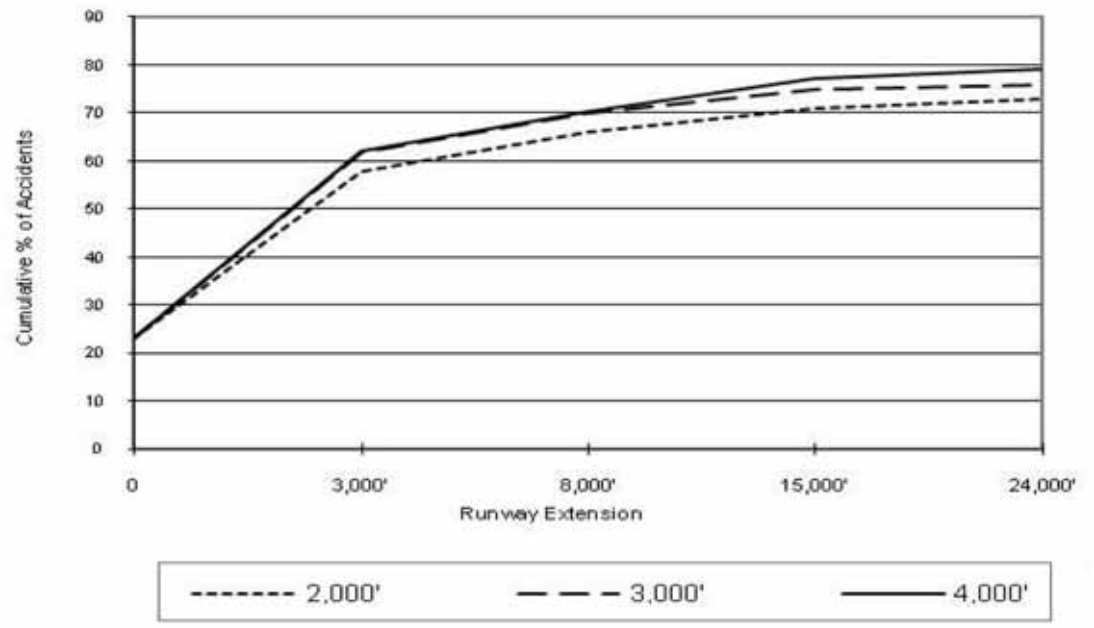

Figure B-1. Distribution of USAF Aircraft Accidents

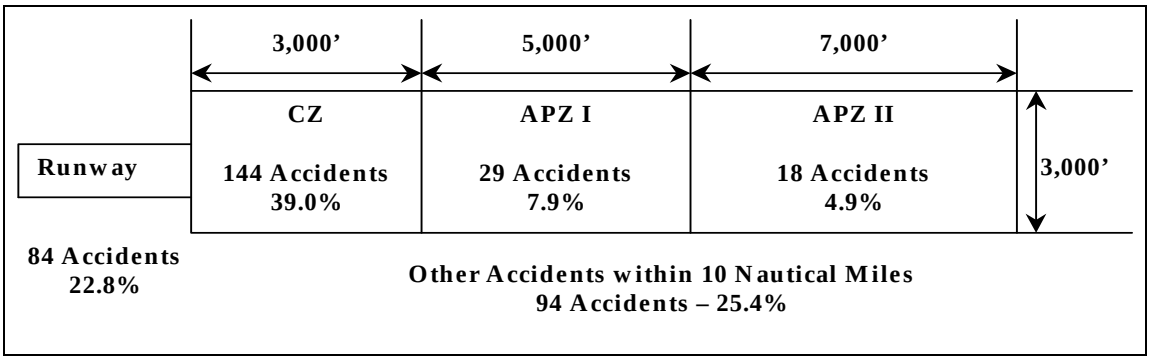

Figure B-2. USAF Accident Data (369 Accidents — 1968 to 1972)

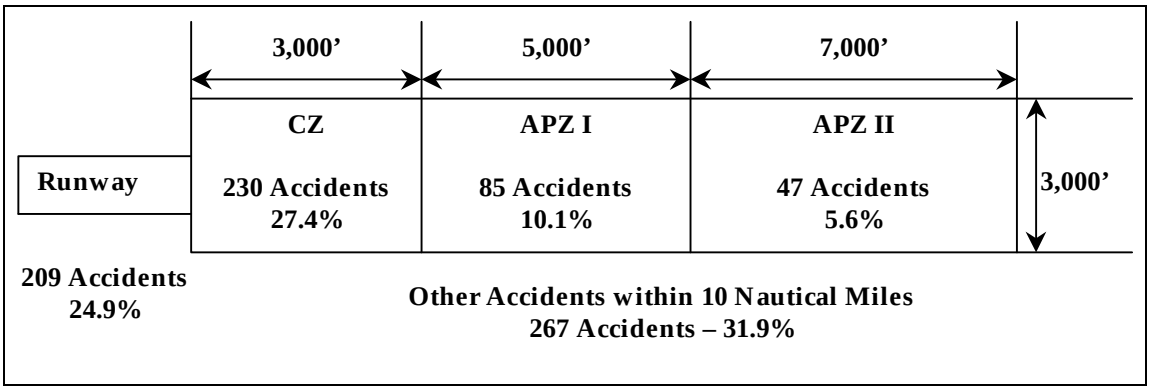

Figure B-3. USAF Accident Data (838 Accidents — 1968 to 1995)

The original study was updated to include accidents through September 1995. The updated study now includes 838 accidents during the 1968 to 1995 period. Using the optimum runway extension width of 3,000 feet, the accident statistics of the updated study are shown in **Figure B-3**.

Using the designated zones and accident data, it is possible to calculate a ratio of percentage of accidents to percentage of area size. These ratios indicate that the CZ, with the smallest area size and the highest number of accidents, has the highest ratio, followed by the runway and adjacent area, APZ I, and APZ II (see **Table B-2**).

B.3 Definable Debris Impact Areas

The USAF also determined which accidents had definable debris impact areas, and in what phase of flight the accident occurred. Overall, 75 percent of the accidents had definable debris impact areas, although they varied in size by type of accident. The USAF used weighted averages of impact areas, for accidents occurring only in the approach and departure phase, to determine the following average impact areas:

The USAF study used weighted averages of impact areas, for accidents occurring only in the approach and departure phase, to determine the following average impact areas:

- Overall Average Impact Area
- Fighter, Trainer, and Miscellaneous Aircraft
- Heavy Bomber and Tanker Aircraft.

Table B-2. Accident to Area Ratio

Ratio of Percentage of Accidents to Percentage of Area (USAF Accident Data 1968 – 1995)						
	Area (acres)[1]	**Number of Accidents[2]**	**Accidents per Acre**	**% Total Area**	**% Total Accidents**	**Ratio: Accidents to Area[3]**
Runway Area[4]	487	209	1 per 2.3	0.183	24.9	136.0
CZ	413	230	1 per 1.8	0.155	27.4	177.0
APZ I	689	85	1 per 8.1	0.258	10.1	39.0
APZ II	964	47	1 per 20.5	0.362	5.6	16.0
Other	264,053	267	1 per 989.0	99.042	31.9	0.3

Notes:

1. Area includes land within 10 nautical miles of runway (266,606 acres).
2. Total number of accidents is 838 (through 1995).
3. Percent total accidents divided by percent total area.
4. Runway Area dimensions are 2,000' x 10,600'.

B.4 Findings

Designation of safety zones around the airfield and restriction of incompatible land uses can reduce the public's exposure to safety hazards.

USAF accident studies have found that aircraft accidents near USAF installations occurred in the following patterns:

- 61 percent were related to landing operations
- 39 percent were related to takeoff operations
- 70 percent occurred in daylight
- 80 percent were related to fighter and training aircraft operations
- 25 percent occurred on the runway or within an area extending 1,000 feet out from each side of the runway
- 27 percent occurred in an area extending from the end of the runway to 3,000 feet along the extended centerline and 3,000 feet wide, centered on the extended centerline
- 15 percent occurred in an area between 3,000 and 15,000 feet along the extended runway centerline and 3,000 feet wide, centered on the extended centerline.

USAF aircraft accident statistics found that 75 percent of aircraft accidents resulted in definable impact areas. The size of the impact areas were as follows:

- 5.1 acres overall average
- 2.7 acres for fighters and trainers
- 8.7 acres for heavy bombers and tankers.

APPENDIX C

DESCRIPTION OF THE NOISE ENVIRONMENT

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Appendix C

Description of the Noise Environment

C.1 Noise Environment Descriptor

The noise zone methodology used herein is the DNL metric of describing the noise environment. Efforts to provide a national uniform standard for noise assessment have resulted in adoption by the U.S. Environmental Protection Agency of DNL as the standard noise descriptor. The USAF uses the DNL descriptor in assessing the amount of aircraft noise exposure, and as a metric for community response to the various levels of exposure. The DNL values used for planning purposes are 65, 70, 75, and 80 decibels (dB). Land use guidelines are based on the compatibility of various land uses with these noise exposure levels.

It is generally recognized that a noise environment descriptor should consider, in addition to the annoyance of a single event, the effect of repetition of such events and the time of day in which these events occur. DNL begins with a single event descriptor and adds corrections for the number of events and the time of day. Since the primary development concern is residential, nighttime events are considered more annoying than daytime events and are weighted accordingly. DNL values are computed from the single event noise descriptor, plus corrections for number of flights and time of day (see **Figure C-1**).

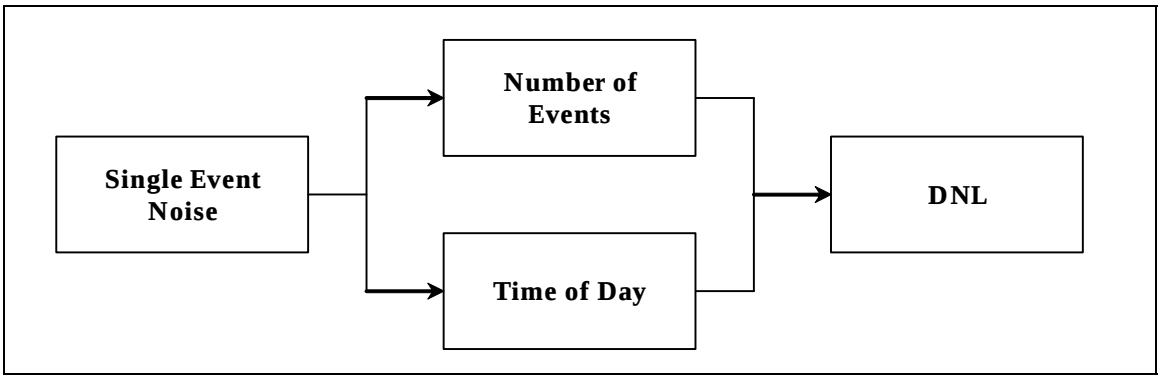

Figure C-1. Day-Night Average A-Weighted Sound Level

As part of the extensive data collection process, detailed information is gathered on the type of aircraft, and the number and time of day of flying operations for each flight track during a typical day. This information is used in conjunction with the single event noise descriptor to produce DNL values. These values are combined on an energy summation basis to provide single DNL values for the mix of aircraft operations at the base. Equal value points are connected to form the contour lines.

C.2 Noise Event Descriptor

The single event noise descriptor used in the DNL system is the Sound Exposure Level (SEL). The SEL measure is an integration of an A-weighted noise level over the period of a single event such, as an aircraft flyover, in dB.

Frequency, magnitude, and duration vary according to aircraft type, engine type, and power setting. Therefore, individual aircraft noise data are collected for various types of aircraft and engines at different

power settings and phases of flight. **Figure C-2** shows the relationship of the single event noise descriptor (SEL) to the source sound energy.

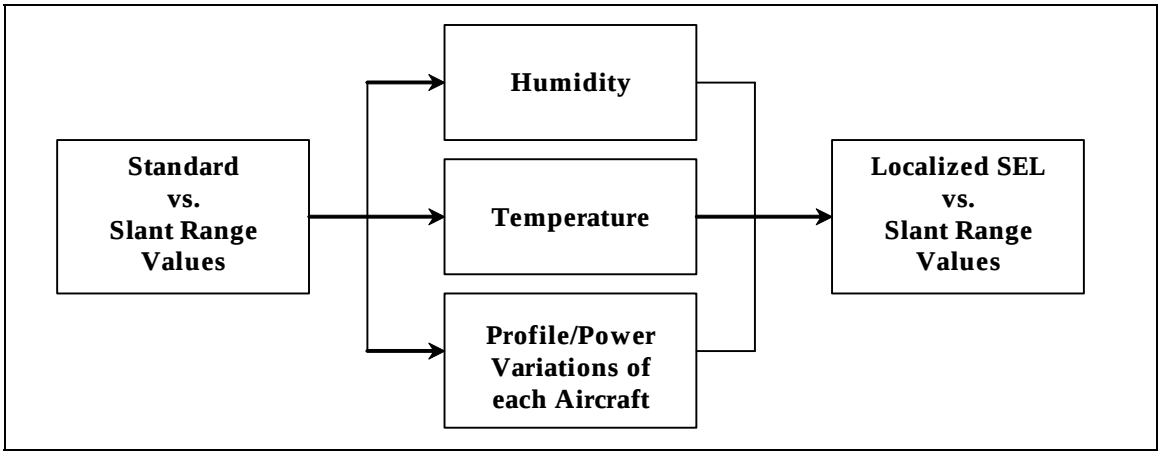

Figure C-2. Sound Exposure Level

SEL versus slant range values are derived from noise measurements made according to a source noise data acquisition plan developed by Bolt, Beranek, and Newman, Inc., in conjunction with and carried out by the USAF's Armstrong Laboratory. These standard day, sea level values form the basis for the individual event noise descriptors at any location and are adjusted to the location by applying appropriate corrections for temperature, humidity, and variations from standard profiles and power settings.

Ground-to-ground sound propagation characteristics are used for altitudes up to 500 feet absolute with linear transition between 500 and 700 feet and air-to-ground propagation characteristics above 700 feet.

In addition to the assessment of aircraft flight operations, the DNL system also incorporates noise resulting from engine and aircraft maintenance checks on the ground. Data concerning the orientation of the noise source, type of aircraft or engine, number of test runs on a typical day, power settings used and their duration, and use of suppression devices are collected for each ground runup or test position. This information is processed and the noise contribution added (on an energy summation basis) to the noise generated by flying operations to produce DNL noise zones reflecting the overall noise environment with respect to aircraft air and ground operations.

C.4 Noise Zone Production

Data describing flight track distances and turns, altitudes, airspeeds, power settings, flight track operational utilization, maintenance locations, ground run-up engine power settings, and number and duration of runs by type of aircraft and engine were assembled for Little Rock AFB. The data were screened by the Major Command (MAJCOM) and the Air Force Center for Engineering and the Environment. Flight track maps were generated and approved by the installation and MAJCOM. After any required changes were incorporated, DNL contours were generated by the NOISEMAP software program using the supplied data and standard source noise data corrected to local weather conditions. These contours were plotted and provided in the body of this report.

C.5 Technical Information

Additional technical information on the DNL procedures is available in the following publications:

- *Community Noise Exposure Resulting from Aircraft Operations: Applications Guide for Predictive Procedure.* AMRL-TR-73-105, November 1974, from National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22151.
- *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with Adequate Margin of Safety*, USEPA Report 550/9-74-004, March, 1974, from Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.
- *Adopted Noise Regulations for California Airports*, Title 4, Register 70, No. 48-11-28-70, Subchapter 6, Noise Standards.

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APPENDIX D

HEIGHT OBSTRUCTION CRITERIA

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Appendix D

Height Obstruction Criteria

General. This appendix establishes criteria for determining whether an object or structure is an obstruction to air navigation. Obstructions to air navigation are as follows:

- Natural objects or man-made structures that protrude above the planes or surfaces as defined in the following paragraphs.
- Man-made objects that extend more than 500 feet above the ground at the site of the structure.

Explanation of Terms. The following will apply (see **Figure D-1**):

- *Controlling Elevation.* Whenever surfaces or planes within the obstructions criteria overlap, the controlling (or governing) elevation becomes that of the lowest surface or plane.
- *Runway Length.* Little Rock AFB has one runway that is 12,000 feet long by 200 feet wide that is designed and built for sustained aircraft landings and takeoffs.
- *Established Airfield Elevation.* The elevation, in feet above mean sea level, for Little AFB is approximately 311 feet.
- *Dimensions.* All dimensions are measured horizontally unless otherwise noted.

For a more complete description of airspace and control surfaces for Class A and Class B runways, see Federal Aviation Regulation Part 77, Subpart C, or Unified Facilities Criteria (UFC) 3-260-01.

Planes and Surfaces. Definitions for military surfaces are as follows:

Primary Surface

- This surface defines the limits of the obstruction clearance requirements in the immediate vicinity of the landing area.
- The primary surface comprises surfaces of the runway, runway shoulders, and lateral safety zones and extends 200 feet beyond the runway end.
- The width of the primary surface for a single class "B" runway is 2,000 feet, or 1,000 feet on each side of the runway centerline.

Clear Zone Surface

- This surface defines the limits of the obstruction clearance requirements in the vicinity contiguous to the end of the primary surface.
- The clear zone surface is located on the ground or water at each end of the primary surface, with a length of 1,000 feet and the same width as the primary surface. (This definition is for Federal Aviation Administration defined surfaces and should not be confused with the Clear Zone defined in **Section 3.3**, which is used to describe accident potential.)

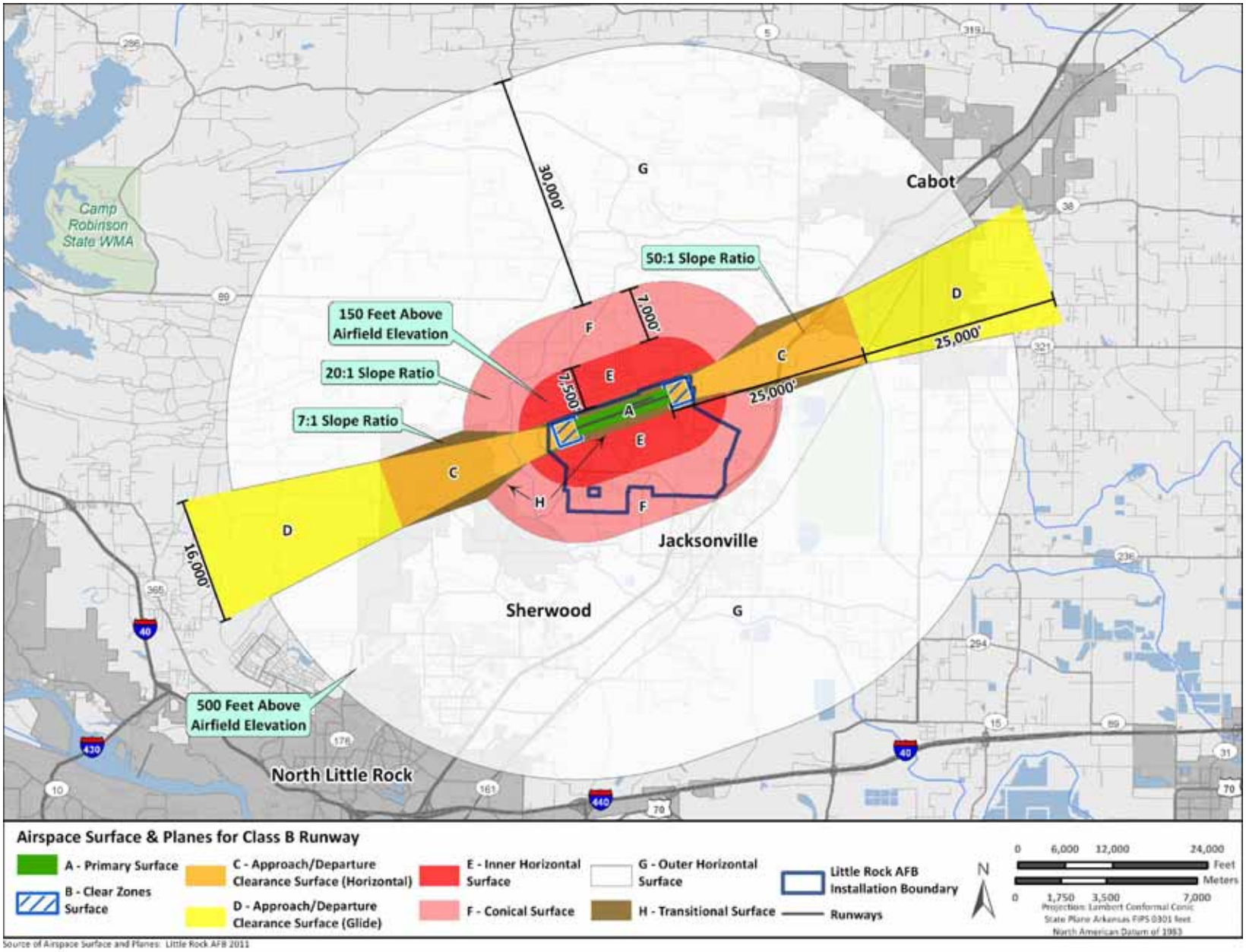

Figure D -1. Airspace Control Surface Plan for Little Rock AFB

Approach-Departure Clearance Surface

- This surface is symmetrical around the runway centerline extended, begins as an inclined plane (glide angle) 200 feet beyond each end of the primary surface of the centerline elevation of the runway end, and extends for 50,000 feet.
- The slope of the approach-departure clearance surface is 50:1 along the extended runway (glide angle) centerline until it reaches an elevation of 500 feet above the established airfield elevation.
- It then continues horizontally at this elevation to a point 50,000 feet from the start of the glide angle.
- The width of this surface at the runway end is 2,000 feet; it flares uniformly, and the width at 50,000 feet is 16,000 feet.

Inner Horizontal Surface

- This surface is a plane, oval in shape at a height of 150 feet above the established airfield elevation.
- It is constructed by scribing an arc with a radius of 7,500 feet above the centerline at the end of the runway and interconnecting these arcs with tangents.

Conical Surface

- This is an inclined surface extending outward and upward from the outer periphery of the inner horizontal surface for a horizontal distance of 7,000 feet to a height of 500 feet above the established airfield elevation.
- The slope of the conical surface is 20:1.

Outer Horizontal Surface

- This surface is a plane 500 feet above the established airfield elevation.
- It extends for a horizontal distance of 30,000 feet from the outer periphery of the conical surface.

Transitional Surfaces

- These surfaces connect the primary surfaces, CZ surfaces, and approach-departure clearance surfaces to the outer horizontal surface, conical surface, other horizontal surface, or other transitional surfaces.
- The slope of the transitional surface is 7:1 outward and upward at right angles starting at 1,000 feet out from the runway centerline.
- To determine the elevation for the beginning of the transitional surface slope at any point along the lateral boundary of the primary surface, including the CZ, draw a line from this point to the runway centerline.
- This line will be at right angles to the runway axis.
- The elevation at the runway centerline is the elevation for the beginning of the 7:1 slope.

D.2 Height Restrictions

City/county agencies involved with approvals of permits for construction should require developers to submit calculations which show that projects meet the height restriction criteria of Federal Aviation Administration Part 77 as described, in part, by the information contained in this appendix.

APPENDIX E

NOISE LEVEL REDUCTION GUIDELINES

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Appendix E

Noise Level Reduction Guidelines

An update to Wyle Research Report 89-7, *Guidelines for Sound Insulation of Residences Exposed to Aircraft Operations* referenced in Arkansas Code 14-56-426 (Act 540 of 2005) was completed in April 2005. This updated report was sponsored by the Department of the Navy, Naval Facilities Engineering Command and was created by Wyle Laboratories; it provides in-depth, state-of-the-art noise level reduction guidelines. The study is available online from Wyle Laboratories at http://www.wylelabs.com/content/global/documents/WSI.pdf.

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