



## JOINT LAND USE STUDY | 2013



© AECOM Technical Services 2011  
Orlando  
150 North Orange Avenue, Orlando, FL 32801

T: 407 843 6552  
F: 407 839 1789

Project No. : 60222541  
Client : Boone National Guard Center

AECOM Contact : Liz.Drake@AECOM.com



# Table of Contents

Acknowledgements	4
<b>Section 01</b> EXECUTIVE SUMMARY	<b>6</b>
Study Area	
Stakeholder and Community Involvement	
Study Recommendations	
<b>Section 02</b> INTRODUCTION	<b>10</b>
Purpose	
Study Area	
Communication and Coordination Strategy	
Overview of Document	
<b>Section 03</b> COMMUNITY INVOLVEMENT	<b>12</b>
Stakeholder Input	
Community Participation	
<b>Section 04</b> STUDY AREA PROFILE	<b>14</b>
Population Growth	
Development Constraints	
Development Activity in Study Area	
Regional Infrastructure	
Environmental Resources	
<b>Section 05</b> MILITARY MISSION AND AIRPORT OPERATIONS	<b>20</b>
Military Mission and History	
Military Operations	
Airport Operations	
<b>Section 06</b> OPERATIONAL IMPACTS AND HAZARDS	<b>22</b>
Noise Zones	
Current Noise Environment	
Future Noise Environment	
Air Safety	
Other Compatibility Risks	
<b>Section 07</b> OVERVIEW OF COMPATIBILITY EFFORTS	<b>30</b>
Federal Compatibility Initiatives	
State Compatibility Initiatives	
Military and Airport Compatibility Initiatives	
<b>Section 08</b> COMPATIBILITY ANALYSIS	<b>32</b>
Land Compatibility	
Study Area Land Use	
Future Land Use	
Areas of Concern	
<b>Section 09</b> COMPATIBILITY STRATEGIES	<b>40</b>
Introduction	
Compatibility Options	
Technical Appendices	



# ACKNOWLEDGEMENTS

This study was prepared under contract with the Frankfort/Franklin County Planning Commission with financial support from the Office of Economic Adjustment, Department of Defense. The content of this document reflects the views of the study partners and does not necessarily reflect the views of the Office of Economic Adjustment.

The Boone Center Joint Land Use Study (JLUS) is a cooperative land use planning initiative between Franklin County, the City of Frankfort, the Frankfort/Franklin County Planning Commission, the Boone National Guard Center, and Capital City Airport, as well as other entities responsible for planning, development, and communication in the region.

This document serves as an ongoing framework for those local government and military actions necessary to enhance compatibility around Boone National Guard Center and Capital City Airport and improve quality of life in the surrounding community.

## JLUS Committee:

Joe Sanderson, Planning Commission - Chairman

Jane Julian, Property Owner & Envision Franklin Co. - Vice Chair

Jerry Lunsford, Developer/Realtor

Carmen Inman, Chamber of Commerce

Sherry Grim, Frankfort Home Builders

Scott Shannon, Capital City Airport

Jill Robinson, Fiscal Court

Harrie Buecker, Franklin Co. School Board Superintendent

Sellus Wilder, City Commission

Pat Layton, Realtor

John Houlihan, Kentucky Airport Zoning Commission

Keith Parker, Fish & Wildlife

Captain Joseph Sloan, KY Dept. of Military Affairs Construction & Facilities Mgmt.

Robert Hewitt, Director of Planning Franklin County

Gary Muller, Director of Planning, City of Frankfort

Maya DeRosa, Planning Supervisor

Chermie Maxwell, JLUS Secretary







# Section 1

## EXECUTIVE SUMMARY

Boone National Guard Center (Boone Center) is in central Kentucky, southwest of downtown Frankfort and the Kentucky River. Boone Center's facilities encompass approximately 374 acres and border the Capital City Airport (Capital City) to the north. The installation is home to the Kentucky Army National Guard headquarters, employs approximately 1,500 personnel, and facilitates the training of about 500 weekend Guard men and women. Boone Center is a major employer in the region and its presence as an economic anchor, along with the regular influx of Guard men and women, generates significant impacts throughout the Frankfort/Franklin County area. Kentucky's Emergency Operations Center is also currently headquartered at Boone Center.

With the support of Boone Center and area stakeholders, the Frankfort/Franklin County Planning Commission (FFCPC) sponsored and initiated this Joint Land Use Study to assess the compatibility of existing and planned regional development with Boone Center's current and future operations. As part of the study, the FFCPC established the JLUS Policy Committee, comprised of elected officials from the City of Frankfort and Franklin County, representatives from Boone Center, Capital City Airport, the Kentucky Airport Zoning Commission, the Kentucky Department of Fish and Wildlife, and the FFCPC, as well as local residents and stakeholders. The Policy Committee directed the JLUS process and assisted the project team in developing study recommendations.

### Study Area

The JLUS study area includes the Boone National Guard Center and Capital City Airport, plus off-installation land exposed to potential aviation-related impacts such as noise, aircraft safety risks or airspace restrictions due to runway proximity (see Figure 1).

### Stakeholder and Community Involvement

Active public involvement is a critical component of the JLUS. Public forums create a valuable opportunity to educate residents about training operations and the economic impact of the mission and to build trust among the military, airport, and community. Residents cited helicopter noise in areas adjacent to the base and in downtown Frankfort as an ongoing concern. The planning team also worked closely with Policy Committee throughout the planning process to identify critical issues facing Boone Center and Capital City Airport, including noise, growth pressure and future development, airfield safety zones, and improved communication.



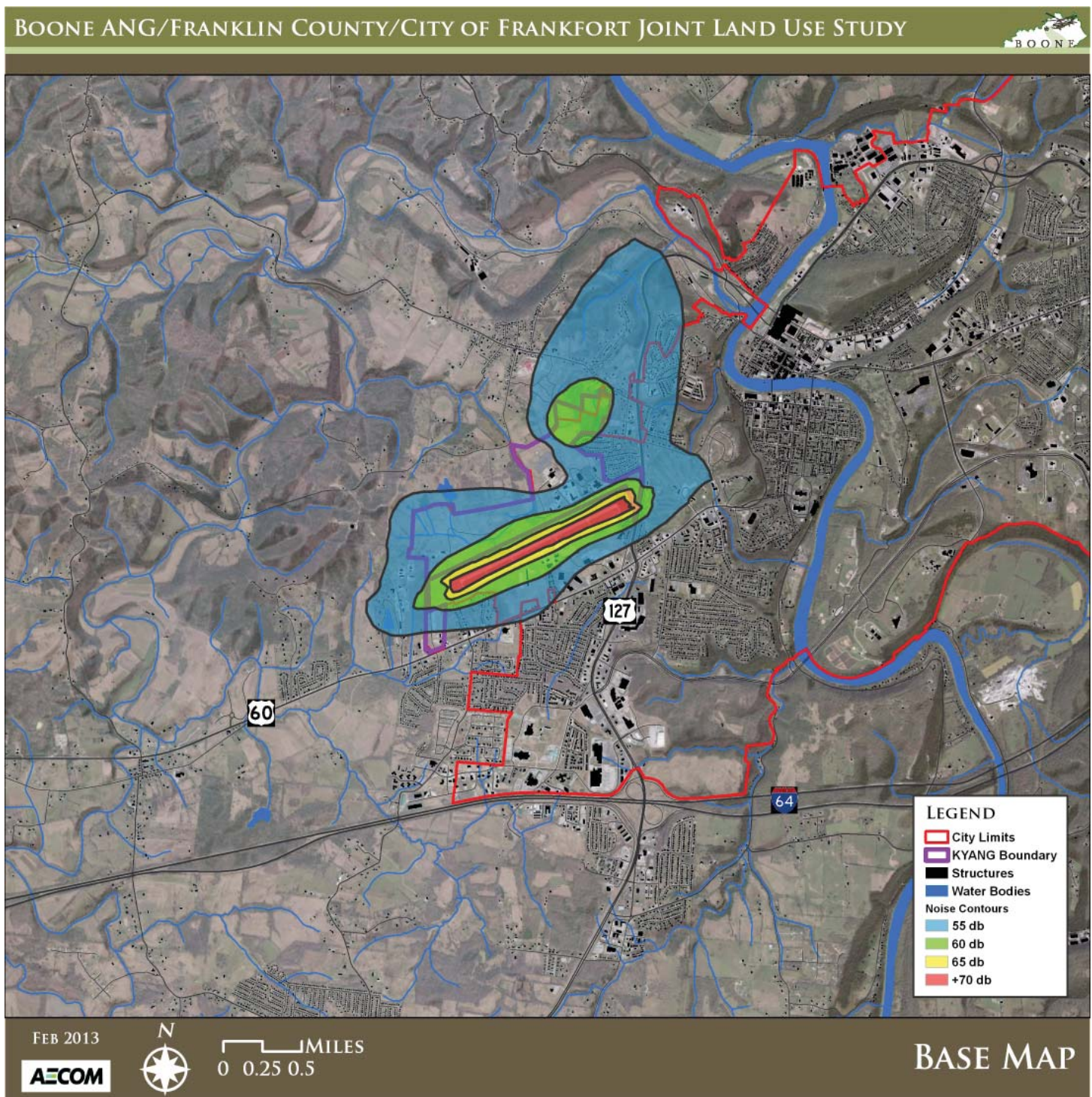


Figure 1. Study Area and Base Map



## Study Recommendations

Based on feedback received from the Policy Committee and the public, the JLUS document establishes a set of short-, mid-, and long-term actions to promote land use compatibility and strengthen coordination around the installation and airport. The tools are intended to address a variety of possible land use and operational issues, including physical adjacency to Boone Center and Capital City Airport, noise, and aviation hazards. These recommendations are tied to a series of geographic areas around Boone Center and the airport that warrant special coordination procedures or land use regulation due to their proximity to the runway. The resulting Airport Overlay District incorporates the findings of technical modeling to illustrate noise, air safety, and height issues associated with aviation activities. The report also recommends an update of the existing noise contours to reflect the anticipated change in the sound footprint when helicopter operations shift south to the relocated site of the Army Aviation Support Facility.

- Subarea 1: Planning Influence Area – encompasses key portions of the controlled airspace (FAR Part 77) around the airport and is aligned with the Suburban Area boundary from the Franklin County Comprehensive Plan; this area sets the basis for consultation among the city, county, Boone Center and the airport for specific plat and development plans
- Subarea 2: Runway Protection Zone (RPZ) – the areas immediately off of the ends of the runway, which are subject to the highest statistical risk of an aircraft accident; the zones are the basis for recommended land use regulation prohibiting any structures
- Subarea 3: Approach Zone 1 – areas beyond the RPZs that have a lower risk of an aircraft accident but still maintain some sensitivity to runway operations; this area forms the basis for recommendations limiting land uses that concentrate people
- Subarea 4: Approach Zone 2 – areas beyond Approach Zone 2 that would trigger coordination, communication and disclosure strategies
- Subarea 5: Noise Zones - areas of higher than average noise based on the most current technical modeling that considers the type and frequency of nearby aircraft activity; recommendations for these areas focus on communication and disclosure strategies, as well as noise attenuation practices for the construction of certain sound-sensitive uses
- Subarea 6: Perimeter Zone – a 200-foot buffer around the airport and Boone Center property in which taller structures or denser land uses are discouraged to maintain perimeter security for personnel

The most critical short-term recommendations are listed below. Though not specifically ranked in order of priority, the planning team has identified these actions as the most feasible for near-term implementation and most promising at addressing key compatibility issues.

- Conduct additional noise modeling to reflect the new Army Aviation Support Facility (AASF) location and new flight patterns
- Adopt Airport Overlay District
- Enhance language in current comprehensive plans as part of update
- Host a long-term link on city, county, airport and Boone Center web sites to the JLUS document and maps
- Publish and disseminate a brochure or poster that includes key maps and major JLUS findings
- Formalize and expand the procedures regarding notification of Boone Center and Capital City Airport for development proposals or major infrastructure extensions
- Create an implementation body to support adoption of recommendations and promote continued dialogue
- Incorporate Federal Aviation Regulation Part 77 standards for objects affecting airspace and State of Kentucky Airport Commission zoning laws into local policy
- Facilitate use of existing conservation subdivision design (CSO) by enabling application of existing CSO within the Airport Overlay District







## Section 2

# INTRODUCTION

### Purpose

Military installations and their surrounding communities share a close physical and economic relationship—the expansion of one necessarily impacts inter-related areas. As military installations mature, they attract new people, increase economic activity, and create new jobs to support military personnel, civilian workers, and their families. This corresponding growth increases the demand for housing, schools, and infrastructure. If this resulting development near military operations is not anticipated and planned, two undesirable outcomes can emerge—first, a greater number of residents begin to live and work in proximity to the operational impacts generated by military installations; and second, the encroachment of civilian uses can pressure installations to modify the scope of operations, possibly compromising overall mission viability. Illustrating this dynamic, the once predominantly rural areas around Boone Center have increasingly suburbanized since the installation’s construction in the 1950s and development trends indicate that areas around the installation are the likely focus of future growth within the county.

### Incompatibility

The long-term goal of the JLUS is to reduce potential incompatibility and accommodate safe local growth to sustain the regional economy. The term “incompatibility” (or encroachment) describes the operational impacts of military and airport activities on surrounding communities and the reciprocal negative effects of adjacent and unmanaged community growth on training and aviation operations.

Designated geographic boundaries that represent noise and air safety impacts – the Approach Zones and Noise Zones – extend beyond property owned by the National Guard or the Kentucky Transportation Cabinet and into surrounding community.

Section 8 explores the interaction of these areas with nearby existing land uses and foreseeable growth trends.

While noise and safety concerns can affect residents living and working around Boone Center and Capital City Airport, certain nearby civilian land uses that concentrate people, such as higher density housing or public gathering places, can also threaten aviation operations and training activities. Ongoing complaints about noise can place pressure on the military or airport to modify current operating procedures, thus reducing realistic training capabilities or curtailing business activity and economic growth.

Methods of reducing and preventing incompatibility include a menu of tools, such as compatible land use planning, infrastructure planning, real estate disclosure, site development requirements, operational changes on Boone center, and wildlife habitat conservation. One of the outcomes of the JLUS is to provide feasible and locally appropriate recommendations to minimize encroachment potential and develop clear guidance for assessing the compatibility of local growth options. This final document features a series of recommended policies and regulations for the Kentucky Army National Guard, Capital City Airport and city and county governments to consider. It is the responsibility of each participating entity to review the proposals and implement recommendations applicable for their local context.

### Communication and Coordination Strategy

The JLUS is as much about the process as it is the final document. It creates a public dialogue around the complex issues of land use, economic and population growth, infrastructure delivery, environmental sustainability, and mission change. The intent of the study is to highlight common interests—attractive development, healthier environments, more efficient



infrastructure, economic prosperity, and better quality of life—and to protect the military mission, while sustaining local growth. The resulting report is not a binding document, but a dynamic blueprint of best practices and ideas to guide military and community policy actions in the years ahead.

The JLUS Report includes a coordination strategy to guide decision makers and the general public through the current planning process and to build the framework for successful implementation and monitoring.

## Overview of Document

The JLUS document consists of the following sections.

### Executive Summary

This section summarizes the main findings and recommendations of the report.

### Introduction

This section gives an overview of the study's purpose.

### Community Involvement

This section contains a summary of committee participation and public involvement activities.

### Study Area Profile

This section provides an overview of growth trends in the study area and environmental and infrastructure issues.

### Military Mission and Airport Operations

This section contains an overview of the military mission and history, and airport operations.

### Operational Impacts and Hazards

This section identifies the impacts of the military mission on nearby civilian land and potential hazards to training activities caused by proximate off-base development.

### Overview of Compatibility Efforts

This section gives an overview of compatibility actions taken to date at the local, regional, state, and federal levels of government.

### Compatibility Analysis

This section defines land use compatibility and highlights current or foreseeable land use conflicts in the neighborhoods surrounding Boone Center based on zoning and land use plans.

### Compatibility Strategies

This section identifies general strategies to promote land use compatibility around Boone Center to reduce the risk of incompatibility in the most vulnerable areas.

### Technical Appendices

The appendices contain guidelines and a series of sample or model tools for promoting land use compatibility around Boone Center.



## Section 3

# COMMUNITY INVOLVEMENT

A successful JLUS requires active and broad participation so that strategies reflect the diversity of the community, identify concerns, and build adequate support for ongoing implementation. The JLUS planning team worked closely with the Policy Committee throughout the planning process. The purpose of this organizational structure was to ensure that the final JLUS report included a cross-section of feasible, practical solutions to compatibility challenges. The team also conducted a series of interviews and public meetings to gather critical feedback on issues and priorities. Table 1 shows the dates of public meetings and Committee sessions held throughout the planning process.

- Positive relationship between the National Guard and the community;
- Need for ongoing coordination and enhanced communication among military, airport, and community stakeholders;
- Concerns about helicopter noise immediately adjacent to the base and in downtown Frankfort;
- Proximity of wildlife and outdoor educational functions at the Salato Wildlife Center to the west of the runway; and
- Possible shifts in noise patterns as a result of relocation of the new Army Aviation Support Facility south-west of its current site.

### Stakeholder Input

In addition to Committee meetings, the planning team conducted in-depth interviews with stakeholders in the public, private and community sectors to establish priorities for the study and identify issues to be examined more fully. Stakeholders cited a wide variety of themes, including:

Table 1. JLUS Meeting Schedule

Meeting Type	Date
Policy Committee Meetings	
Policy Committee Meeting #1	April 17, 2012
Policy Committee Meeting #2	June 19, 2012
Policy Committee Meeting #3	November 8, 2012
Policy Committee Meeting #4	March 13, 2013
Public Participation Meetings	
Public Meeting #1	October 9 & 11, 2012
Public Meeting #2	February 5 & 7, 2013



## Community Participation

Active public involvement is a critical component of the JLUS. Public forums create a valuable opportunity to educate residents about training operations and the economic impact of the mission and to build trust among the military, airport, and community. Residents also educate the planning team about the operational impacts that affect quality of life in surrounding areas. Since study recommendations can affect nearby property owners, these sessions are also essential for conveying information about conservation or development options that maintain compatibility with adjacent training activities.

The planning team conducted the first of two rounds of public meetings in October of 2012. The presentations gave an overview of the process, goals, study area and possible compatibility strategies. In February of 2013, the team conducted the final round of public sessions to gather input on the draft final recommendations of the study. Members of the public could also access maps, slides and reports on the project web site at [boonelanduse.org](http://boonelanduse.org).



## Section 4

# STUDY AREA PROFILE

Split from north to south by the Kentucky River, Franklin County balances the rural character of its rolling hills and expansive farmlands with the diversity and vitality of the State Capital's historic downtown and neighborhoods. Frankfort/Franklin County's growth has been significantly influenced by the natural development constraints posed by the area's topography—and as illustrated in Figure 1, much of the northern portion of Franklin County has limited development potential because of steep slopes and rugged terrain. Therefore, the majority of Frankfort/Franklin County's past development, as well as the commercial development of recent decades, is concentrated in the southern half of the county.

### Population Growth

As of 2010, Franklin County had a total population of 49,285, including 25,527 within the City of Frankfort. Franklin County experienced a growth rate of 3.4% county-wide between 2000 and 2010; however, with a 2000 population of 27,741, the City of Frankfort experienced an 8% population loss from 2000 to 2010, indicating a trend toward decentralized, suburban growth.

According to the Frankfort/Franklin County Comprehensive Plan Update, the average household size was approximately 2.42 persons in 2000 and is forecasted to decrease to 2.30 persons by 2020. The number of new housing units forecasted

to be developed by 2020 is 1,594. Table 2 outlines the estimated housing unit demand by 2020 (Frankfort/Franklin County Comprehensive Plan Update 2010).

### Development Constraints

As of 2001, just over 80% of the county's land area was agricultural, woodlands, or undeveloped. Natural development constraints, such as floodplains and steep topography, prevent significant development in much of the land area designated as agriculture and woodlands. Franklin County land area is divided into Slope Districts based upon the severity of topographic constraints. In areas with the greatest topographic constraint, planners and decision makers can anticipate less future development. Similarly, more than 10,000 acres of the Frankfort/Franklin County land area is designated as floodplain. While some forms of development are allowed in floodplain zones, land use policy directs new land development away from these areas.

### Development Activity in Study Area

Although the land capacity of both Franklin County and the City of Frankfort can easily accommodate the 2020 population and land demand forecasts, the natural barriers influencing development will likely continue to result in a more concentrated

Table 2. New Housing Units, 2020

	Frankfort	Franklin County	Total
Single Family	657	682	1,339
Multi-Family	174	81	255
Total	831	763	1,594

Source: Frankfort/Franklin County Comprehensive Plan





Figure 1. Environmental Constraints



development pattern around Frankfort and in the southern portion of the county along US-60 and Interstate 64—and such growth could possibly increase development pressure near Boone Center’s facilities. The areas surrounding Boone Center fall within the slope district categorized as having “minimal topographic constraints” and are, therefore, more likely to attract a greater rate of development. Higher densities in the Frankfort area, if located within sensitive areas adjacent to Boone Center, could threaten Boone’s operations and, likewise, businesses and residential uses could be negatively impacted if such development is not coordinated.

Though the ongoing market downturn has dampened development activity, land surrounding Boone Center and Capital City Airport remains an attractive growth area due to its aesthetics, the presence of supporting infrastructure, such as transportation access and water and wastewater utilities, and the absence of slope constraints common in other parts of the county. Recent trends in the study area include renovations and infill development in the urban core and retail and mixed use projects along Highway 127 and near the Interstate 64 interchanges. This intensification of mostly non-residential activity, particularly near the interstate corridor to the south, poses limited compatibility issues with National Guard and airport operations.

However, a resurgence of planned residential development in areas to the north, west, and east of the installation could pose future compatibility challenges resulting from aviation noise exposure. The Villas of Berry Hill, a 115 unit condominium development, is under construction east of Boone Center. To the south and lying just north of Interstate 64, the Wellington Place Condominiums are under construction, with two buildings to be completed. Areas to the north include a preliminary plat for residential development and the installation of horizontal infrastructure (utilities and roads) to support the stalled 98-unit Pebble Brook subdivision. Land to the west of Boone Center along Highway 60 features a similarly uncompleted residential development, Armstrong Crossing, and an additional property adjacent to the Salato Wildlife Center that has been the subject of rezoning interest. Figure 2 illustrates these identified development projects.

## Regional Infrastructure

### *Public Water Service*

While much of Franklin County is served by the public water

service, rural areas, particularly in the northwestern and northeastern corners of the county, lack public service. The primary treated water source serving Frankfort and Franklin County is the Frankfort Plan Board, which has a maximum capacity of 18 million gallons of water per day. Peak demand for water within the service area is approximately 14 million gallons per day, with average demands falling below that peak number. Capacity and demand are continually monitored to anticipate changes in level of service that might be needed to accommodate growth in coming years.

In addition to the Frankfort Plan Board, five water providers serve the more rural areas of Franklin County; however, as growth continues in the outlying areas of the County, these small providers could become overburdened. The Community Facilities Plan associated with the Comprehensive Plan Update recommends that decision makers consider the feasibility of consolidating water service providers. The plan also recommends that water service be used as a planning tool, wherein water lines would be sized to accommodate only the land use type and intensity recommended by the Future Land Use Plan.

### *Sewer/Stormwater*

The City of Frankfort has a combined sewer-stormwater system. As of the date of the Comprehensive Plan, the only sanitary sewer system serving Frankfort/Franklin County is operated by the City of Frankfort, with sewer collection lines extending beyond the City limits in some areas. The Frankfort Sewer Department currently has treatment capacity of 9.9 million gallons per day, which should accommodate anticipated increases in demand corresponding to future growth. However, service might be overburdened in some areas in the outer reaches of the County as growth occurs in the coming years; therefore, to meet these increasing needs, the Frankfort Sewer Department is contemplating and prioritizing sewer line extensions and improvements as appropriate. Current sewer plans propose extending the coverage area further north through the County.

Franklin County’s sewer system has 35 ‘package’ sanitary sewage treatment plants, 11 of which are located in the southwest portion on the County. These package treatment plants are self-contained treatment systems, intended to serve smaller areas or developments with densities too low to otherwise justify service extensions. The ongoing maintenance needs of these smaller facilities can burden the Sewer Department. Additionally, on-site sewage disposal is still



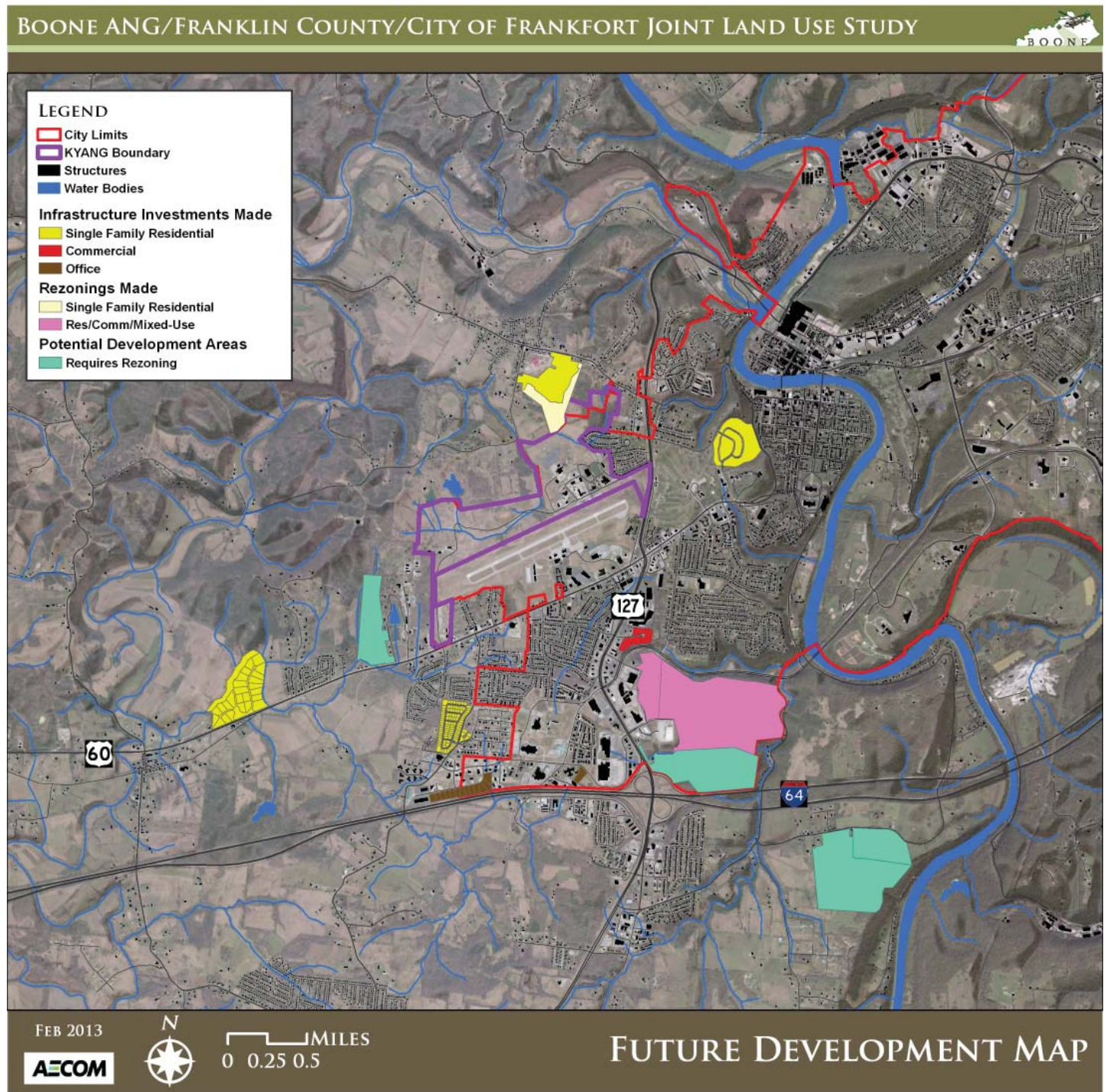


Figure 2. Development Map



utilized in areas throughout Franklin County. Such on-site systems can be environmentally problematic, as the soil structure and topography is often unsuitable for such use.

In light of these considerations, the Community Facilities Plan seeks to use development policies and implementation processes to direct new growth towards those areas with adequate sanitary sewer service and coordinate service improvements as appropriate. The areas neighboring Boone Center are currently served by the public sewer and water systems; therefore, it is unlikely that any infrastructural constraints that would limit future growth and development.

### *Transportation Infrastructure*

Major corridors providing access to Boone Center include:

- U.S. Route 60 (Louisville Road)
- U.S. Route 127 (West Plaza Connector Road)
- Minuteman Parkway

In 2000 the Kentucky Transportation Cabinet conducted a Year 2020 transportation study for the Frankfort Urban Area. According to the resulting transportation model, the following potential roadway projects could increase roadway capacity within and around the JLUS study area:

Six-Year Highway Plan (Funded FY06-FY12):

- Widen US 60 (Louisville Road) from end of truck climbing lane just west of South Benson Creek Bridge (B97) to Vicky Way
- Frankfort-Newcastle; Reconstruct US-421 from top of Bald Knob Hill at end of Reconstructed Section to Harvieland Rd
- Pavement rehabilitation and bridge widening on I-64
- Reconstruction of KY-2817 (Cardwell Lane) and C. Michael Davenport Drive

Statewide Transportation Plan:

- Widen Interstate 64 to six lanes from US 127 to US 60

### *Long Range Transportation Improvements*

*High Priority Unfunded Long-term Highway Improvement Projects:*

- Devil's Hollow Road- widen to 3 lanes from Pea Ridge Road to US-127 in Frankfort

- Widen the West Frankfort-Capital Plaza Connector (US-127) to six lanes from US-60 to Wilkinson Blvd
- Holmes Street- Reconstruct/widen with bikeway to 3 lanes from High Street to Thornhill Bypass
- Implement access management from KY-1659 to US-460
- Widen US-60 (Louisville Rd) from Evergreen Rd west to Shelby County line

*Medium Priority Unfunded Long-term Highway Improvement Projects:*

- Construct right turn lane at Metro Street
- Major widening of US-127 to 6 lanes

*Low Priority Unfunded Long-term Highway Improvement Projects:*

- Widen Wilkinson Blvd to 6 lanes from Connector to US-60
- Relocation of KY-1665 at Jones Lane to US-60 at Game Farm
- New interchange at relocated KY-2817 (Cardwell Lane)
- Reconstruct Evergreen Rd from US-127 to US-60
- New 4-lane connector from partial interchange near Hanley Lane to Glenss Creek Rd/Martin Luther King

Roadway improvements to the network serving Boone Center will improve access and mobility to and from the base; however, increased road capacity often encourages denser development patterns and growth within the areas served. Therefore, as the roadway improvements listed above are constructed, those areas surrounding Boone Center, such as the widening of US-60, are likely to experience increased growth, which could in turn increase encroachment potential and create new safety risks and additional land compatibility conflicts.



## Environmental Resources

The Frankfort/Franklin County region is rich with natural resources, including productive farmlands, undeveloped woodlands, and wildlife habitat. Franklin County and the state of Kentucky employ several conservation programs to protect the area's sensitive environments and valuable natural resources.

### *The Franklin County Soil and Water Conservation District*

The Franklin County Soil and Water Conservation District was established in 1947 as a local subdivision of state government and is responsible for the conservation and management of local natural resources. The Conservation District is governed by an elected board, composed of local landowners, farmers and producers, and representatives of the business community. The Conservation District's stated mission is "to help in the protection of Franklin County's natural resources by working hand in hand with government agencies, industry, schools, businesses and individual landowners." The Conservation District offers programs and incentives to farmers and landowners encouraging best practices for environmental conservation and water and soil protection.

### *Kentucky Agricultural District Program*

The Kentucky Department for Natural Resources, Division of Conservation administers the Agricultural District Program. This program was created to protect Kentucky's land resources and to promote and preserve the economic viability of the state's agricultural industry. The goal of the Agricultural District

Program is to protect Kentucky's prime agricultural land for production and prevent its conversion to nonagricultural uses. Land enrolled in the Agricultural District Program cannot be annexed and cannot be condemned without mitigation. Agricultural District lands are taxed at a special agricultural rate, are eligible for deferred assessment costs when water lines are extended, and receive incentives when applying for state Cost Share or applying to the Purchase of Agricultural Conservation Easements (PACE) Program.

### *Purchase of Agricultural Conservation Easements (PACE) Program*

In 1994, the Kentucky General Assembly established the Purchase of Agricultural Conservation Easement Corporation, authorizing the state to purchase agricultural conservation easements to preserve agricultural land and ensure such lands are not converted to other uses. In addition to the purchasing program, landowners are also encouraged to donate easements dedicating their land to agricultural uses in exchange for state and federal tax incentives. An area of nearly 350 acres southwest of Boone Center, bordering US-60 to the south, is P.A.C.E farmland.



## Section 5

# MILITARY MISSION AND AIRPORT OPERATIONS

### Military Mission and History

Boone Center is located in central Franklin County at the western edge of Kentucky's capital city, Frankfort. It is approximately 54 miles east of Louisville, 28 miles northwest of Lexington, and 70 miles east of Fort Knox. The facility was named 'Boone National Guard Center' in 1952 after Colonel Daniel Boone, for his contribution to the emergence of the Kentucky state militia and ultimately the Kentucky Air National Guard (KYARNG). KYARNG aviation support consolidated its operations in the City of Frankfort when the newly constructed hangar was opened at the Capital City Airport in 1959. The Kentucky National Guard Army Aviation moved into Boone Center's existing Army Aviation Support Facility (AASF) in 1971. The original AASF is used today as an aviation maintenance hangar for state aircraft.

The KYARNG has dual missions: first, "to recruit, train and deploy military personnel and units anywhere in the world when ordered by the Department of Defense" and second, "to assist state agencies and local governments during disasters and emergencies declared by the Governor."

### Military Operations

Boone Center's existing AASF is adjacent to Boone's headquarters' complex and includes two hangers and one helipad. The Capital City Airport is directly south of Boone Center. Military and civilian aircraft utilize Capital City; however, only a small portion of Boone Center's operations currently utilize the Capital City's runway. With the relocation of the AASF, however, military helicopter take-offs and departures will occur on the airport runway. KYARNG stations 21 military aircraft at Boone Center (down from 38 in 1991), including one C-12 airplane, two C-23 airplanes, 13 UH-60 Blackhawk helicopters, and 6 OH-58 Kiowa helicopters. The number of military aircraft assigned to Boone's facility fluctuates with the

availability of federal and state funding, as well as crew availability and military mission requirements. The KYANG has previously expressed interest in attracting CH-47 Chinook helicopters as part of its mission.

The following units train at the Boone Center AASF and Capital City Airport:

- 63rd Aviation Group
- HQ State Area Command (STARC)
- Recon Air Interdiction Detachment (RAID)
- Detachment 11, Operations Support Aircraft (OSA)
- Detachment 3, H Company, 171st Aviation

Boone Center's current military presence consists primarily of helicopter operations. The helicopters mainly utilize a helipad north of the Capital City runway and travel a flight pattern designed to avoid conflicts with runway traffic and to limit noise disturbances within surrounding communities. Boone Center currently operates three to four flights per day, decreased from six to eight daily flights due to budget reductions. Each operation flight lasts a maximum of 1.5 hours. Operations currently follow four primary corridors:

- To Georgetown (to the East): This flight path is designed to avoid residences.
- To Lexington (to Southeast): This flight path is primarily controlled airspace.
- To Danville (South): This operation path does not fly over significant residential development.
- To the North: This operation path flies primarily over open space, with permission from the state to operate in this area.

Boone Center currently has several expansion and improvement projects in various phases of planning. Perhaps the most significant of these projects is the previously discussed



relocation of the AASF, which is currently in the design phase and is slated for completion in 2013-2014.

Boone Center is also planning a reconstruction project for the base's main entrance and gate in order to meet the military's force protection standards, including access control redesign, security barriers, man-made buffers, and a blast wall. Additionally, limited sight distance for automobiles turning left into the base entrance from the north-bound lanes of US 127 contributes to traffic congestion, particularly during morning high-traffic hours. This issue could prompt additional improvements to the base entrance to facilitate traffic flow. In addition to these possible improvements, the KYNG Master Plan envisions additional potential expansions for Boone Center, including a centralized joint installation and business campus.

## Airport Operations

Located directly south of Boone Center, the Capital City Airport is a public-use facility encompassing 355 acres. Previously under the purview of the Department of Military Affairs, the Capital City Airport was placed under the management of Kentucky's Transportation Cabinet in 2006.

Capital City utilizes a 5,900-foot single runway and is home to 81 aircraft, including single and multi-engine airplanes and rotorcraft. The Capital City Airport is primarily used by smaller aircraft and accommodates an estimated 34,200 aircraft operations per year, including state government and National Guard operations, corporate activity, and pleasure flying. Capital City currently has 41 aircraft T-hangars, 17 tie-down spots, and has plans to open an education hangar intended for aviation programs in partnership with area high schools.

Capital City's runway was extended by 900 feet to the west in 2006; however, plans are in place to remove 400 feet from the east end of the runway in order to meet runway safety area standards, which require that airport facilities maintain a 1,000-foot clear zone around runways. This 400-foot reduction will slightly limit the size of aircraft that can be accommodated by Capital City, but will not significantly reduce the airport's operations.

The airport has established noise abatement procedures intended to limit noise exposure to surrounding residential areas. Capital City directs pilots to limit residential overflights when arriving to or departing from the airport and also sets forth the following guidelines:

- For Runway 06 departures, maintain runway heading until reaching 1000' AGL before making turn on course.
- For community compatibility and noise mitigation purposes, runway 24 is the preferred departure runway.

Capital City is also considering plans to raise the altitude of flight paths over residential areas. This flight path alteration, along with the runway reduction, will further lower impacts to residential areas.



## Section 6

# OPERATIONAL IMPACTS AND HAZARDS

Routine training activities at Boone Center generate impacts that can potentially affect quality of life for residents in neighboring communities. Such impacts include noise and vibration from overhead flights and the risk of injury due to an aircraft accident. Likewise, military and airport operations are vulnerable to hazards created by nearby civilian activities that concentrate people or noise sensitive users, obstruct air space, compete for electromagnetic spectrum use, or generate light or other visual impairments. Understanding the overlapping spatial patterns of these impacts around Boone Center and the airport is essential for promoting compatible and coordinated land use decisions.

### Noise Zones

To assist the surrounding communities in land use decisions, the Department of Defense uses decibel noise contours to illustrate the exposure to noise associated with aviation activities. The zones are as follows:

- Noise Zone III: This is an area around the source of noise in which the DNL is greater than 75 dBA. This zone is considered an area of severe noise exposure and is deemed unacceptable for noise sensitive activities, such as housing.
- Noise Zone II: This zone is considered to have significant noise exposure and is normally unacceptable for noise-sensitive land uses. It consists of an area where the DNL is between 65 and 75 dBA.
- Noise Zone I: This zone, considered to have minimal noise exposure, includes areas in which DNL is less than 65 dBA and is acceptable for most types of land uses.

### Current Noise Environment

Aviation activities at Boone Center's AASF and the Capital City Airport are the primary contributors to the existing noise environment. The geographic context of Boone Center and the Capital City Airport affects the noise generated through Boone Center's operations—the hilly topography surrounding these facilities can funnel noise, thereby exacerbating the effect. Therefore, even greater attention must be given to noise abatement and land use coordination strategies.

A noise analysis was conducted as part of the 2005 Environmental Assessment completed for Capital City Airport's runway expansion. According to this noise analysis, during the period of March 2006 to March 2007, KYARNG executed approximately 5,370 UH-60 Blackhawk operations and 740 OH-58 Kiowa operations at the Boone Center AASF. An operation is defined as either a takeoff or a landing.

According to the analysis conducted as part of the 2005 Environmental Assessment, noise in excess of 65 dBA is almost wholly contained on installation and airport property and, therefore, poses a limited risk of incompatibility with surrounding areas. It should be noted, however, that modeling used to depict the noise environment produces a snapshot of average daily sound levels based on factors such as the frequency, timing and mix of aircraft and helicopter operations. Noise occurs beyond the zones as identified in Figure 3. Input from residents and stakeholders indicates noise exposure in areas west of Boone Center along Highway 60, such as the Hunter's Trace subdivision and Hawkeegan neighborhood, and neighborhoods to the east of the runway centerline in south Frankfort.



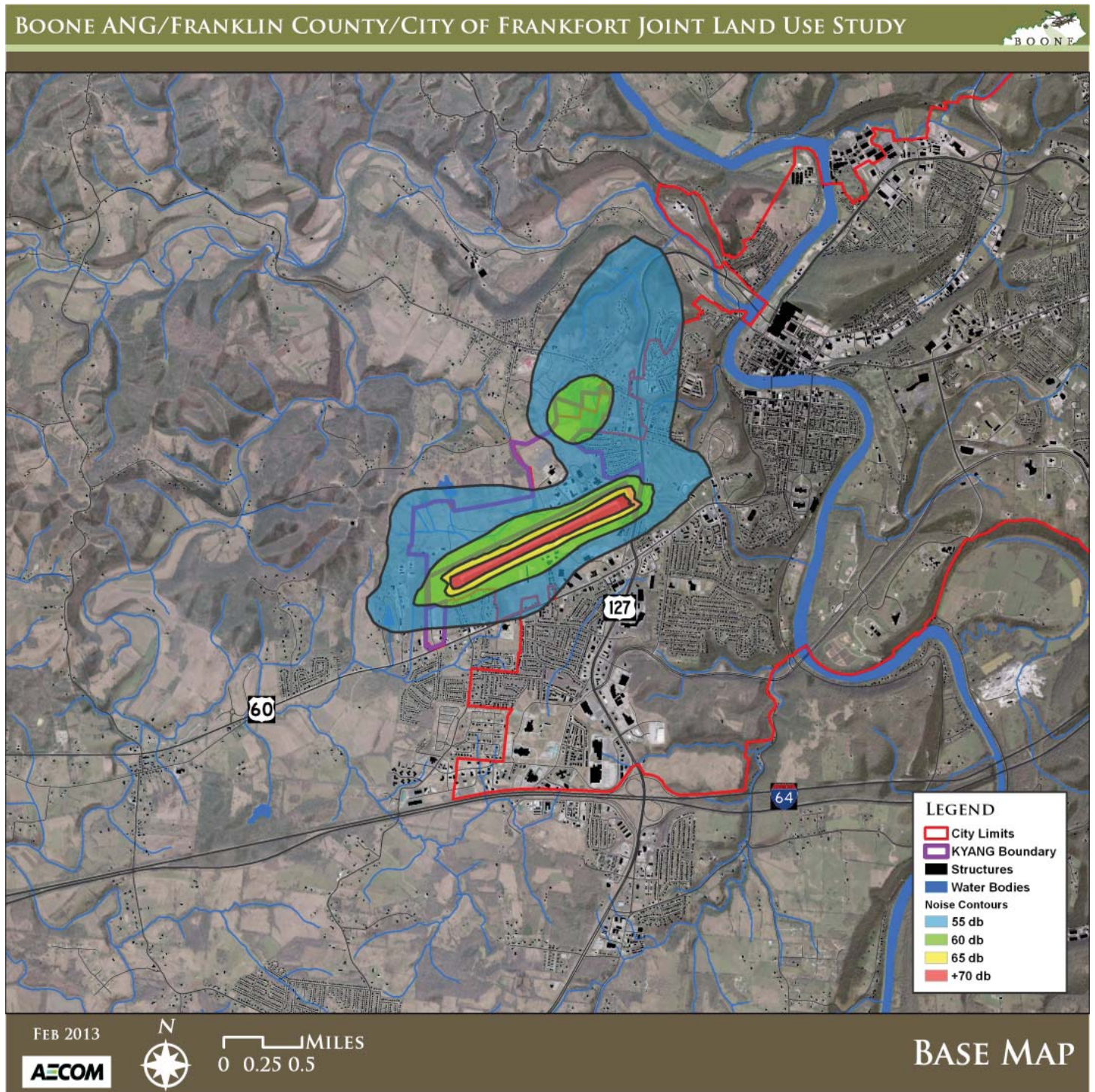


Figure 3. Base Map and Noise Contours



## Future Noise Environment

Proposed modifications to Boone's operations could alter the existing noise environment. The National Guard has expressed interest in adding up to six CH-47 Chinook helicopters at Boone Center. The Chinook is a large twin-engine heavy-lift helicopter with tandem rotors. There is currently no definitive timeline or commitment for hosting a Chinook mission. However, if implemented the addition of these helicopters could result in an expansion of the existing noise footprint due to an increase in the number of daily flight operations and the loudness of the aircraft relative to the UH-60 Blackhawks.

As previously noted, Boone Center has plans to shift AASF operations to a site just north of the western end of the Capital City runway. Figure 4 illustrates the location of the new AASF. Eventual disuse of the existing helipad would decrease the community's noise exposure to the north. Since helicopters will operate within the existing flight paths of airport runway, the noise footprint to the south is anticipated to remain similar to current contours but with a slight increase in 55 dBA exposure to the east and west. Figure 5 shows the expected change in the noise environment based on proposed AASF activity. It should be noted that the graphic is only a conceptual illustration of future noise impacts and does not reflect the results of technical modeling. As described later, the JLUS recommends a near-term update of the noise contour zones using accepted modeling techniques. Any proposed noise mitigation strategies should be linked to the most accurate noise modeling analysis.

## Air Safety

### *Runway Airspace Imaginary Surfaces*

Civilian airports, as well as the Department of Defense, utilize imaginary, three-dimensional areas around airfields that define the spaces that must be kept clear of obstacles to ensure safe flight operations.

Every airport in the United States that falls under Federal Aviation Administration (FAA) jurisdiction is assigned a series of three-dimensional zones encompassing volumes of space, for which the airport has jurisdiction over obstructions. The purpose of these 'Imaginary Surfaces' is to protect the airport airspace from vertical intrusions such as buildings, towers, and trees that could interfere with the safe operation of aircraft.

Dimensions for these surfaces are determined based on the type of approach available for the runway and are detailed in Part 77 of Federal Aviation Regulations. The Imaginary Surfaces for Boone Center/Capitol City Airport are shown in Figure 6 and include the following:

- **Primary Surface:** The Primary Surface encompasses the runway and is the only surface located on the ground. The Primary Surface is 500 feet wide and extends 200 feet from each runway end. This zone must be kept clear of all objects except those critical to aircraft navigation such as runway signs and lights.
- **Transitional Surface:** The Transitional Surfaces rise from the longer sides of the Primary Surface and Transitional Surfaces at a rate of 1 vertical foot for every 7 horizontal feet, up to a maximum height of 150 feet above runway elevation.
- **Approach Surfaces:** For runways that operate non-precision instrument approaches (like the runway at the Capitol City Airport), the Approach Surfaces rise from the ends of the Primary Surface at a rate of 1 vertical foot for every 34 horizontal feet, up to 10,000 horizontal feet. This is one of the most important surfaces and must be kept clear of any objects that could interfere with landing or taking off.
- **Horizontal Surface:** The Horizontal Surface is a flat surface 150 feet above runway elevation, extending outward to arcs 10,000 feet in radius from the ends of the runway.
- **Conical Surface:** The Conical Surface rises from the outside edge of the Horizontal surface at a rate of 1 vertical foot for every 20 horizontal feet, up to a maximum height of 350 feet above runway elevation.

The approach surfaces are critical overlay surfaces that reflect take-off and landing movements at Capital City Airport. Proximity to the runway exposes property beneath these surfaces to several operational impacts, including higher noise levels, the potential for physical or visual interference with flights, and the higher statistical risk of an aircraft accident relative to outlying airspace zones. In recognition of these impacts, FAA policies and standards suggest limiting concentrations of people, wildlife attractants, visual obstructions, tall structures, and noise sensitive developments, particularly as approach zones near the runway.



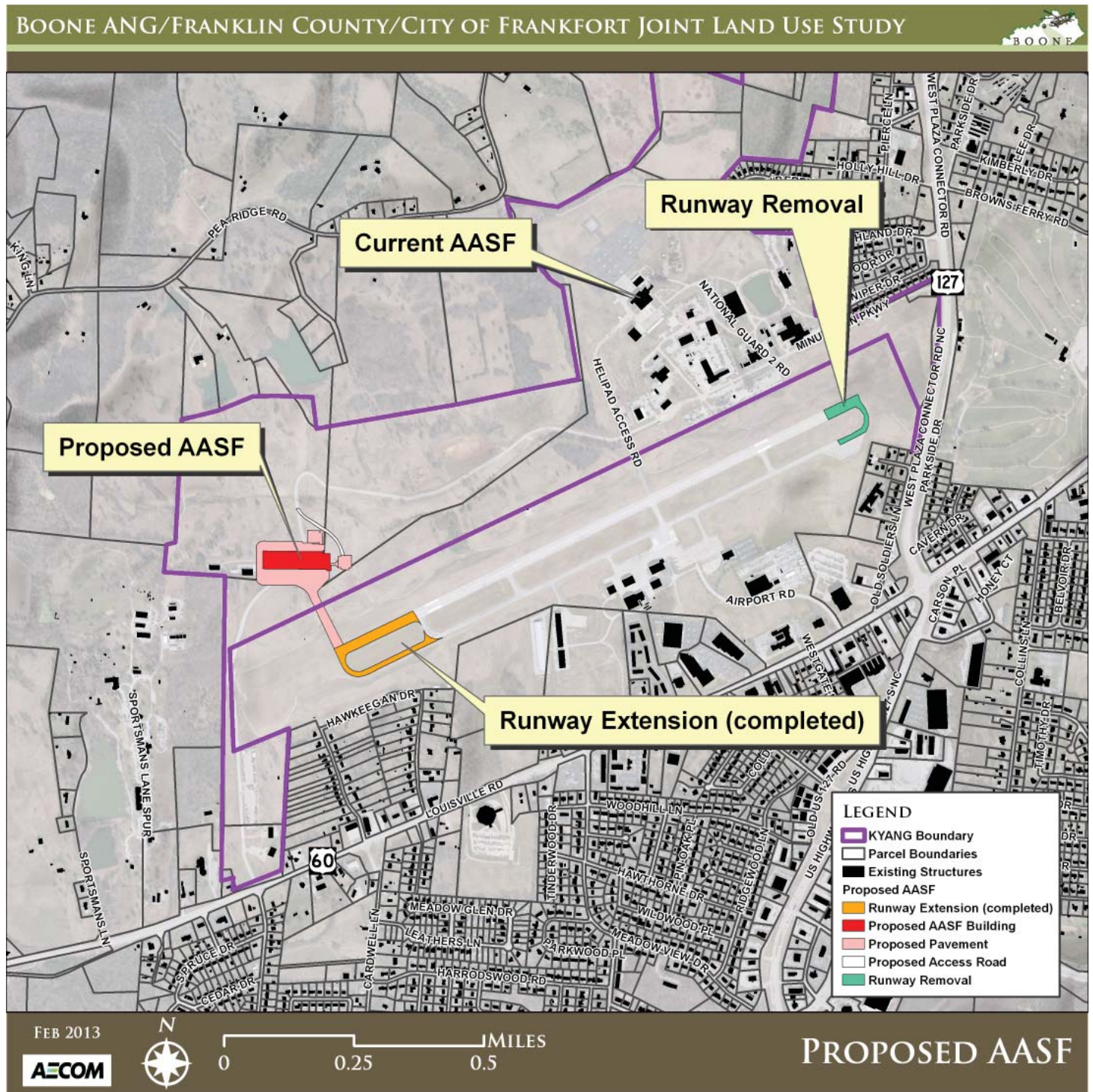
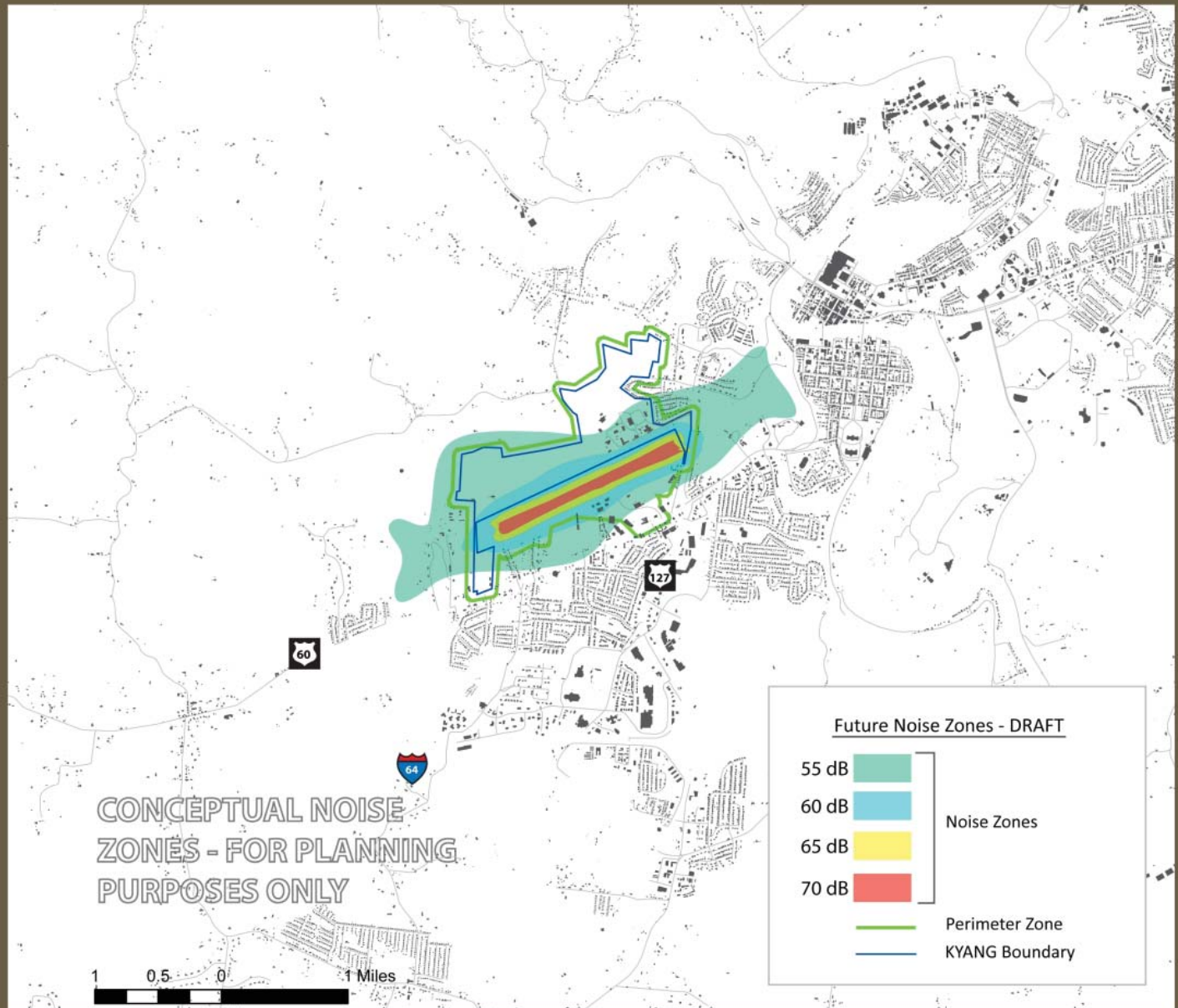


Figure 4. New Army Aviation Support Facility Site



## BOONE ANG/FRANKLIN COUNTY/CITY OF FRANKFORT JOINT LAND USE STUDY



FEB 2013

AECOM



## CONCEPTUAL FUTURE NOISE ZONES

Figure 5. Estimated Noise Contours of New AASF



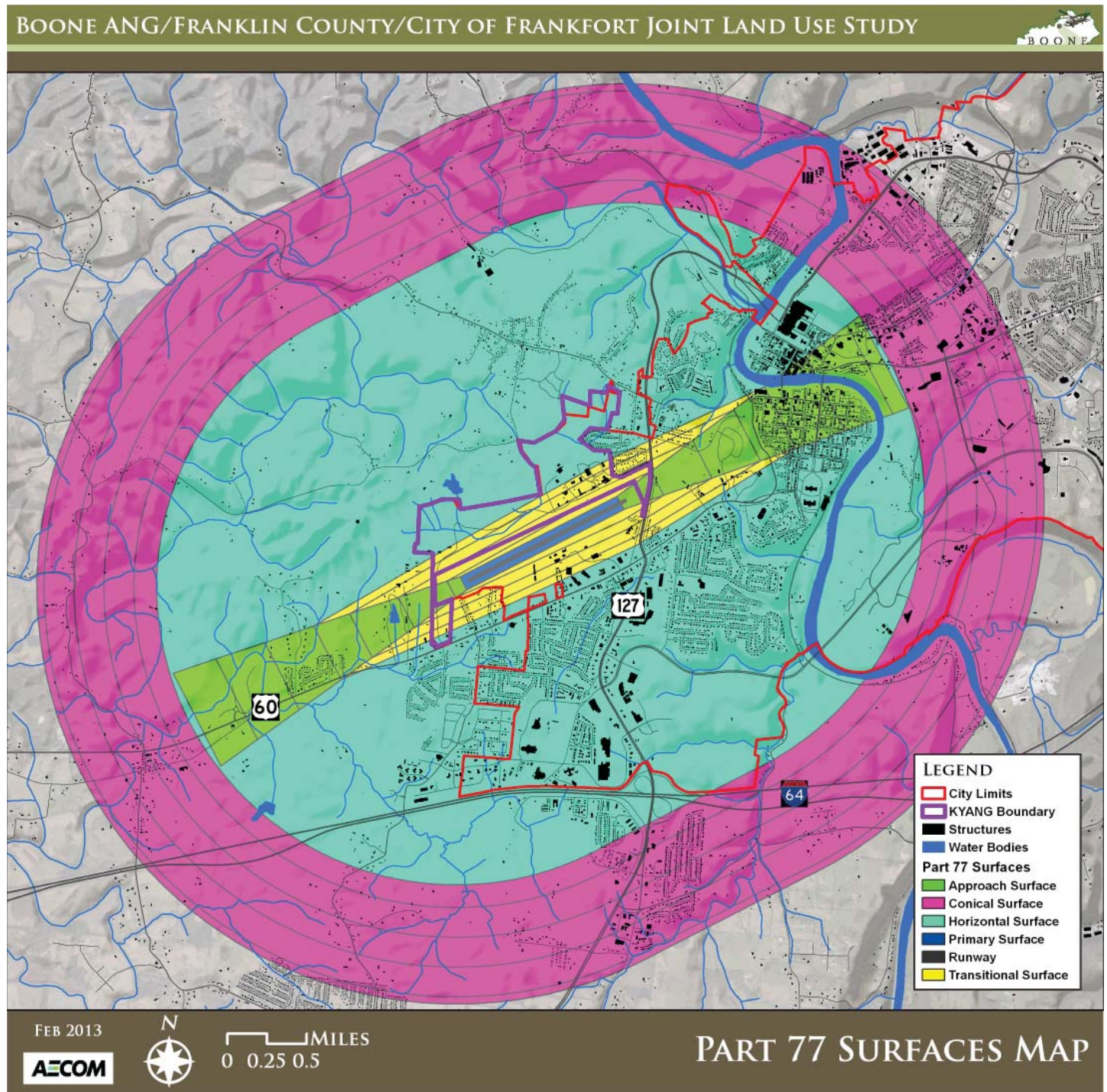


Figure 6. Imaginary Surfaces Map



## Other Compatibility Risks

As previously noted, incompatibility occurs when physically adjacent military and civilian land uses generate one or both of the following effects:

- Nearby community development interferes with the ability of the military to perform its mission or causes modifications to military operating procedures; or
- Members of the public are exposed to a higher than normal levels of operational impacts associated with military activities, such as noise or the risk of an aircraft mishap.

While noise and air safety risks are among the most common and visible of potential land use conflicts due to proximity to military operations, a variety of development factors can create compatibility challenges, including:

- Vertical obstructions that can act as a physical intrusion into active air space, particularly for aircraft participating in low altitude operations;
- Civilian devices, such as radios, radars, and keyless entries, that transmit within military assigned frequencies and can affect electronic systems and communications equipment;
- Outdoor lighting systems that allow significant light to travel upward into an otherwise darkened sky, interfering with nighttime training or the use of night vision goggles;
- Uses, such as landfills or standing bodies of water, that attract birds or other wildlife and thus increase the risk of interference with aircraft;

- Congested airspace that requires aviation entities to alter flight paths or operational procedures;
- Any physical emission into the air, such as dust or steam, that could impair pilot vision, as well as lighting and visual markings that could distract pilots;
- Threatened and endangered species that require protection through avoidance or habitat preservation and thus could diminish the size and flexibility of available training space; or
- Development directly adjacent to the installation boundaries or other factors that could reduce the security of the perimeter.







## Section 7

# OVERVIEW OF COMPATIBILITY EFFORTS

This section gives an overview of compatibility efforts undertaken to date by federal, state, and local partners to promote land use compatibility around Boone Center. The existing policies below can form the basis for subsequent recommendations to reduce compatibility risks and highlight potential implementation partnerships. Any identified gaps may also indicate opportunities to strengthen regulatory approaches around Boone Center and Capital City Airport.

### Federal Compatibility Initiatives

#### *Joint Land Use Study*

In 1985, the Department of Defense (DoD) initiated the Joint Land Use Study (JLUS) program to create a community-based framework for land use planning around military installations. The JLUS process encourages residents, local decision-makers, and installation representatives to examine current and foreseeable land use conflicts and develop collaborative solutions that balance military and civilian interests. Participating partners initiated this JLUS effort for the region around Boone Center and Capital City Airport.

#### *Readiness and Environmental Protection Initiative*

Once specifically placed in remote areas, military installations are now often in the path of advancing exurban development or have generated external growth through spinoff economic activities. Over the past decade, the DoD has increasingly recognized incompatibility as a major constraint in safely and effective mission performance.

In an effort to protect the future use of installations and training land, the FY2003 National Defense Authorization Act authorized the Military Services (Army, Navy, Marine Corps and Air Force) to enter into agreements with non-federal conservation organizations to acquire real estate in the vicinity of military installations such as bases, posts and forts.

The Readiness and Environmental Protection Initiative (REPI) grants the military the ability to enter into agreements with eligible entities, such as local governments, non-governmental organizations, and willing land owners to secure conservation easements on property in the vicinity of, or ecologically related to, a military installation or military airspace.

The agreements enable private organizations to acquire, on a cost-shared basis, development interests in the properties of voluntary sellers. The property owner typically continues to hold the title for the land, but receives monetary compensation and tax breaks to maintain the encumbered property in a highly limited use that preserves habitat and avoids interference with the operational procedures of the nearby installation. REPI is the fastest growing conservation-based program in the federal government today.

The DoD has also formed a partnership with the United States Department of Agriculture (USDA) to conserve sensitive lands near military bases around the nation. Through the USDA, military planners can now access the resources of existing easement programs, such as the Farm and Ranch Lands Protection Program, the Wetlands Reserve Program, and the Grassland Reserve Program. The DoD's promotion of conservation and integrated planning enhances the choice of encroachment reduction tools available to today's installations and defense communities and supplements smart growth land use strategies pursued by many local governments.

### State Compatibility Initiatives

Kentucky Revised Statute 183.861 establishes the Kentucky Airport Zoning Commission (Commission) and establishes its jurisdiction over the zoning, land use, structures, and airspace of all military airports, public-use airports, heliports, seaplane bases, and certain private airports within the state.

Statute 183.867 requires that every military and public use



airport, heliport, or sea plane base file maps with the Commission showing the airport and surrounding areas used for approach and landing. The Commission in turn designates certain areas as falling within its zoning jurisdiction according to the standards and regulations set forth by the Federal Aviation Administration. In adopting zoning regulations for those areas falling within its jurisdiction, the Commission must consider user safety, flying operations, surrounding terrain, existing structures, safety standards, future development needs, surrounding density, the protection of public investment, the public interest in developing a public air transportation system, and the opinions of adjacent land owners. The Commission also has the authority to acquire property where needed and establish height regulations for those lands surrounding airports.

Title 602 Chapter 50 outlines allowable land uses on properties within the Commission's jurisdiction. Provided such uses do not constitute a hazard to air navigation, commercial, industrial, residential, bank and financial institutions, retail and wholesale stores, warehouses and storage facilities, manufacturing and operation facilities, office and service facilities are allowable in the Commission's jurisdiction upon the application and issuance of an airport land use permit. Title 602 Chapter 50 also outlines the procedures and requirements for acquiring airport land use permits and for altering or constructing structures on property within the Commission's jurisdiction.

## Military and Airport Compatibility Initiatives

Routine training flights and operations expose adjacent residential areas to noise disturbances, which cannot be eliminated entirely but can be mitigated. Boone Center's helicopter flight patterns are designed to avoid conflicts with Capital City's runway traffic and also to minimize impacts within surrounding communities. Boone Center utilizes the following noise mitigation strategies to limit community exposure:

- "Fly Neighborly" program: noise avoidance areas and minimum flight elevations established around known noise-sensitive areas in Frankfort.
- Aircraft are not flown below 500 feet AGL, except as authorized in NGR 95-1.

- Cruising altitude should be at or above 1,500 feet AGL except:

- ◊ During Take offs and landings
- ◊ ATC requirements and approved helicopter routes
- ◊ Weather and cloud clearance requirements
- ◊ In-flight emergencies

KYARNG limits night operations at Boone Center to Tuesday through Thursday nights to minimize noise exposure to adjacent communities. Additionally, night flights generally take off of the Capital City Airport runway, rather than the helipad, to further reduce residential exposure to noise disturbances. Helicopter operations will not be conducted in or around Capital City Airport from 11:30 pm-6:00 am, except as approved by AASF Commander or for RAID missions.



## Section 8

# COMPATIBILITY ANALYSIS

### Land Compatibility

In the context of military installations, compatibility refers to land uses that can exist next to each other without causing interference with military exercises or exposing people to undue safety risks or excessive noise disturbances. Military aviation activities raise compatibility issues when located in near proximity to the following land uses:

- Noise sensitive uses, such as housing, schools, medical facilities or places of worship;
- Uses that tend to concentrate people (certain higher residential densities, schools, churches, hospitals);
- Uses that can interfere with safe air navigation, such as tall structures, or activities that throw off excessive lighting, smoke or dust and may impair vision; and/or
- Uses that attract birds and other wildlife that can interfere with safe aviation.

For purposes of evaluating compatibility in designated noise and air safety zones, the JLUS draws guidance from several sources, including The Federal Interagency Committee on Urban Noise Guidelines for Considering Noise in Land Use Planning (1980), the Land Use Compatibility Guidelines for APZs (Department of Defense 1977, the 1999 AICUZ Program Manager's Guide, Federal Aviation Administration (FAA) regulations and policies and Kentucky Administrative Regulations, Title 602, Chapter 50 Airport Zoning Commission.

In addition to the noise exposure analysis discussed earlier, the Department of Defense assesses the potential hazards associated with aviation activity based on historical data, estimating where military aviation accidents are more likely to occur and the size of the area that could be affected. Accidents are a very low probability but high consequence occurrence for both pilot and nearby civilians. Military aviation hazards are categorized into three zones: Clear Zone (CZ), Accident Potential Zone I (APZ I), and Accident Potential Zone II (APZ II).

Despite the presence of military activities, Capital City Airport operates as a civilian, Federal Aviation Administration controlled facility and thus has not participated in a Air Installation

Compatible Use Zone (AICUZ) study or been assigned military-related aviation safety zones. The potential for aircraft accidents differs between military and commercial/general aviation operations due to the variety of aircraft used, the type of missions, and the frequency of training flights. The planning team uses AICUZ compatibility guidance to demonstrate the basic planning concept that properties immediately beyond the ends of runways and along approach and departure flight paths have a higher risk for aircraft accidents than areas farther removed from the runways (see Technical Appendix for DoD land use guidance).

To illustrate the greater safety risk associated with proximity to the runways and to establish the physical basis for land use and other compatibility recommendations in this JLUS, the planning team uses FAA-established zones, including the Runway Protection Zone (RPZ) and Approach Zones 1 and 2. The descriptions below refer to the length and width of the zones but it should be noted that as three-dimensional spaces these areas also contain minimum heights that should be free of physical intrusion to maintain air safety.

**Runway Protection Zone (RPZ)** - The RPZ is a trapezoidal shape centered on the extended centerline of the airport runway. The size of the RPZ for any particular airport is a function of the type of aircraft and the approach visibility minimum associated with the regulated runway. The RPZ as shown in Figure 7 for Capital City Airport is 1,715 feet in length and 500 feet in its initial width, broadening to 1,010 feet at its concluding point. These RPZ dimensions reflect the maximum operational capabilities of the airport rather than its current activities and thus provide the highest level of protection for aircraft and nearby properties.

The purpose of the RPZ is to protect people and property on the ground. Current FAA guidance emphasizes full airport control of property within the limits of the RPZ when feasible and calls for the entire zone to be clear of all above-ground objects. The FAA has also issued an interim policy to clarify land use compatibility within the RPZ. The September 2012 memorandum specifies that the following new uses should be reviewed and, when possible, avoided or mitigated to reduce the introduction of safety risks within the RPZ:



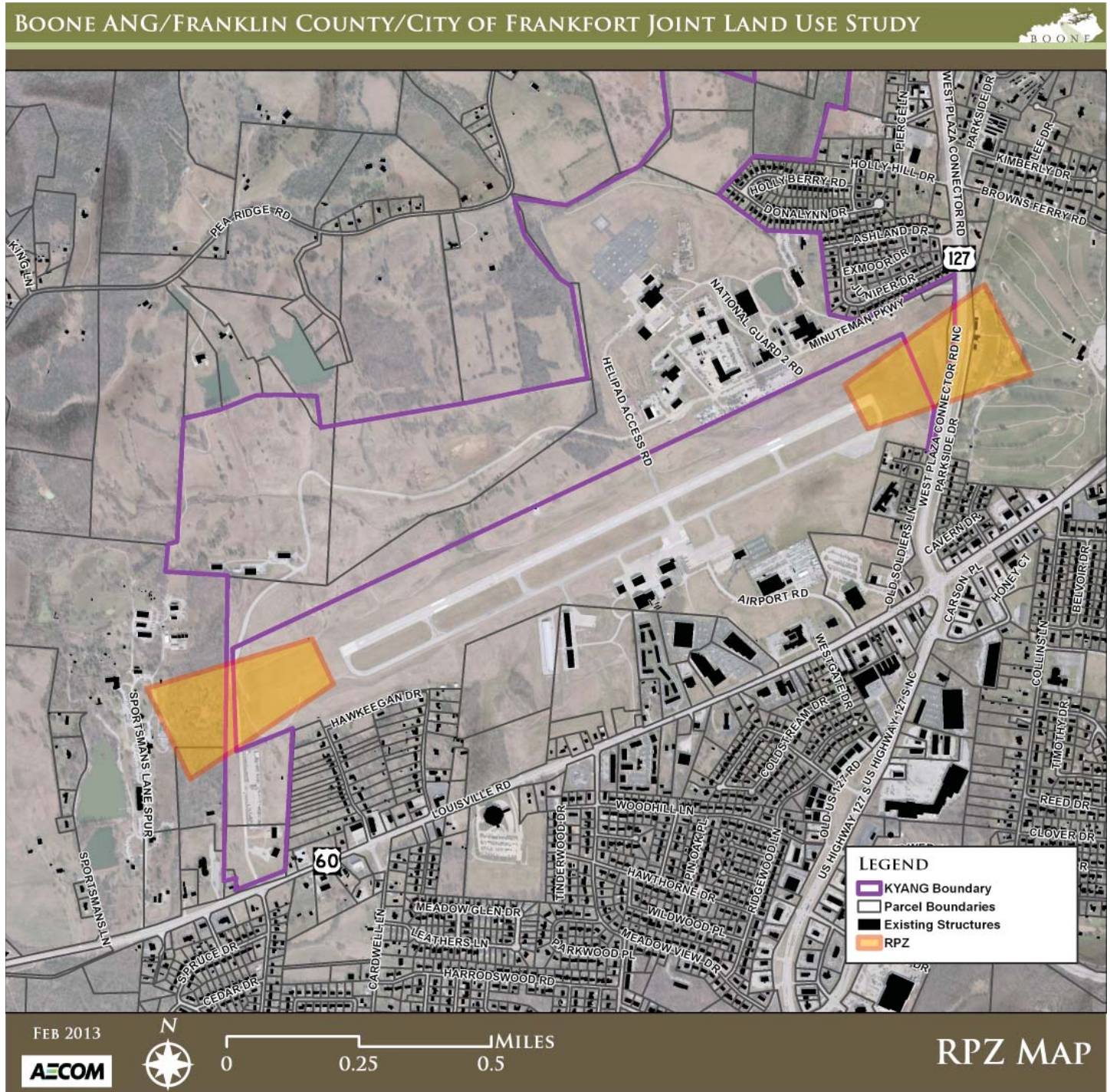


Figure 7. Runway Protection Zone



- Buildings and structures (Examples include, but are not limited to: residences, schools, churches, hospitals or other medical care facilities, commercial/industrial buildings, etc.)
- Recreational land use (Examples include, but are not limited to: golf courses, sports fields, amusement parks, other places of public assembly, etc.)
- Transportation facilities. Examples include, but are not limited to:
  - ◊ Rail facilities - light or heavy, passenger or freight
  - ◊ Public roads/highways
  - ◊ Vehicular parking facilities
- Fuel storage facilities (above and below ground)
- Hazardous material storage (above and below ground)
- Wastewater treatment facilities
- Above-ground utility infrastructure (i.e. electrical substations), including any type of solar panel installations.

The FAA will incorporate RPZ land use policy into its ongoing update of the Land Use Compatibility Advisory Circular, which is slated for publication in 2014. The guidance contained in the interim memorandum (see Technical Appendix) serves as the basis for the Airport Influence District land use recommendations identified in the next section.

**Approach Zone 1 (AZ 1)** - AZ 1 is an overlay surface that encompasses a critical approach and departure area for the runway at Capital City Airport. This trapezoidal zone extends 3,793 beyond the RPZ, starting at 1,750 feet in width and flaring to 2,875 feet. Reflecting the principal that physical distance from the runway reduces the risk of an aircraft accident as well as noise exposure, land use policy for this area is typically more relaxed than RPZ standards. Common approach zone guidance recommends against denser concentrations of people, wildlife attractants, visual obstructions, tall structures, and noise sensitive developments.

**Approach Zone 2 (AZ 2)** - AZ 2 is the outer most approach zone identified for the Capital City Airport and as such has the lowest levels of associated safety risk and noise. This zone extends 3,788 beyond APZ 1 and widens from 2,875 to 4,000 feet.

## Study Area Land Use

The Kentucky Department of Fish and Wildlife Resources (KDFWR) occupies the land directly west of Boone Center and the Capital City Airport and includes KDFWR's office complex and the 132-acre Salato Wildlife Center and Game Farm. This site is home to elk, bobcat, quail, turkey, deer, eagles, and other protected wildlife and attracts approximately 80,000 to 100,000 visitors per year. Beyond KDFWR office facilities, the property consists of woodlands, open meadows, and trail systems. KDFWR currently has no plans to expand the physical footprint of the overall site though they plan to construct a new administrative building. The agency has expressed interest in partnering with the National Guard to pursue potential conservation easements on adjoining land. Portions of the KDFWR property currently lay within the 55 and 60 db noise zones; KDFWR representatives have indicated no significant disturbances to wildlife or visitors resulting from noise exposure.

As a result of Capital City's extension of its runway in 2006, the KDFWR parking lot falls within the current RPZ. The remainder of KDFWR land within the RPZ is undeveloped woodlands and open space. The Department of Military Affairs and Capital City Airport has previously communicated and coordinated with KDFWR on military or airport projects potentially affecting the game farm site. KDFWR supported the Capital City runway expansion project and received notice when Capital City removed trees bordering KDFWR's property on Game Farm Road. The area extending beyond the KDFWR site to the west is primarily low density residential and agricultural land.

U.S. Route 127 borders the Boone Center/Capital City facilities



to the east. U.S. Route 127 and Juniper Hills Golf Course fall within the RPZ. Portions of U.S. Route 127 and the golf course also fall within the 55 and 60 db noise zones. Areas designated as 'Suburban Residential' and 'Suburban Business Center' border Boone Center along the northeast corner. The residential areas in this northeast corner contain a mix of single family and multi-family. Further east is an area designated as 'Commercial Center,' with 'Suburban Residential' to the north.

The Capital City Airport abuts Boone to the south and is on a 355-acre site, including a 5,900-foot runway, one full-service fixed-base operator, and an aircraft maintenance shop. The area directly south of Capital City is designated as 'Suburban

Business Center' and consists predominantly of commercial uses along Louisville Road/U.S. Route 60. Just south of this commercial corridor, the land use becomes 'Suburban Residential.' An area designated as 'Suburban Residential' also borders Boone Center at the southwest corner.

The land directly to the north of Boone is predominantly Suburban Residential but quickly transitions to undeveloped farmland. Tables 3 and 4 outline the total acreage of zoning uses falling within the 55db and 60 db noise contours, which are illustrated in Figures 7 and 8. The current noise zones will be updated to reflect the AASF relocation.

Table 3. City of Frankfort Zoning Acres within dB Range

Zoning	Acres within dB Range			
	55 dB	60 dB	65 dB	70 dB
CL	1.08			
IC	2.41			
PC	11.38			
PM	1.09			
PO	4.18	0.54		
RA	29.34			
RB	22.62	2.45	0.19	
RC	20.91			
RD	4.93			
RH	39.37	4.49		
RL	0.74			
SG	359.81	196.50	74.16	56.95
Subtotal = 833.13				

Table 4. Franklin County Zoning Acres within dB Range

Zoning	Acres within dB Range			
	55 dB	60 dB	65 dB	70 dB
CG	2.719			
CH	25.19			
CRR	263.04	12.25		
IG	48.47			
PO	0.06			
RB	240.75	43.4		
RR	18.9	4.75		
SG	7.56			
Subtotal = 667.11				

Source: Frankfort/Franklin County Comprehensive Plan



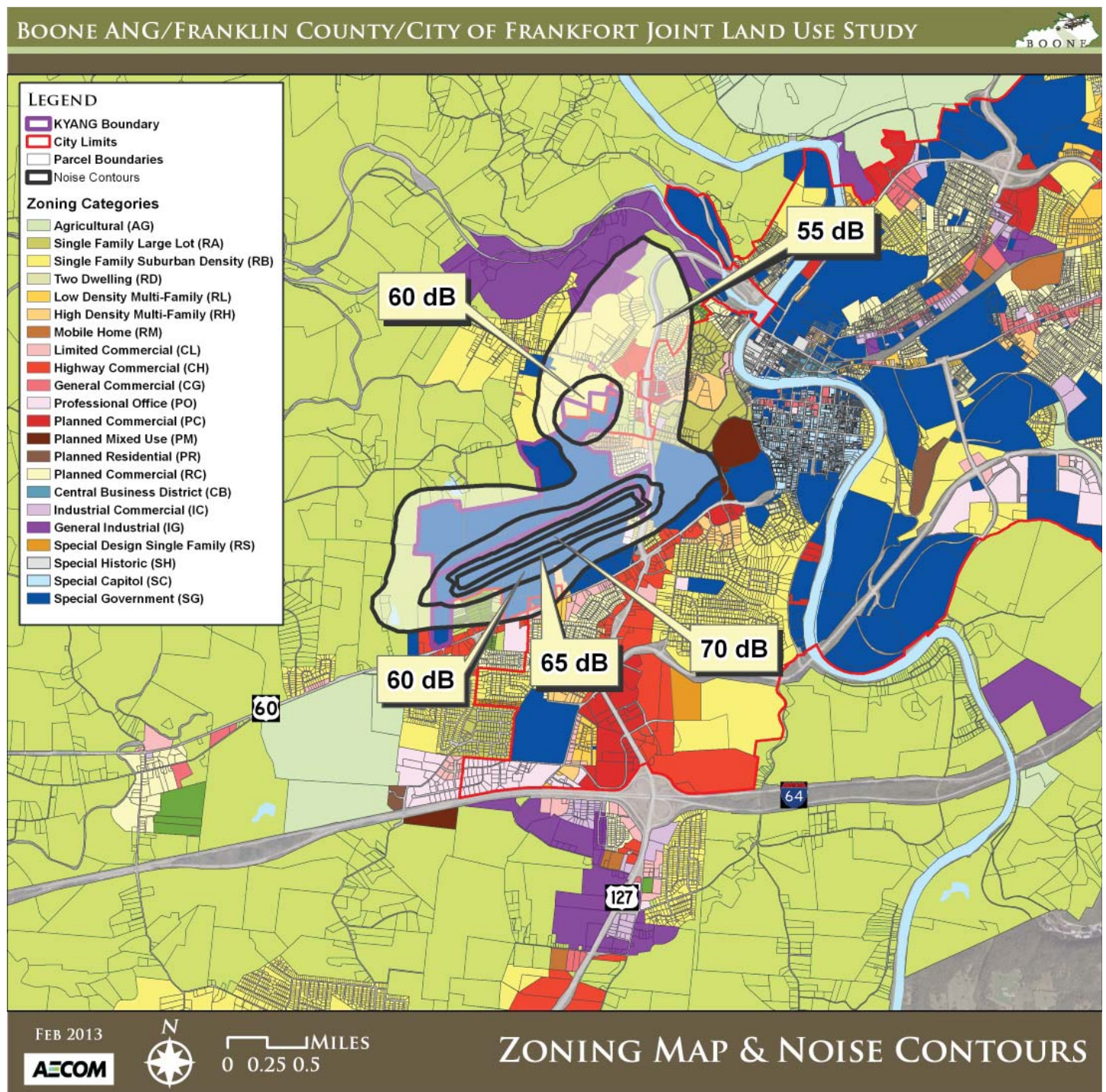


Figure 7. Zoning and Noise Contour Map



## BOONE ANG/FRANKLIN COUNTY/CITY OF FRANKFORT JOINT LAND USE STUDY

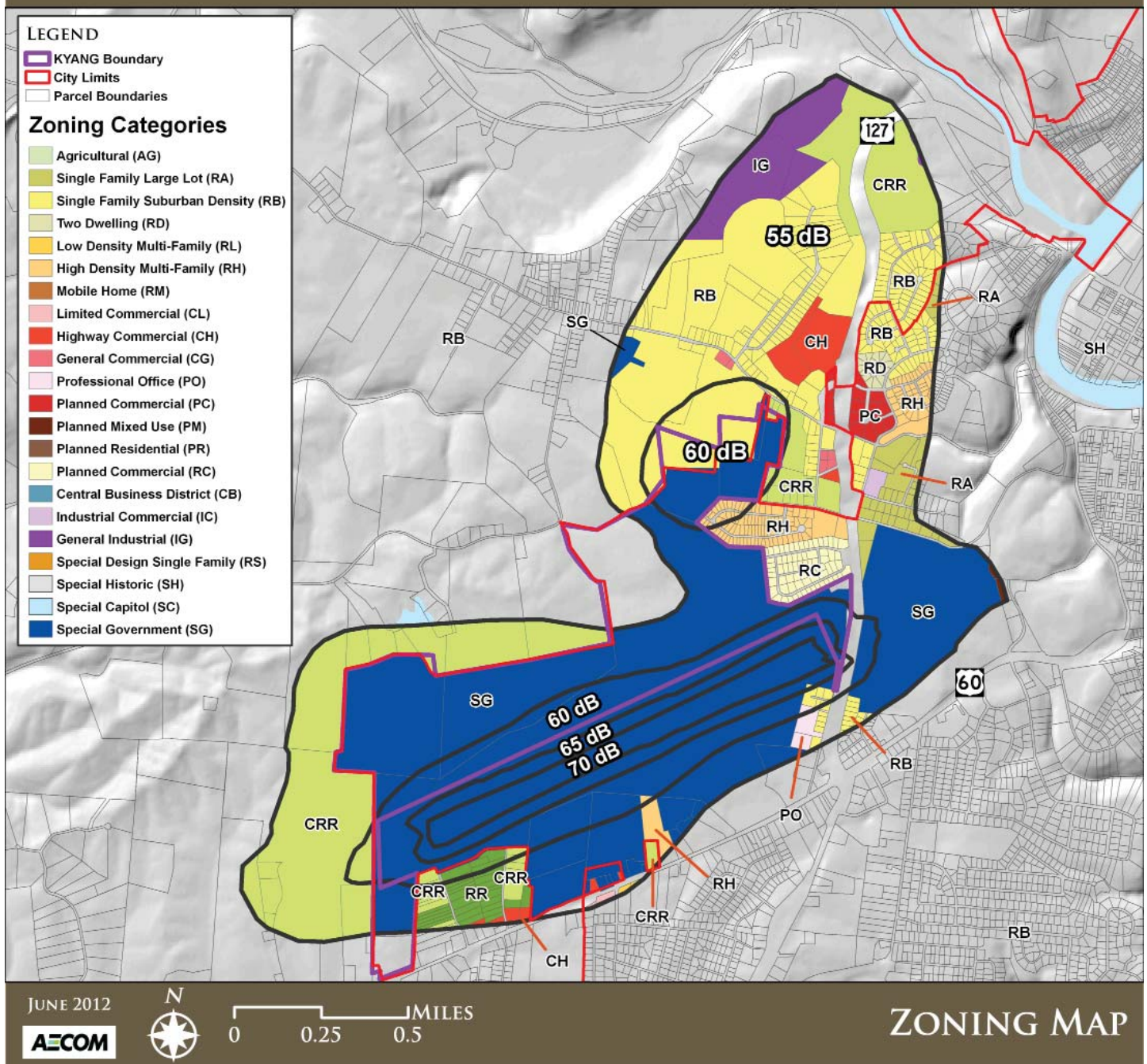


Figure 8. Zoning and Noise Contour Map



Overall current land use compatibilities around Boone Center and Capital City Airport are relatively limited. Higher levels of noise exposure likely to trigger the most severe conflicts with sensitive uses are confined primarily to state owned airport property. Some 55 to 60 dBA impacts, however, affect adjoining residential neighborhoods just south of the airport. Additionally, most of the property in the critical approach and departure zone, the RPZ, is publically owned or has few existing structures.

## Future Land Use

Including the Salato Wildlife Center and Game Farm to the west and the Juniper Hills Golf Course/Juniper Hills Municipal Park to the east, Boone Center is bordered by over 200 acres of protected, low-intensity land uses, which are unlikely to change in the foreseeable future (see Table 5). However, the remaining adjacent residential and commercial parcels are vulnerable to noise and risk exposure and can potentially threaten the training activities of Boone Center.

Based on existing zoning maps, the Future Land Use Map, and the Comprehensive Plan Update, future development and growth will likely continue to occur in areas to the south and east of Boone Center—intensifying with infill development. The land uses primarily remain consistent with their existing land use designations; however, the stated goals and policies of

Comprehensive Plan Update seek to preserve existing farm and rural lands and direct new development into target growth areas already served by necessary infrastructure, including mixed uses and moderate and high density residential developments.

## Areas of Concern

Based on previous studies, analysis and stakeholder feedback, the planning team identified the following specific areas of concern around Boone Center and Capitol City Airport. The recommendations for increased communication and growth management focus on reducing conflicts in these areas.

*South Frankfort* – According to feedback from residents and stakeholders, this urban area to the east of the runway centerline experiences ongoing noise exposure from current aviation operations.

*Pebblebrook Way* – This area directly north of Boone Center includes Westridge Elementary School, the largely unconstructed 98-unit Pebble Brook subdivision, and an additional preliminary plat for a 40-unit residential development. Proximity to the current AASF helipad places this area within the 55 dB noise contour. Though 55 dB is generally considered compatible with housing, a revival of

Table 5. Future Land Use Acres within dB Range

Land Use	Acres within dB Range	
	55 dB	60 dB
Suburban Residential	558	80
Hamlet	42	3
Public/Semi-public	309	178
Parks/Recreation	77	7
Suburban Business Center	86	2
Commerce Center	5	-
Conservation/Transitional Residential	2	-
Subtotal	1,079	270
		Total = 1,349

Source: Frankfort/Franklin County Comprehensive Plan



residential construction as market conditions improve would increase the number of residents exposed to noise and potential disturbance. The relocation of the AASF to the south will, however, reduce noise levels on land north of Boone Center.

*Highway 60 West* – This area to the west of Boone Center/Capital City Airport includes the Salato Wildlife Center; Hunters Trace residential subdivision; the Armstrong Crossing residential subdivision; and an additional property adjacent to Salato that has been the subject of previous rezoning interest.

*Hawkeegan Drive* - This area directly to the south of Boone Center has the closest adjacency to the airport runway and experiences noise exposure at an average daily level of 60 dB, approaching the threshold for residential incompatibility.



## Section 9

# COMPATIBILITY STRATEGIES

### Introduction

Based on feedback received from the JLUS Committee and public, this document establishes a set of short-, mid-, and long-term actions to promote land use compatibility and strengthen coordination around Boone Center and the airport.

As noted earlier, Franklin County, the City of Frankfort, Boone Center and Capital City Airport have adopted some compatibility practices to protect essential aviation and training activities. A review of current local government measures, however, indicates gaps in the approach to compatibility reduction, both in the form of geographic areas that remain unregulated and in existing policies that require additional regulatory provisions or communication procedures. The recommendations and Implementation Plan are intended to strengthen critical policy challenges and enhance the capacity of the city, county, and other stakeholders to promote compatible land use in the study area.

The following sections organize these recommendations in three ways:

By Type of Tool – the Compatibility Options section describes general compatibility approaches to address critical issues raised during the JLUS process.

By Geography – the Planning Areas section identifies Airport Overlay District zones around Boone Center and Capital City Airport in which the JLUS recommends land use regulation and/or communication procedures.

By Implementation – The Implementation Plan identifies the most feasible and critical short-term measures to reduce encroachment risk, as well as mid- and long-term strategic efforts.

### Compatibility Options

The compatibility strategies described in this section address a variety of possible land use and operational issues around Boone Center and Capital City Airport, including physical adjacency to the airport and National Guard Center, aviation-related noise, aviation safety, and issues such as outdoor lighting, wildlife attractants and height obstructions.

The descriptions below include strategies that may not yet be fully feasible in the study area, but have value as long-term approaches to minimizing incompatible development around Boone Center and the airport. In other cases, the city and county have partially adopted available strategies and the options can focus on enhancing these current measures. As development conditions and mission impacts evolve, the JLUS encourages local officials and planners to revisit this list of strategies to further refine and strengthen their set of compatibility tools.

### Bird Aircraft Strike Hazard

Aircraft collisions with birds and other wildlife can cause millions of dollars in aircraft damage and may result in loss of aircraft and aircrews. Human-made or natural areas, such as poorly-drained land, retention ponds, roosting habitats on buildings, landscaping, putrescible-waste disposal operations, wastewater treatment plants, agricultural or aquacultural activities, or wetlands can attract birds and wildlife to aviation areas.

Local governments can reduce risks by adopting standards for the siting and design of facilities, such as stormwater infrastructure or landfills, in the vicinity of an airfield, particularly near the runway approach and departure zones. The Federal Aviation Administration, for example, recommends that retention basins be designed with steep sides, narrow water bodies, and riprap lining to reduce use by birds. Such facilities would also be placed away from aircraft movement areas to minimize collision hazards. As part of this medium term strategy, the city and county would incorporate these standards as part of zoning and regular subdivision review processes. Utility providers should also emphasize compliance with BASH practices in the construction and design of any proposed storm water infrastructure.

### Comprehensive Plan

Comprehensive Plans can guide development patterns around a military installation by establishing compatible future land uses and designating areas suitable for growth. These policies



establish a firm legal basis for the implementation of encroachment reduction actions and set the framework to manage growth through local land use regulations. An increasingly popular strategy is for local governments to develop a Military Influence Planning District (MIPD) Element within the Comprehensive Plan. This element is devoted exclusively to the collaborative relationship between the local government and military installation and integrates all policies that may promote compatible development, including communication procedures, conservation, and land use, transportation and infrastructure policy.

Under this high priority, short-term option, the city and county would enhance language in the current Frankfort/Franklin County Comprehensive Plan as part of its next update. Plan language should contain guidance on military compatibility, including the Airport Overlay District and major JLUS recommendations for communication, consultation, infrastructure planning coordination and use of conservation subdivision design (see Technical Appendix for specific language).

## Conservation

Conservation refers to a series of tools designed to eliminate land use incompatibilities through voluntary transactions in the real estate market and local development process. These strategies are particularly effective because they advance the complementary goals of shifting future growth away from military impacts, while protecting the environment and wildlife habitat, maintaining agriculture, and conserving open spaces and rural character.

The core implementation strategy of the conservation approach is to acquire easements that prohibit incompatible development in perpetuity, while allowing the land to remain in private hands. While the restrictive covenant prohibits more intensive development, it accommodates low impact uses such as farming or passive recreation that do not pose a risk of interference with nearby training activities. Landowners receive fair-market compensation and/or tax credits for the loss of the development rights associated with the affected property.

The Army Compatible Use Buffer (ACUB) grants the military the ability to enter into agreements with eligible entities, including local governments, non-governmental organizations, such as land trusts, and willing land owners to secure conservation easements on property in the vicinity of, or ecologically related to, a military installation or military airspace.

The DoD has also formed a partnership with the United States Department of Agriculture (USDA) to conserve sensitive lands near military bases around the nation. Through the USDA, military planners can now access the resources of existing easement programs, such as the Farm and Ranch Lands Protection Program, the Wetlands Reserve Program, and the Grassland Reserve Program.

As noted earlier, the State of Kentucky established the Purchase of Agricultural Conservation Easement Corporation, authorizing the state to purchase agricultural conservation easements to preserve agricultural land and ensure such lands are not converted to other uses. In addition to the purchasing program, landowners are also encouraged to donate easements dedicating their land to agricultural uses in exchange for state and federal tax incentives.

The status of Boone Center and the Capital City Airport as state-owned properties, rather than federal land, effectively limits their eligibility to participate in the DoD-funded ACUB program. Conservation easement purchases, particularly as administered through the PACE program, however, remain a viable option for preserving open space in rural areas west of the National Guard Center and airport. Though a longer-term tool, the county should continue to explore partnerships with the KDFWR and Kentucky Department for Natural Resources, Division of Conservation to identify possible opportunities for agricultural easement purchases or the development of low impact recreational uses on additional property adjoining the Salato Wildlife Center.

## Conservation Subdivision Design Ordinance

Conservation subdivision design can assist in promoting land use compatibility around a military installation by shifting permitted development away from impacts, such as noise or safety risks, generated by nearby training activities. This alternative layout allows developers to condense lot sizes, placing houses on the most buildable portion of the site and dedicating open space on the remainder of the parcel. The innovative, flexible design of such planned communities enables developers to maximize the number of residential lots, while creating common space and landscape amenities that enhance market appeal. The preserved open space also effectively results in a natural buffer to mitigate operational impacts.



Conservation subdivision design strongly complements the predominantly rural landscape that surrounds Boone Center to the west. The county has already established a conservation subdivision option for lands in its Rural Residential category. This high priority, short-term action would expand the applicability of this tool to all properties within the Airport Overlay District. The Comprehensive Plan should further reinforce this link by adding language that references the preferred use of flexible, alternative residential designs in areas near Boone Center and the airport.

## Controlled Airspace Information

Airfields feature a series of imaginary spaces above the runways that must be free of vertical, visual or electrical interference to enable safe use of landing and departing aircraft. The most common hazards stem from either man-made or natural features, such as buildings, telecommunications towers or trees that are tall enough to penetrate the airspace. The controlled airspaces are sloped, meaning that limitations on height become more restrictive closer to the runway when aircraft are at their lowest altitude. With distance from the runway, the heights can increase without causing physical interference. Other hazards include uses that could impair pilot vision by generating light glare, steam, or dust or confuse pilot orientation by producing lighting similar to airfield navigational signals.

The Federal Aviation Administration controls the airspaces around airports in its Part 77 standards for objects affecting airspace. State law also grants the Kentucky Airport Zoning Commission jurisdiction over the zoning, land use, structures, and airspace of all military airports and public-use airports. The intent of this high priority, near-term action is to ensure that the controlled airspace around Capital city Airport is mapped and that existing FAA guidance and State of Kentucky Airport Commission zoning laws regulating aviation obstructions are incorporated into local land use policy and regular development review processes.

## Formal Note

A standard note attached to key property and development documents highlights the potential for compatibility issues on land in the vicinity of Boone Center and Capital City Airport. As part of the medium priority strategy, the city and county would record a note on plats, titles, and permit applications indicating the presence of the referenced parcel within the Airport Overlay

District (AOD). The note serves as trigger for additional research by the property owner into any specific land use conditions associated with AOD provisions and also ensures that compatibility considerations become part of routine government and utility development review and application procedures.

## General Outreach Materials and Community Briefings

General communication activities should focus on raising awareness of military and airport activities, as well as operational issues such as noise and aviation safety. Community study partners should use all available media, including printed materials such as a brochure and city, county, and airport web sites to convey information on mission, economic benefits, and noise and height restrictions as part of this short-term, high priority action.

Similarly, the National Guard and airport would build on current communication with their neighbors by conducting bi-annual public informational briefings on operations and planned projects. Designation of a highly visible National Guard and airport liaison would also assist in addressing any ongoing issues related to noise, measures to protection the runway glide path, such as tree removal, and other concerns in the community. Under this medium priority action, study partners could coordinate outreach through existing community events such as the airport's annual Aviation Day or the use available local media outlets such as Cable 10.

## Infrastructure Systems Planning

The provision of infrastructure is typically based on public need and reflects the Comprehensive Plan of the city or county. As part of this strategy, local governments would consider the impacts of both public and private infrastructure installation/extension (e.g. water and sewer facilities) into noise and safety affected areas around a military installation or airport. New infrastructure, especially wastewater, can induce or support incompatible growth patterns, such as denser residential development, especially if compatible zoning and land use guidelines are not in place to guide future land use.

Since capital investment decisions in turn influence private market location decisions, it is critical that local governments link their capital improvement programs and projects to compatibility goals. Installing infrastructure such as water,



sewer, and roads in planned growth areas and away from land with operational impacts clearly reduces the conflicts associated with denser development near military activities.

Infrastructure planning should, at a minimum, establish consistent dialogue between local and military stakeholders on the potential impacts of infrastructure investment decisions. As part of this strategy, area utility providers would join as signatories in a Memorandum of Agreement that outlines notification procedures for major infrastructure projects around Boone Center and Capital City Airport. The advisory joint consultation would consider the impacts of system expansion on likely development patterns and any resulting potential conflicts with military and airport activity in the AOD as described later.

Beyond facilitating ongoing dialogue among area stakeholders, utility planning can be used as a formal growth management tool. The city and county could, for example, engage in a coordinated process of planning future growth areas as part of a joint-service growth boundary agreement that identifies a phased, contiguous and orderly trajectory for suburban development and associated utilities in unincorporated areas. Accommodating future development and public investments within an explicitly drawn planned growth boundary supports several complementary goals, including directing development pressure back toward mature neighborhoods, promoting more efficient delivery of infrastructure, and protecting rural character and environmental resources.

Land in unincorporated Franklin County west of Boone Center could be part of an Area of Mutual Planning Concern that is outside of the planned growth/urban area and is not subject to annexation in the near term. The city and county, however, would fully coordinate land use activity within this area. Such policies limit the ability of growth to “leap-frog” existing service areas. Given the complexity of these issues, the JLUS identifies formal utility planning strategies as a long-term option for effective growth management and instead emphasizes the participation of utilities in near-term MOU consultation process.

## Memorandum of Understanding

While the previous general communication procedures focus on strengthening awareness in the surrounding community, this strategy is geared toward improving the flow of information among study partners in the military and government sectors. Study partners can, for example, sign a Memorandum of Understanding (MOU), which is a “good faith” document that

establishes procedures for communication and formalizes collaboration among multiple stakeholders, including the National Guard, Capital City Airport, Franklin County, the City of Frankfort, and utility providers. The MOU would identify local land use actions within a set geographic area that are appropriate for joint consultation, list procedures for communication, and establish primary points of contact for each stakeholder group.

Under joint consultation, the city or county would notify the National Guard and airport of major development proposals that exceed specified criteria for size or density. Projects recommended for consultation include the following:

- Residential projects with a density greater than 2 dwelling units per acre
- Non-residential uses that concentrate, within a structure on a regular basis, more than 35 people per acre (sports stadiums, amphitheaters, auditoriums, clubhouses, churches, schools, hospitals, assisted living and other medical facilities, hotels and motels, restaurants and other eating and drinking establishments and strip commercial centers built to such a scale that gatherings of more than 35 people per acre would be expected on a regular basis)
- Uses that give off light, steam, dust or other impacts that could interfere with pilot vision

Military and airport representatives could then review and comment on any foreseen compatibility issues resulting from the proposed land use change. Consultation could, for example, recommend specific mitigation measures, such as noise attenuation, real estate disclosure or shielded outdoor lighting to minimize possible adverse impacts. It should be noted that any consultation granted as part of the MOU would be strictly advisory as the city and county fully retain the right to determine the use of land outside of Boone Center and the airport. The MOU process can also be used to incorporate encroachment considerations into regular local government development processes.

The county, city, National Guard and airport should implement this short-term, high priority strategy by refining the key communication procedures contained in the sample MOU and identifying primary internal points of contact to produce and receive notices (see Technical Appendix for sample MOU). To ensure continuity despite periodic personnel turnover the MOU should also specifically designate local government, airport and National Guard positions responsible for ongoing coordination. The MOU should also further specify that



compatibility analysis occur as part of routine technical team review for activities such as subdivision applications within the county.

## Noise Modeling

As noted previously, current contours depicting the noise environment around Boone Center and the airport will become obsolete with the relocation of the Army Aviation Support Facility (AASF) and resulting flight patterns.

The noise footprint is anticipated to shrink in the north due to eventual disuse of the helipad but bow outward from the eastern and western ends of the airport runway as helicopters follow the existing flight patterns of fixed-wing aircraft. Any noise mitigation strategies, such as sound attenuation practices or disclosure, should be tied to contours based on the most current mission activities.

As part of this critical, near-term action, the Kentucky Army National Guard would scope, fund, and conduct a noise modeling study to reflect all anticipated changes in helicopter operations. Helicopter noise can be inherently challenging to model relative to fixed wing aircraft due to evidence of dispersed noise and vibration impacts in areas beyond modeled contours. Any modeling updates, therefore, should explore methodologies specifically developed for helicopter activity, such as the Rotorcraft Noise Model.

## Ongoing Implementation Body

Multi-jurisdictional and multi-sector collaborations are more effective when led by a single entity. A key step in coordination is for military, government, and community study partners to form an ongoing implementation body that meets on a regularly scheduled basis to share information on mission or land use changes, monitor implementation progress, and revisit longer-term compatibility strategies as conditions warrant. The JLUS recommends that the entity's membership consist of a mix of JLUS Committee participants, representing Boone Center, Capital City Airport, private sector developers, realtors, and landowners, community and neighborhood groups, and major utility providers.

Under this high priority, short-term action, the JLUS implementation entity would function as a sub-committee to the Frankfort/Franklin County Planning Commission. The sub-committee would conduct quarterly meetings to review major

military and civilian actions, monitor compatibility conditions, facilitate community outreach, and revise and refine JLUS compatibility strategies.

## Outdoor Lighting Standards

The use of excessive and unshielded outdoor lighting can interfere with aircraft operations. Outdoor lighting systems, especially lighting associated with billboards, gas stations, major roadways, athletic fields, and large commercial or industrial uses, allow significant light to travel upward into an otherwise darkened sky. The resulting "light pollution" can obscure pilot vision.

Regulations that minimize lighting interference do not require the strict prohibition of exterior lighting or the complete replacement of existing lighting fixtures. Instead, regulations focus on installing less intrusive lighting applications either for new development or as part of the routine maintenance/replacement of public utilities.

Though a lower priority strategy due to minimal current lighting compatibility issues, the city and county can assist in minimizing future light pollution conflicts by add notes to plats, development plans, and permit applications within 1,500-feet of the airport runway that encourage the use of directional lighting or shielded lighting fixtures for major outdoor applications such as:

- parking lots
- roadways
- commercial and industrial building exteriors

See Technical Appendix for outdoor lighting standards.

## Real Estate Disclosure

Real estate disclosure involves the release of information on possible impacts (noise/vibration or air safety zones) as part of market transactions for properties close to military or airport operations. The intent of this communication strategy is to ensure that prospective buyers or renters understand the relationship between installation proximity and impacts and to promote fully informed decisions about property investments. Disclosure commonly occurs for other physical conditions that could affect property use, such as presence in a floodplain.

Real estate disclosure can be mandatory when adopted by state law or local ordinance or voluntarily implemented through



the participation of real estate professionals. Given the challenge of enforcing implementation, the JLUS identifies this strategy as a low priority action and recommends that disclosure be administered through the Property Valuation Administrator (see Technical Appendix for sample disclosure form and language). As described later, the focus of disclosure should be on those properties with noise exposed areas (60 dBA or higher) or within established air safety zones.

## Searchable Database

To ensure additional access to information for land owners, developers, and prospective renters or buyers, the JLUS also recommends creation of a searchable database for properties in affected areas. This web-based tool would enable users to search various property characteristics based on physical address or property tax information. Results can then confirm the presence of properties within the AOD and highlight any associated development conditions, such as height or density restrictions or required disclosure or sound attenuation. The JLUS identifies this tool as a medium priority strategy of particular value for Franklin County because it conveniently consolidates multiple data sets for zoning, land use, utilities, environmental features etc... and links them to available mapping.

## Small Area Plan

Detailed small area plans can assist in promoting compatibility around military installations by establishing a more specific land use vision and development framework for an affected area in advance of emerging development activity. The area west of Boone Center in unincorporated Franklin County continues to show development interest and is likely to absorb future residential growth as market conditions improve. This area could also be subject to additional growth pressures resulting from any future roadway widening or other capacity improvements along Highway 60. Unplanned growth in this area, particularly in closer proximity to the western end of the Capital City Airport runway could trigger compatibility issues.

To accommodate desired growth in a compatible pattern, the JLUS recommends a medium priority effort to conduct a small area plan for that portion of the county roughly bounded by Bridgeport-Benson Road on west, Pea Ridge Road on north, Highway 127 to east and Boone center to south. The study would establish a long-term vision for the area, including the

desired character of the area, land uses and densities, open space protection, infrastructure capacity and transportation access.

## Sound Attenuation

Attenuation refers to special design and construction practices intended to lower the amount of noise and vibration that penetrates the windows, doors, and walls of a building. Local governments can require attenuation as part of building code enforcement for new residential and other noise sensitive construction in certain noise-affected areas (typically in excess of 60 dBA around Boone Center and Capital City). Attenuation practices are recommended only for the construction of new noise sensitive uses, such as houses, schools, medical facilities or gathering places. Complete sound attenuation guidelines are available in the latest advisory document on: Guidelines for Sound Insulation of Residences Exposed to Aircraft Operations, 2005. Sound attenuation practices also serve the complementary goal of promoting greater energy efficiency.

## Transportation Planning and Gate Access

Stakeholders have noted several challenges in accessing the main gate to Boone Center off of Highway 127, including poor sight distance and the lack of depth in the turning lane on the north bound portion of the roadway and the absence of a dedicated right turn lane in the south bound right-of-way. These conditions result in safety issue for drivers turning left onto the installation and general vehicle queuing during peak hours.

To facilitate safer and more efficient access to the main gate of Boone Center, the JLUS recommends a medium-term strategy to fund, scope and conduct a more detailed analysis that explores transportation improvements to Highway 127, including a review of the feasibility to:

- Extend the turn lane and add a designated right turn lane on south bound Highway 127
- Extend the turn lane on north bound Highway 127
- Implement signal timing at the intersection



## Planning Areas

Members of the planning team and JLUS Committee identified a series of overlapping geographic areas around Boone Center and the airport that warrant special coordination procedures or land use regulation due to their proximity to aviation or training activities. Each of the planning areas is exposed to one or more operational impacts related to the military mission, such as noise or vibration, the risk of an aircraft accident, or height restrictions. These boundaries reflect both the results of computer modeling to identify specific areas of impact or broader Areas of Concern intended to capture those areas that are likeliest to be affected by training activities. When combined, these planning areas serve as the spatial framework for compatible land use planning around Boone Center and Capital City Airport as shown in Figure 9. These areas also form the geographic basis for a Airport Overlay District (AOD). Figure 10 also illustrates the Airport Overlay District planning areas but also shows the conceptual future noise zones, which correspond to the new AASF location. These conceptual future noise zones will be updated upon the completion of new noise modeling analysis at a future date.

The AOD combines many of the individual land use or communication strategies described in the previous section into a single, integrated regulatory ordinance that can be adopted by the city and county. In most cases, the overlay does not alter underlying land uses but places additional communication, consultation or performance related standards such as outdoor lighting or sound attenuation on properties in specific areas. Overall, the AOD consists of six zones. The broadest zone, the Planning Influence Area, is designated solely for communication and consultation purposes. More specific regulatory provisions such as density restrictions or land use prohibitions are reserved for a narrow set of zones in close proximity to the airport runway or Boone Center perimeter.

**Subarea 1:** Planning Influence Area – encompasses key portions

of the controlled airspace (FAR Part 77) around the airport and is aligned with the Suburban Area boundary from the Franklin County Comprehensive Plan; this area sets the basis for consultation among the city, county, Boone Center and the airport for specific plat and development plans

**Subarea 2:** Runway Protection Zone (RPZ) – the areas immediately off of the ends of the runway, which are subject to the highest statistical risk of an aircraft accident; the zones are the basis for recommended land use regulation prohibiting any structures

**Subarea 3:** Approach Zone 1 – areas beyond the RPZs that have a lower risk of an aircraft accident but still maintain some sensitivity to runway operations; this area forms the basis for recommendations limiting land uses that concentrate people,, wildlife attractants, visual obstructions, tall structures, noise sensitive developments, and storage of hazardous and flammable materials

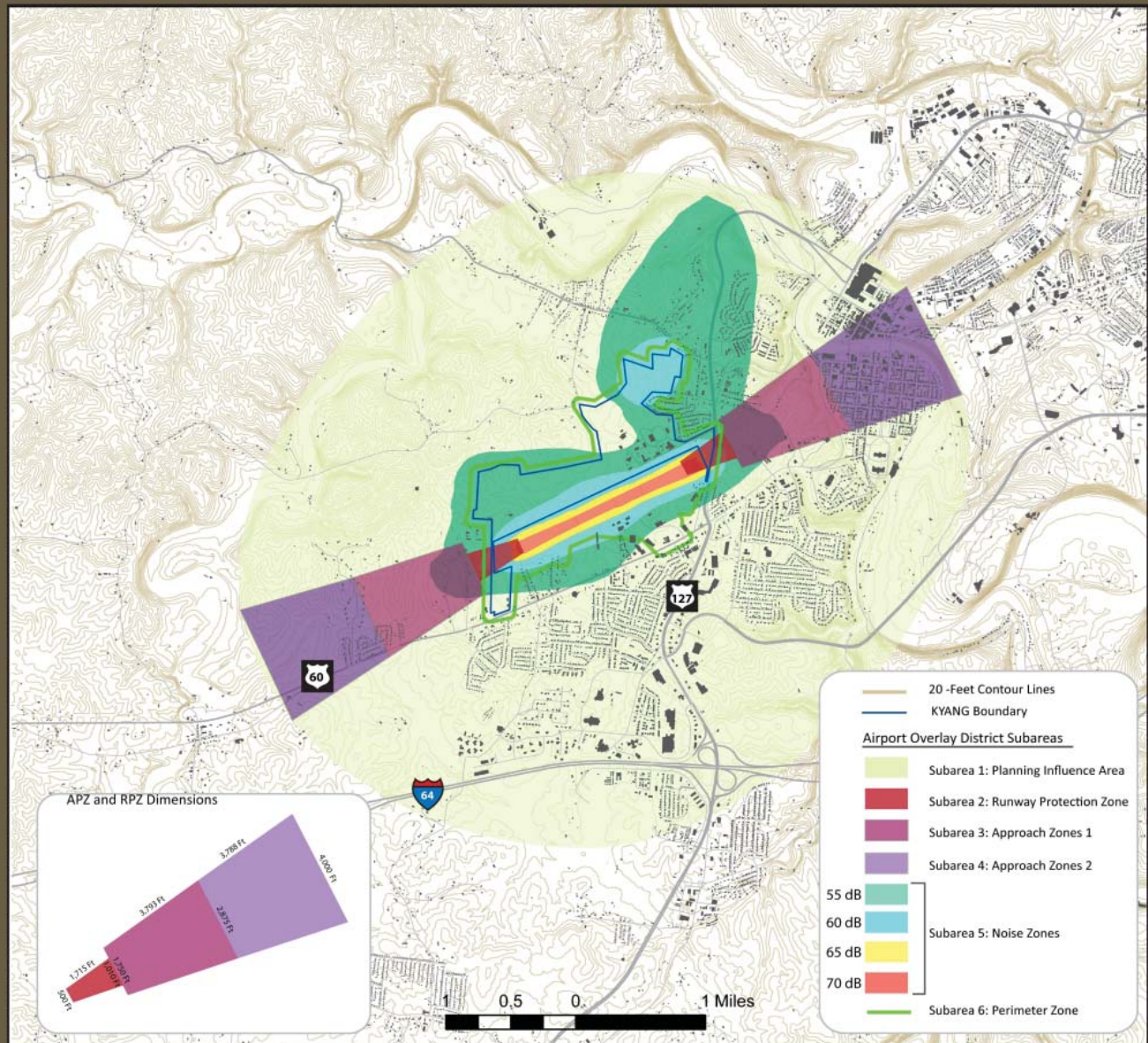
**Subarea 4:** Approach Zone 2 – areas beyond Approach Zone 2 that would trigger coordination, communication and disclosure strategies

**Subarea 5:** Noise Zones - areas of higher than average noise based on the most current technical modeling that considers the type and frequency of nearby aircraft activity; recommendations for these areas focus on communication and disclosure strategies, as well as noise attenuation practices for the construction of certain sound-sensitive uses

**Subarea 6:** Perimeter Zone – a 200-foot buffer around the airport and Boone Center property in which taller structures or denser land uses are discouraged to maintain perimeter security for personnel



## BOONE ANG/FRANKLIN COUNTY/CITY OF FRANKFORT JOINT LAND USE STUDY



FEB 2013

AECOM

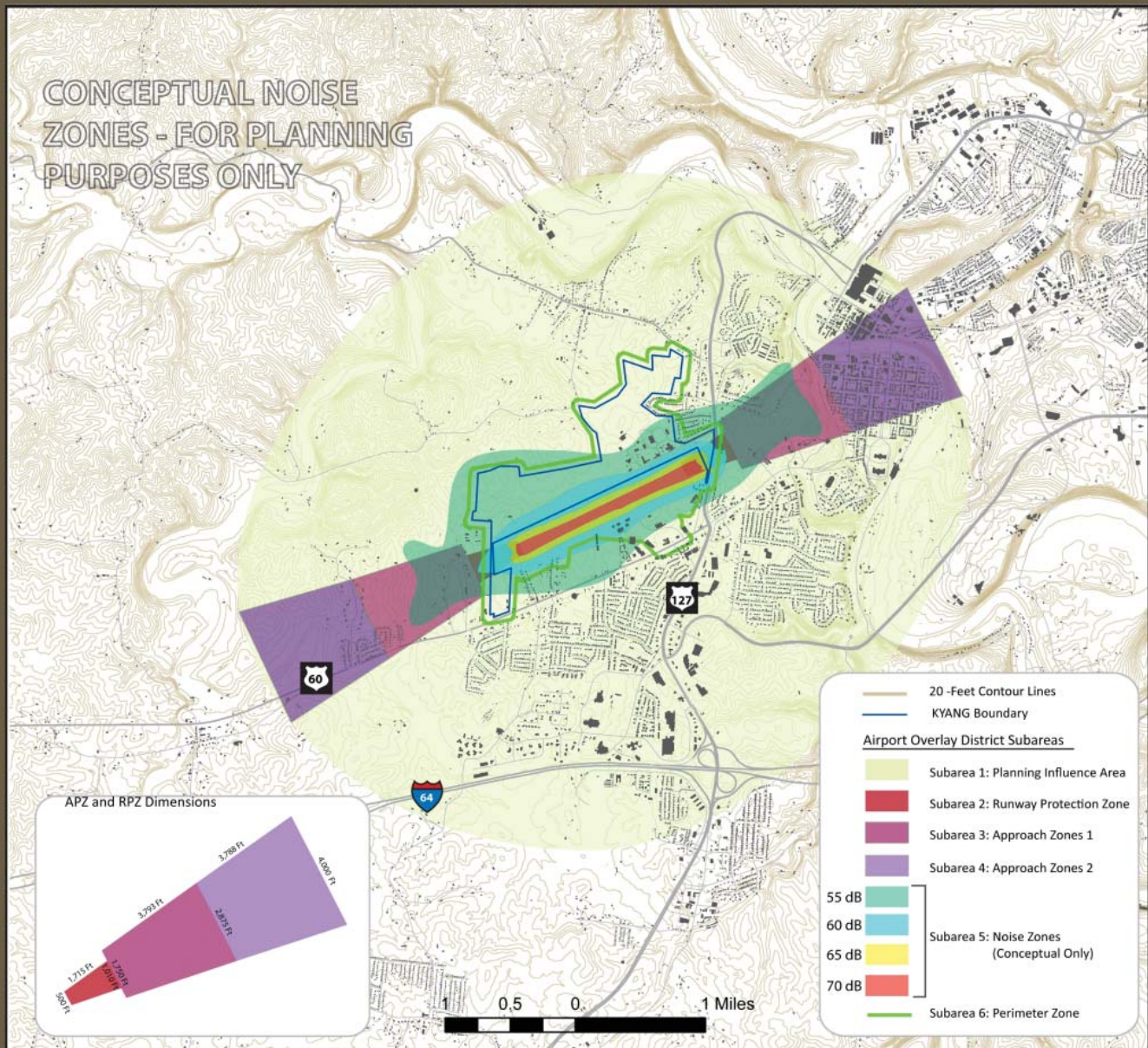


## AIRPORT OVERLAY DISTRICT

Figure 9. Airport Overlay District



## BOONE ANG/FRANKLIN COUNTY/CITY OF FRANKFORT JOINT LAND USE STUDY



FEB 2013

AECOM



## AIRPORT OVERLAY DISTRICT &amp; CONCEPTUAL FUTURE NOISE ZONES

Figure 10. Airport Overlay District Showing Conceptual Future Noise Zones



Table 6 summarizes recommendations by area and indicates current policies or any additional local regulatory actions that are necessary to protect the safety of people and property affected area. Table 7 summarizes all recommendations by

short-, mid- and long-term and indicates implementation actions, partnerships and order of magnitude cost.

Table 6. Planning Areas

ZONE	BASIS	LAND USE	COORDINATION/ COMMUNICATION
Subarea 1: Planning Influence Area	<ul style="list-style-type: none"> <li>• Key portions of the controlled airspace (FAR Part 77) around the airport</li> <li>• Aligned with the Suburban Area boundary from the Franklin County Comprehensive Plan</li> <li>• Intended mostly as boundary for partner consultation and communication</li> </ul>	<ul style="list-style-type: none"> <li>• No land use regulations proposed</li> <li>• All height restrictions consistent with Part 77 airspace regulations</li> </ul>	<ul style="list-style-type: none"> <li>• Requires consultation with Boone Center and airport for residential projects with a density greater than 2 dwelling units per acre; uses that would typically concentrate more than 35 people at any one time (schools, medical facilities, churches) ; uses that give off light or other impacts that could interfere with pilot vision</li> <li>• Record note on plats, titles, and permit applications indicating the presence of the referenced parcel within the Airport Overlay District (AOD)</li> <li>• Application of BASH standards</li> <li>• Property in AOD depicted on a publically available map</li> </ul>
Subarea 2: Runway Protection Zone (RPZ)	<ul style="list-style-type: none"> <li>• FAA guidance</li> <li>• Protect people and property in areas immediately off of runway</li> </ul>	<ul style="list-style-type: none"> <li>• No residential, commercial or industrial structures permitted (the equivalent of the military Clear Zone)</li> </ul>	<ul style="list-style-type: none"> <li>• Full coordination and communication procedures as indicated above</li> <li>• Note on development documents to encourage use of shielded or directional outdoor lighting</li> <li>• Application of BASH standards</li> <li>• Real estate disclosure</li> </ul>



Table 6. Planning Areas

ZONE	BASIS	LAND USE	COORDINATION/ COMMUNICATION
Subarea 3: Approach Zone 1	<ul style="list-style-type: none"> <li>• FAA guidance</li> <li>• Protect people and property in approach and departure areas off of runway</li> <li>• Intended to limit more intense uses or uses that could pose a specific risk to aviation activity</li> </ul>	<ul style="list-style-type: none"> <li>• Cap single family residential density with minimum lot size of 1.5 acres</li> <li>• Set maximum, aggregate footprint for all commercial buildings, including office, business, retail and wholesale trade set at 15,000 square feet</li> <li>• Set maximum gross acreage coverage for all industrial buildings is 40%, and such uses would have no more than 35 employees per shift</li> <li>• No manufacturing or above- or below-ground bulk storage of flammable liquids, gases, or other explosive or hazardous materials</li> <li>• No use emitting smoke, steam, dust, gases or projectiles</li> </ul>	<ul style="list-style-type: none"> <li>• Full coordination and communication procedures as indicated above</li> <li>• Application of BASH standards</li> <li>• Real estate disclosure</li> </ul>
Subarea 4: Approach Zone 2	<ul style="list-style-type: none"> <li>• FAA guidance</li> </ul>	<ul style="list-style-type: none"> <li>• No specific land use restrictions or prohibitions</li> </ul>	<ul style="list-style-type: none"> <li>• Full coordination and communication procedures as indicated above</li> <li>• Real estate disclosure</li> </ul>
Subarea 5: Noise Zones	<ul style="list-style-type: none"> <li>• Technical modeling</li> <li>• Update to noise contours recommended</li> </ul>	<ul style="list-style-type: none"> <li>• No residential density restrictions</li> </ul>	<ul style="list-style-type: none"> <li>• Full coordination and communication procedures as indicated above</li> <li>• Real estate disclosure</li> <li>• Conditional permitting process for noise sensitive uses such as schools, hospitals etc... within 60 decibels</li> <li>• Noise attenuation for new noise sensitive construction only on properties exposed to noise in excess of 60 decibels</li> </ul>
Subarea 6: Perimeter Zone	<ul style="list-style-type: none"> <li>• 200 foot buffer</li> <li>• Potential security vulnerability for military personnel on the installation and some noise exposure from activities at National Guard Center</li> <li>• National Guard to assess internal activity around the perimeter</li> </ul>	<ul style="list-style-type: none"> <li>• Minimum residential lot size of 1.5 acres</li> <li>• 35-foot maximum building height</li> </ul>	<ul style="list-style-type: none"> <li>• Full coordination and communication procedures as indicated above</li> <li>• Real estate disclosure</li> </ul>



**Table 7 - BOONE CENTER JLUS COMPATIBILITY STRATEGIES**

Strategy/Tool	Description	Area Used	Actions	Priority	Timeframe	Partners	Order of Magnitude Cost
<b>Comprehensive Plan Update</b>							
Expand upon Boone Center/airport section in existing comp plan or in next Frankfort/Franklin County Comp Plan update	Plan references compatibility with Boone Center and Capital City Airport, but should also include recommendations and strategies resulting from JLUS	Includes all of city and county but plan update should contain policy and geographic references to established Airport Overlay District	Revisions to existing comp plan and/or update	High	Short-term	FC, CoF	\$
<b>Update Noise Modeling</b>							
Conduct additional noise modeling based on the new Army Aviation Support Facility (AASF) location	Update noise modeling for relocated AASF operations	Areas of sensitivity include zones in excess of 60 decibels	<ul style="list-style-type: none"> <li>• Scope, fund and conduct study for new noise contours</li> <li>• Explore use of model specifically developed for helicopter noise such as Rotorcraft Noise Model (RNM)</li> <li>• Enhance qualitative description of noise issues in environment to supplement technical modeling</li> <li>• Ensure that any</li> </ul>	High	Short-term	BC	\$\$



			land use regulation is tied to most current noise contours				
<b>Airport Overlay District</b>							
Adopt Airport Overlay District (AOD)	<ul style="list-style-type: none"> <li>AOD would contain specific land use, communication, and performance-based standards</li> <li>Standards correspond with geographic areas identified in FAA Part 77 airspace and Kentucky Administrative Regulations, Title 602, Chapter 50 Airport Zoning Commission standards</li> </ul>	<ul style="list-style-type: none"> <li>Airport Overlay District to include critical Part 77 airspaces, Runway Protection Zone, Approach Zones 1 and 2, noise contours and perimeter buffer around Boone Center and airport</li> <li>Other provisions identified as mid-term such as noise attenuation can be added to the AOD</li> </ul>	Adoption by city and county of overlay district	High	<b>Short-term</b>	<b>FC, CoF</b>	<b>\$</b>
<b>Conservation Subdivision Design</b>							
Conservation Subdivision Design Ordinance	<ul style="list-style-type: none"> <li>Establishes by-right access to alternative subdivision layout that condenses lot sizes on most buildable portion of site and requires dedicated open space on remainder of parcel</li> </ul>	<ul style="list-style-type: none"> <li>Properties in Airport Overlay District, especially west of Boone Center</li> </ul>	County to expand applicability of conservation design ordinance beyond Rural Residential category to include land in AOD	High	<b>Short-term</b>	<b>FC</b>	<b>\$</b>



	<ul style="list-style-type: none"> <li>Uses buffers in the form of preserved open space as part of development and creates natural mitigation of noise and other military related impacts</li> </ul>						
<b>Modifications to Flight Corridors</b>							
Modify flight corridors to reflect relocated AASF	Existing "Fly Neighborly" program establishes noise avoidance areas and minimum flight elevations around known noise-sensitive areas in city and county	Known noise-sensitive areas in city and county	National Guard to revisit primary flight corridors particularly below 1,500 feet to determine if any feasible modifications exist that reduce residential exposure but maintain training effectiveness	High	<b>Short-term</b>	<b>BC</b>	<b>\$</b>
<b>Height Restrictions</b>							
Provide controlled airspace information and associated height restrictions	Federal Regulation 49 CFR Part 77 establishes standards for determining obstructions in navigable airspace and Kentucky Administrative Regulations, Title 602, Chapter 50 Airport Zoning Commission standards that apply to existing and proposed man-made objects, objects of natural growth, and terrain	FAA designated imaginary airspaces around airfield	Incorporate airspace restriction standards into current ordinances and review processes	High	<b>Short-term</b>	<b>CCA, FC, CoF</b>	<b>\$</b>
<b>Outreach Materials</b>							
Develop educational outreach materials for the community	Use of web sites, brochures, briefings, and other media to increase awareness of Boone Center and Capital City	Full study area and throughout city and county	Participation by Boone Center, Capital City Airport, city, and county officials	High	<b>Short-term</b>	<b>FC, CoF, CCA, BC</b>	<b>\$</b>



	Airport activities, mission and economic impacts						
<b>Memorandum of Understanding</b>							
Develop a Memorandum of Understanding for joint consultation procedures	<ul style="list-style-type: none"> <li>An MOU would formalize and expand the procedures regarding notification of Boone Center and Capital City Airport regarding development proposals in areas near training activity</li> <li>MOU can contain additional provisions, such as sensitive lighting applications or information sharing</li> </ul>	<ul style="list-style-type: none"> <li>Consultation should occur at a minimum inside designated sub-area safety zones and buffers but typically extends beyond to include a broader area of influence</li> </ul>	<ul style="list-style-type: none"> <li>Determine applicable area</li> <li>Items to be reviewed by Boone Center and Capital City Airport</li> <li>Develop MOU</li> <li>Participants likely to include Franklin County, Capital City Airport, City of Frankfort, Boone Center, and utilities</li> </ul>	High	Short-term	FC, CoF, CCA, BC, UP	\$
<b>Ongoing Implementation Entity</b>							
Establish an ongoing implementation entity	Create an implementation body to advocate for adoption of recommended compatibility measures and promote continued dialogue over Boone Center and Capital City Airport issues	Not geographically specific	<ul style="list-style-type: none"> <li>Explore links to existing entities to create a more regional, streamlined approach</li> <li>Designate representatives</li> </ul>	High	Short-term	FC, CoF, CCA, BC, UP	\$
<b>Searchable Database</b>							
Develop a searchable database to assist	Web based tool can assist property owners in identifying if land is in a	Full study area and throughout city and county	Best developed and operated at a regional	Medium	Mid-term	FC, CoF	\$\$



property owners	zone or district affected by military operations and determine associated development restrictions		level				
<b>Community Outreach Briefings</b>							
Conduct additional community outreach on National Guard and airport operations	<ul style="list-style-type: none"> <li>Bi-annual community briefing on training, issues, and issues</li> <li>Can include airport activities</li> </ul>	Especially relevant for neighborhoods affected by noise impacts	Designate National Guard and airport representatives	Medium	Mid-term	<b>BC, CCA</b>	<b>\$</b>
<b>Planned Growth Management</b>							
Use of capital improvement and infrastructure systems planning to guide growth	Since infrastructure (especially sewer and roads) tends to attract growth and enable denser land use patterns, limitations on the extension of public service systems in areas of sensitivity can curb future development activity	Currently undeveloped, agricultural lands to the north and west of the airfield	<ul style="list-style-type: none"> <li>Requires joint-service growth boundary agreement that identifies a phased, contiguous and orderly trajectory for suburban development and associated utilities and could specifically discourage growth in areas sensitive to military impacts</li> </ul>	Medium	Mid-term	FC, CoF, UP	\$
<b>Formal Note</b>							
Record a formal note indicating proximity to a military installation	<ul style="list-style-type: none"> <li>Require the recording of a note regarding presence in any designated air safety or training sub-area of the on a title to real</li> </ul>	All properties inside the Airport Overlay District	Recording would become part of routine government and utility development review and application procedures	Medium	Mid-term	FC, CoF	\$



	property as part of any discretionary development permit or approval						
<b>Sound Attenuation</b>							
Develop sound attenuation building standards	<ul style="list-style-type: none"> <li>Special building design and construction practices that reduce the level of noise that penetrates the habitable indoor space</li> </ul>	Areas of sensitivity include noise zones of 60 decibels or higher	<ul style="list-style-type: none"> <li>Develop noise attenuation building standards</li> <li>Incorporate noise attenuation as part of zoning</li> <li>Firmly establish noise affected areas</li> </ul>	Medium	Mid-term	FC, CoF	\$
<b>Bird Air Strike Hazards</b>							
Bird Aircraft Strike Hazard (BASH)	<ul style="list-style-type: none"> <li>Develop standards to minimize the attraction of birds near the airfield environs</li> <li>Typically includes standards for detention pond design and limiting the location of sanitary landfills</li> </ul>	<ul style="list-style-type: none"> <li>RPZ and approach zones around the airfield</li> <li>Could also be implemented in a broader influence area</li> </ul>	Incorporate BASH standards into current ordinances and review processes	Medium	Mid-term	CCA, FC, CoF, UP	\$
<b>Small Area Plan</b>							
Conduct more detailed plan for Highway 60 corridor and area to the north and west of the airfield	Establishes a more specific land use vision and development framework for the area in advance of emerging development activity	<ul style="list-style-type: none"> <li>Highway 60 corridor from Highway 127 west to Bridgeport-Benson Road</li> </ul>	Scope, fund and conduct study	Medium	Mid-term	FC	\$\$



		<ul style="list-style-type: none"> <li>Area of county roughly bounded by Bridgeport-Benson Road on west, Pea Ridge Road on north, Highway 127 to east and Boone center to south</li> </ul>					
<b>Transportation Improvements</b>							
Conduct more detailed analysis to identify transportation improvements to facilitate safer and more efficient ingress into main gate off of Highway 127	Identifies and prioritizes transportation projects to improve vehicular flow and turning movements at main gate intersection	<ul style="list-style-type: none"> <li>Extend turn lane and add a designated right turn lane on south bound Highway 127</li> <li>Extend turn lane on north bound Highway 127</li> <li>Implement signal timing at intersection</li> </ul>	Scope, fund and conduct study	Medium	Mid-term	FC, CoF, KYTC	\$\$
<b>Conservation Easements</b>							
Pursue conservation partnering opportunities through Readiness and Environmental Protection Initiative (REPI)/Army Compatible Use Buffer (ACUB)	<ul style="list-style-type: none"> <li>ACUB enables the military to enter into agreements with non-federal entities and land owners to secure conservation easements on property near a military installation or military airspace</li> <li>Land must demonstrate environmental sensitivity</li> <li>Also includes</li> </ul>	<ul style="list-style-type: none"> <li>Any lands affected by military operations that also have natural resources or are ecologically related to high quality systems</li> <li>Most promising area would be undeveloped, agricultural lands to the west of the airfield and surrounding the Salato Wildlife Education Center</li> </ul>	<ul style="list-style-type: none"> <li>Requires application from Boone Center to the DoD for funding</li> <li>Form relationship with existing conservation entities to explore partnerships with emphasis on participation from Kentucky Department of Fish and Wildlife Resources</li> <li>Identify priority</li> </ul>	Low	Long-term	BC, KDFWR	\$\$\$



	<ul style="list-style-type: none"> <li>partnerships with USDA to preserve working lands</li> <li>Funding from DoD is competitive</li> <li>Could be combined with Purchase Of Agricultural Conservation Easements (PACE) in KY</li> </ul>		<p>areas for conservation with emphasis on areas to the west of the airfield and surrounding the Salato Wildlife Education Center as top area to conserve</p>				
<b>Real Estate Disclosure</b>							
Pursue real estate disclosure	<ul style="list-style-type: none"> <li>Involves the release of information on possible impacts (noise/vibration, air safety zones) to prospective buyers or renters as part of real estate transactions for properties close to training impacts</li> <li>Can be implemented as a mandatory or voluntary disclosure</li> </ul>	At a minimum inside RPZ, AZ 1 and AZ 2 as defined in the Airport Overlay District	<ul style="list-style-type: none"> <li>Voluntary disclosure can occur through Property Valuation Administrator Office</li> </ul>	Low	Long-term	FC, PVA	\$
<b>Outdoor Lighting</b>							
Develop and apply outdoor lighting standards	<ul style="list-style-type: none"> <li>Reduce the light pollution interference with training activities by</li> </ul>	<ul style="list-style-type: none"> <li>Within 1,500 feet of the Capital City Airport runway</li> </ul>	<ul style="list-style-type: none"> <li>Develop standards</li> <li>Incorporate as part of formal note to</li> </ul>	Low	Long-term	FC, CoF	\$



	requiring the installation of fully shielded, cut-off outdoor lighting applications <ul style="list-style-type: none"> <li>• Can be required for all new developments</li> <li>• Retrofitting can be encouraged</li> </ul>		encourage directional or shielded outdoor lighting application for major commercial or industrial uses, parking lots and roadways				
--	--	--	---	--	--	--	--

Short-term=Less than 1 year

Mid-term=1 to 3 years

Long-term=More than 3 years

FC = Franklin County

BC = Boone Center

UP = Utility Providers

KDFWR = Kentucky Dept of Fish and Wildlife Resources

CoF = City of Frankfort

CCA = Capital City Airport

PVA = Property Valuation Administrator

KYTC = Kentucky Transportation Cabinet

\$ = Less than 50K

\$\$ = 50K to 100K

\$\$\$ = More than 100K



# TECHNICAL APPENDICES



APPENDIX

MODEL AIRPORT OVERLAY DISTRICT ORDINANCE

COMPREHENSIVE PLAN UPDATE LANGUAGE

DEPARTMENT OF DEFENSE LAND USE COMPATIBILITY GUIDANCE

SAMPLE MEMORANDUM OF UNDERSTANDING

SAMPLE REAL ESTATE DISCLOSURE

CONSTRUCTION PRACTICES FOR SOUND ATTENUATION

MEMORANDUM OF AGREEMENT TO ADDRESS AIRCRAFT-WILDLIFE STRIKES



## MODEL AIRPORT OVERLAY DISTRICT ORDINANCE (Franklin County)

### SUMMARY.

A. The Airport Overlay District is intended to provide for uses and unique design requirements for lands adjacent to and within runway approach zones, restricted airspace zones and noise zones for the Boone National Guard Center and Capital City Airport.

Site design and other standards are necessary to protect navigable airspace and critical training operations and may include density limitations, height limitations, lighting limitations, and other standards necessary to ensure protection of the airspace and training areas. These environs have been identified through data provided to the county from the Kentucky Army National Guard, the Kentucky Airport Zoning Commission, and by the Joint Land Use Study conducted by the county.

The following documents are hereby adopted by reference as is fully set forth within this Ordinance:

1. Boone National Guard Center Joint Land Use Study
2. Federal Aviation Regulation Part 77 - Obstructions to Navigation
3. Kentucky Administrative Regulations, Title 602, Chapter 50 Airport Zoning Commission

(The Ordinance can incorporate other documents as appropriate including any noise modeling conducted to identify noise contours for the relocated AASF facility)

### PURPOSE

The purpose of the Airport Overlay District (AOD) is to:

1. Ensure safety to people and property within the AOD;
2. Prohibit the establishment of incompatible structures within the designated zones of the AOD; and
3. Protect the airspace, approach zones, inner horizontal zones, conical zones, outer horizontal zones, and transitional zones from the establishment of uses, structures or placement of objects that interfere with the safe operation of aircraft

### AIRPORT OVERLAY DISTRICT

- A. Description of Airport Overlay District Zoning Districts. Airport Overlay District (AOD) zoning districts include the established runway protection zone and approach zones and noise zones of the airfield at Capital City Airport and extend outward from those zones at varying distances specific to the Boone National Guard center and their uses. These zoning districts include and define areas that are close enough to the Boone National Guard Center and



Capital City Airport to affect or to be affected by the military mission and operations of the airport.

Because of the relationship of these areas to the airport, they are subject to additional restrictions on development. The regulations and densities adopted herein are based on Federal Aviation Administration guidance, Kentucky Title 602 Chapter 50 and the Joint Land Use Study.

*Planning Influence Area:* All other property which is outside of the runway approach zones, noise contours or perimeter buffer but which is close enough to the airport and Boone Center to impact or be impacted by military and aviation operations

*Runway Protection Zone (RPZ):* includes all property within the trapezoidal shape immediately off of the ends of the runway

*Approach Zone 1 (AZ 1):* includes all property within the trapezoidal shape immediately beyond the RPZ

*Approach Zone 2 (AZ 2):* includes all property within the trapezoidal shape immediately beyond AZ 1

*Noise Zones:* includes all property within the noise zones of Capital City Airport in excess of 60 dBA

*Perimeter Zone:* Includes all property within 200 feet of the installation perimeter of Boone National Guard Center and Capital City Airport

B. General requirements for the AOD.

The following general requirements apply to all zones within the AOD, including those properties within the Planning Influence Area.

1. *Notification of Kentucky Army National Guard and Capital City Airport.* All applications for rezoning and development approval, including subdivision plats, building permit applications, and other permits and plans in the AOD exceeding the following density and scale criteria shall be subject to review by a representative at Boone National Guard Center and Capital City Airport.
  - a) Residential projects with a density greater than 2 dwelling units per acre
  - b) Uses that concentrate more than 35 people at any one time
  - c) Uses that give off light or other impacts that could interfere with pilot vision



- d) Structures with heights that exceed standards set by the Federal Aviation Regulation Part 77 - Obstructions to Navigation

Such review shall be limited to issues of compatibility with Boone National Guard Center and Capital City Airport and issues affecting the safety of persons and property related to aircraft take-offs, landings, and flight operations. Comment shall be received in the form of a recommendation to the final approving authority.

- 2. *Formal Note.* All subdivision plats, property titles, and building and development permit applications within the AOD shall include a note disclosing the proximity of the site to the Boone National Guard Center and Capital City Airport.
- 3. *Uses interfering with aircraft.* It is unlawful to establish, maintain or continue any use within the county in such a manner as to interfere with the operation of aircraft. The following requirements shall apply to all lawfully established uses within the county.
  - a) *Height.* Uses shall comply with the requirements of Federal Aviation Regulation Part 77 - Obstructions to Navigation
  - b) *Obstruction marking and lighting.* Notwithstanding the provisions of any other article of this ordinance or any other ordinance, the owner of any structure or obstruction over 200 feet above ground level shall install marking and lighting on the structure in accordance with the specific standards established by Chapter 14-60, Rules of the Department of Transportation and Federal Aviation Advisory Circular 70-7460-1 Series and amendments thereto.
- 4. *Split parcels.* For purposes of regulating parcels split by the AOD lines, only that portion of a parcel that falls within the AOD shall be subject to the conditions of the AOD.

#### AOD REGULATIONS

- A. *RPZ regulations.* Areas within the RPZ overlay are subject to the following additional restrictions:
  - 1. The following uses are prohibited:
    - a) Any structures in the RPZ



- b) *Dangerous lighting.* All lights or illumination used in conjunction with street, parking, signs or use of land and structures shall be arranged and operated in such a manner that is not misleading or dangerous to aircraft operating from the runway.
- c) *Emissions.* No operations of any type shall produce smoke, gas, steam, glare or other visual emissions that can interfere with the safe use of the runway.
- d) *Aircraft-wildlife strike hazards.* Human-made or natural uses such as retention ponds, roosting habitats on buildings, landscaping, putrescible-waste disposal operations, wastewater treatment plants, agricultural or aquacultural activities, surface mining, or wetlands, may be used by wildlife for escape, feeding, loafing, or reproduction. Wildlife use of areas within an airport's approach or departure airspace, aircraft movement areas, loading ramps, or aircraft parking areas may cause conditions hazardous to aircraft safety. Human-made uses shall be sited in accordance with the following criteria to achieve adequate separation between the attractant and aircraft movement:
  - i. A distance of 10,000 feet from any runways, loading ramps, or aircraft parking areas

2. The following uses are permitted:

- a) Underground Utilities
- b) Permanent passive open space

B. *AZ 1 regulations.* Areas within the AZ 1 overlay are subject to the following additional restrictions:

1. The following uses are prohibited:

- a) All multi-family residential uses
- b) Manufactured home parks

2. Any uses permitted in the underlying zoning district. All permitted uses must comply with the following development standards:



- a) The maximum density of single unit per 1.5 acre. -family residential u
  - b) Any commercial uses permitted in the underlying zoning district. All permitted commercial uses must comply with the following development standards:
    - ii. Maximum building footprint shall be 15,000 square feet
    - iii. Maximum gross acreage lot coverage shall be 35%
    - iv. Minimum side yard setback shall be 10 feet
  - c) Any industrial uses permitted in the underlying zoning district. All permitted industrial uses must comply with the following development standards:
    - i. No industrial use shall have more than 50 employees per shift
    - ii. No industrial use shall exceed a lot coverage of 40%
- C. *AZ 2 regulations.* Areas within the AZ 2 overlay are subject to general requirements apply to the Planning Influence Area of the AOD.
- D. *Noise Zone regulations.* Areas within the 60 dBA or higher noise contour overlay are subject to the following additional restrictions:
- a) Noise reduction standards. All new residential buildings or structures with noise sensitive uses shall be constructed with sound protection based on the level of noise exposure within the 60 dBA or higher noise contours of Capital City Airport . These provisions shall apply to new residential or noise sensitive non-residential construction in noise zones located around airport. Noise reduction standards, construction and methods are specified in Naval Facilities Engineering Command's Sound Insulation Guidelines for Residences Exposed to Aircraft Operations.
  - b) The following is a list of noise sensitive land uses subject to this section:
    - i. Residential structures including but not limited to single-family and multi-family dwellings



- ii. Assisted living facilities, nursing facilities, adult day cares and similar congregated living uses
- iii. Facilities for religious worship or study
- iv. In-patient medical facilities including but not limited to hospitals and residential treatment centers
- v. Funeral homes
- vi. Child care facilities
- vii. Senior/community centers
- viii. Libraries
- ix. Schools including but not limited to primary and secondary schools, colleges and universities

E. *Perimeter Zone regulations.* Areas within the Perimeter Zone overlay are subject to the following additional restrictions:

1. Any uses permitted in the underlying zoning district. All permitted uses must comply with the following development standards:

- a) The maximum density of single unit per 1.5 acre.

-family residential u

- b) The maximum height of any structure shall be 35 feet.



## COMPREHENSIVE PLAN UPDATE LANGUAGE

One of the high priority outcomes of the JLUS is to develop specific Comprehensive Plan language that achieves consistency with compatibility recommendations. Plan policy is essential because it establishes a firm legal basis for the implementation of encroachment reduction actions. Plan elements can emphasize the adoption of specific compatibility tools, collaboration between the city and county and the National Guard, the desire to promote cooperative land use planning and complementary land use goals around Boone Center and Capital City Airport.

Amendments typically include revisions to the future land use, transportation and intergovernmental coordination policies of the plan.

The following are suggested goals and more specific policies that can be added to the Comprehensive Plan as separate elements or incorporated as part of existing goals and policies to strengthen current language.

*Goal: Land Use Compatibility* - Ensure that future development in the vicinity of Boone National Guard Center and Capital City Airport protects the public health, safety and welfare by maintaining compatibility with current and foreseeable training and aviation operations and minimizing land use conflicts resulting from exposure to the nuisances and safety risks of aircraft use.

*Policy: Compatible Land Use Measures* - Adopt zoning and other regulatory land use protection measures to promote compatible development within the Airport Overlay District identified in the Joint Land Use Study (JLUS). The AOD consists of a series of six overlapping sub-areas of geographic concern around Boone National Guard Center and Capital City Airport: aircraft noise contours; Runway Protection Zone; Approach Zones; perimeter buffer; and Planning Influence Area.

The AOD is the overall area of the City and County affected by the training and aviation activities of Boone National Guard Center and Capital City Airport. Certain land uses within this zone may expose the public to nuisance or safety risks associated with military and aviation operations or may pose a hazard to military personnel and aircraft. Within the AOD, the City and County will implement a variety of land use, communication and other mitigation techniques to reduce possible land use conflicts and protect the health and safety of people and property in affected areas. The appropriate strategies will vary based upon the particular operational impacts associated with each of the six sub-areas of the AOD.



*Policy: Support for Buffering Activities* – Open space, agriculture, and low density uses adjacent to military activities provide a critical buffer that protects surrounding areas from the nuisance and safety risks of nearby military operations and reduces opportunities for conflict that could degrade training activities; therefore, as part of overall compatibility strategies in the vicinity of Boone National Guard Center and Capital City Airport, the City and County will, whenever feasible, support efforts to preserve open space or plan for low density growth through tools such as conservation subdivision design.

*Goal: Planning Coordination* - Foster meaningful intergovernmental coordination and communication among the City, County, Kentucky Army National Guard, Capital City Airport and other regional partners to ensure that growth management and land use policies work in concert to facilitate the continued safe operation of Boone National Guard Center and Capital City Airport and to prevent incompatible land use activities in proximity to the airport.

*Policy: Joint Consultation* - Protect the current and long-term viability of National Guard and airport operations through effective coordination and communication with the Kentucky Army National Guard and Kentucky Airport Zoning Commission. The City and County will refer to Kentucky National Guard and Kentucky Airport Zoning Commission representatives for review and comment prior to final action proposed comprehensive plan amendments, land development code changes, subdivision plats, rezonings, building permits, and similar applications within the AOD. Representatives will review proposed actions or applications and provide comments to the City and County on the impact that such changes may have on the mission and operations of Boone National Guard Center and Capital City Airport and public safety.

*Policy: Support for Compatibility Implementation* - Continue active City and County participation in the JLUS implementation phase, including appointing primary points of contact and executing a Memorandum of Understanding among the City and County, Kentucky Army National Guard, Kentucky Airport Zoning Commission and area utility providers to promote the recommended communication and coordination strategies from the JLUS Report. The City and County will establish a sub-committee of the Frankfort/Franklin County Planning Commission to address compatibility issues on an ongoing basis.



## DEPARTMENT OF DEFENSE LAND USE COMPATIBILITY GUIDANCE



## SAMPLE MEMORANDUM OF UNDERSTANDING

Between Boone National Guard Center and Capital City Airport, Franklin County, the City of Frankfort and \_\_\_\_\_ (utility providers)

This Memorandum of Understanding between Boone National Guard Center, Capital City Airport, Franklin County, and the City of Frankfort is enacted to establish a mutually beneficial process that will ensure timely and consistent notification and cooperation between the parties on projects, policies, and activities. These parties have a mutual interest in the cooperative evaluation, review, and coordination of local plans, programs, and projects in the vicinity of Boone National Guard Center and Capital City Airport.

Franklin County and the City of Frankfort agree to:

1. Submit information to Boone National Guard Center and Capital City Airport on plans, programs, actions, and projects that may affect the conducting of military and aviation operations. This may include, but not be limited to the following:
  - Development proposals
  - Transportation improvements and plans
  - Sanitary waste facilities/wastewater facilities/ water facilities/any infrastructure necessary to support development
  - Open space and recreation
  - Public works projects
  - Land use plans, comprehensive plan, and ordinances
  - Rezoning and variances
  - School facility siting plan
  - Lighting plans for roadways, subdivision developments and major commercial/industrial developments
  - Capital Improvement Plans



- Demographic data
2. Submit to Boone National Guard Center and Capital City Airport for review and comment, project notification, policies, plans, reports, studies and similar information on development, infrastructure and environmental activities within proximity of Boone National Guard Center and Capital City Airport as defined by the established Airport Overlay District.
  3. Consider Kentucky Army National Guard and Kentucky Airport Zoning Commission comments as part of local responses or reports.
  4. Make information on Joint Land Use Study recommendations, including maps and development standards in noise and accident potential zones readily available to the public.
  5. Explore the application of growth management techniques, such as establishing an Airport Overlay District (AOD).
  6. Coordinate city/county annexation and public infrastructure extensions to complement the goal of encroachment reduction in established the AOD.
  7. Mark all plats in the established Boone National Guard Center and Capital City Airport with an "Area of Military/Airport Impact Plat Notification".
  8. Include Boone National Guard Center and Capital City Airport in the distribution of meeting agendas for, but not limited to:
    - City Council or Fiscal Court Meetings
    - Joint Planning Commission Meetings
    - Transportation Studies
    - Public Works Studies



Boone National Guard Center and Capital City Airport agree to:

1. Submit information to City and County representatives on plans, programs, actions, and projects which may affect the city or county. These may include, but not be limited to, the following:
  - Installation Master Plan
  - Noise Management Studies or Contour Updates
  - Changes in existing installation or airport use that may change off-post impacts, such as noise and traffic movement
  - Appropriate data on troop strength and activities for local plans, programs and projects
  - Initiatives that may affect mission activities and the number of personnel
  - Schedule of training activities when feasible
2. Submit to City and County representatives for review and comment, project notification, policies, plans, reports, studies and similar information on development, infrastructure and environmental activities at Boone National Guard Center and Capital City Airport.
3. Make information on Joint Land Use Study recommendations, noise mitigation and encroachment reduction strategies readily available to the public.

\_\_\_\_\_ (utility providers) agree to:

1. Submit information to Boone National Guard Center and Capital City Airport representatives on plans, programs, actions, and projects which may affect the Boone National Guard Center and Capital City Airport. These may include, but not be limited to, the following:
  - Infrastructure planning documents



This agreement will remain in effect until terminated by any of the parties. Amendments to this memorandum may be made by mutual agreement of all the parties. Review process details and appropriate forms may be developed to facilitate uniform and efficient exchanges of comments.

This understanding will not be construed to obligate the Kentucky Army National Guard, Kentucky Airport Zoning Commission, the City of Frankfort or Franklin County to violate existing or future laws or regulations.

This agreement is approved by:

---

County

---

City

---

Boone National Guard Center

---



Capital City Airport

---

Utility Provider



**SAMPLE REAL ESTATE DISCLOSURE****AIRPORT OVERLAY DISTRICT IMPACT****REAL ESTATE DISCLOSURE FORM**

*Property at the following location is situated within the vicinity of SAMPLE REAL ESTATE DISCLOSURE*

**AREA OF MILITARY IMPACT****REAL ESTATE DISCLOSURE FORM**

Property at the following location is situated within the vicinity of Boone National Guard Center and Capital City Airport. The subject property may therefore be exposed to periodic low-level military and civilian aircraft over-flights and associated noise and vibration, the risk of an aircraft accident, and other impacts associated with standard military training activities.

Parcel #: \_\_\_\_\_ Deed Book # \_\_\_\_\_ Page # \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_

I, \_\_\_\_\_, (owner of the subject property) hereby certify that I have informed \_\_\_\_\_ (prospective purchaser/lessee/renter) that the subject property is located within the vicinity of Boone National Guard Center and Capital City Airport and may therefore be exposed to periodic low-level military and civilian aircraft over-flights and other such military training activities.



---

*Owner/ Date*

I, \_\_\_\_\_, (prospective purchaser/lessee/renter of the subject property) hereby certify that I have been informed by \_\_\_\_\_ (owner) that the subject property is located in the vicinity of Boone National Guard Center and Capital City Airport and may therefore be exposed to periodic low-level military and civilian aircraft over-flights and associated noise and vibration, the risk of an aircraft accident, and other impacts associated with standard military training activities.

---

*Purchaser/Lessee/Renter Date*

Signed before me on this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, in the

County of \_\_\_\_\_, Kentucky

\_\_\_\_\_, Notary Public, State of Kentucky

My Commission Expires on \_\_\_\_\_. (SEAL)



## CONSTRUCTION PRACTICES FOR SOUND ATTENUATION

Element	Location	STC	Requirement
Exterior walls	All perimeter walls	39	2 x 4 stud wall required with 5/8-inch exterior sheathing and 5/8-inch gypsumboard or plaster interior
Exterior walls	All perimeter walls		Insulation grade R-9 required
Exterior walls	All perimeter walls		No thru-wall HVAC
Windows	All habitable rooms	30	Stucco, brick, or siding homes - STC 30
Windows	All bedrooms		Window area max. 20% of floor area
Exterior doors	All doors to house	28	1-3/4-inch prime solid-core wood or insulated metal
Exterior doors	All doors to house		No thru-door openings
Roof construction	Entire house	39	Rafter depth 6 inches or more
Attic and kneewall	Vented attic and pitched roof		Insulation grade R-19 required
Ceiling	All habitable rooms	28	1/2-inch-thick gypsumboard or plaster
Ceiling under roof	All habitable rooms		Skylights STC-28
Floor	Over crawl space		Max vent area 2% of floor area
Ventilation	Entire house		Fresh air requirements met with windows and doors closed
Ventilation	Kitchen		Baffle vents to exterior
Ventilation	Attic		Code Minimum Number Gravity Vents

Element	Location	STC	Requirement
Exterior walls	All perimeter walls	44	2 x 4 stud wall required with 5/8-inch exterior sheathing and 5/8-inch gypsumboard or plaster interior
Exterior walls	All perimeter walls		Interior walls resiliently mounted
Exterior walls	All perimeter walls		Insulation grade R-11 required
Exterior walls	All perimeter walls		No thru-wall HVAC
Windows	All habitable rooms	36/40	Stucco or brick homes - STC 36; siding homes - STC 40
Windows	All bedrooms		Window area max. 20% of floor area
Exterior doors	All doors to house	35	1-3/4-inch prime and storm door
Exterior doors	All doors to house		No thru-door openings
Roof construction	Entire house	44	Rafter depth 6 inches or more
Attic and kneewall	Vented attic and pitched roof		Insulation grade R-19 required
Ceiling	Habitable rooms under pitched roof with attic	44	5/8-inch-thick gypsumboard or plaster
Ceiling under roof	All habitable rooms		No skylights
Floor	Lowest occupied rooms	49	Slab or enclosed basement/crawlspace
Floor	Over crawl space		Insulation grade R-9 required
Ventilation	Entire house		Fresh air requirements met with windows and doors closed



Ventilation	Kitchen		Baffle vents to exterior
Ventilation	Attic		No gravity vents
Miscellaneous	All habitable rooms		No vented fireplaces

Element	Location	STC <sup>1/</sup>	Requirement
Exterior walls	All perimeter walls	49	2 x 4 staggered stud wall required with 5/8-inch exterior sheathing and sealed top and bottom and 1-inch gypsumboard or plaster interior
Exterior walls	All perimeter walls		Interior wall not rigidly connected to exterior wall studs
Exterior walls	All perimeter walls		Insulation grade R-11 required
Exterior walls	All perimeter walls		No thru-wall HVAC
Windows	All habitable rooms	40/24	Brick homes - STC 40; stucco or siding homes - STC 42
Windows	All bedrooms		Window area max. 20% of floor area
Exterior doors	All doors to house	38	1-3/4-inch prime and storm door
Exterior doors	All doors to house		No thru-door openings
Roof construction	Entire house	49	Rafter depth 6 inches or more
Attic and kneewall	Vented attic		Insulation grade R-30 required
Ceiling	Habitable rooms under cathedral ceiling, flat or pitched roof without attic		Resilient ceiling attachment
Ceiling	All habitable rooms		1-inch-thick gypsumboard or plaster
Ceiling under roof	All habitable rooms		No skylights
Floor	Lowest occupied rooms	49	Slab or enclosed basement/crawlspace
Floor	Over crawl space		Insulation grade R-11 required
Ventilation	Entire house		Fresh air requirements met with windows and doors closed
Ventilation	Kitchen		No vents direct to exterior
Ventilation	Attic		No gravity vents
Miscellaneous	All habitable rooms		No vented fireplaces