

Fort Jackson | McEntire **JOINT LAND USE STUDY**



NOVEMBER, 2009 - FINAL REPORT

Acknowledgements

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The Fort Jackson/McEntire Joint Land Use Study (JLUS) is a cooperative land use planning initiative between the U.S. Army, South Carolina National Guard, U.S. Air Force, South Carolina Air National Guard and the surrounding cities and counties of the region.

Partners in the JLUS study include: the Central Midlands Council of Governments, City of Columbia, City of Forest Acres, Kershaw County, Richland County, Fort Jackson, McCrady Training Center (TC) and McEntire Joint National Guard Base (JNGB).

This document serves as an ongoing guide to local government and military actions to enhance compatibility around Fort Jackson/McCrady TC and McEntire JNGB and strengthen the civilian-military relationship.

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Acronyms

ACUB: Army Compatible Use Buffer. See JCUB
AICUZ: Air Installation Compatible Use Zone
CMCOG: Central Midlands Council of Governments
dB: Decibel
DNL: Day-Night Average Sound Level
DoD: Department of Defense
EPA: Environmental Protection Agency
FAA: Federal Aviation Administration
HUD: US Department of Housing and Urban Development
IBC: International Building Code
IRC: International Residential Code
JCUB: Joint Compatible Use Buffer (regional program)
JLUS: Joint Land Use Study
JNGB: Joint National Guard Base
MAJIC: Midlands Area Joint Installation Consortium
MLRS: Multiple Launch Rocket System
MTC: McCrady Training Center
NVG: Night Vision Goggles
PIA: Priority Investment Act (State of South Carolina)
PDR: Purchase of Development Rights
SCARNG: South Carolina Army National Guard
STC: Sound Transmission Class
TDR: Transfer of Development Rights

Executive Summary





South Carolina Air National Guard Aircraft at McEntire JNCB



Soldiers Training at Fort Jackson

Executive Summary

The purpose of this Joint Land Use Study (JLUS) is to ensure that the surrounding communities of the Central Midlands can sustain economic activity without degrading the military missions of Fort Jackson, McCrady Army National Guard Training Center, and the McEntire Joint National Guard Base.

Study Purpose

Members of regional and local governments, along with US Army, US Air Force, South Carolina Air National Guard, and South Carolina Army National Guard representatives joined in initiating this effort to study current development issues, growth trends, and evolving mission needs and to strengthen land use planning around the installations.

Study Findings

Fort Jackson's mission is to conduct Basic Combat Training and Advanced Individual Training; train Drill Sergeants and Cadre Leaders; and effectively transform civilians, train Soldiers and develop leaders. The installation is the largest and most active Initial Entry Training Center in the U.S. Army, training 50 percent of all Soldiers and 70 percent of women entering the Army each year.

The South Carolina Army National Guard (SCARNG) trains at McCrady Training Center (MTC) on Fort Jackson. The mission of the SCARNG is to deliver a fully capable level of military preparedness and response to protect the lives and property of the people of South Carolina during times of emergency.

The 169th Fighter Wing is the primary unit of the South Carolina Air National Guard at McEntire Joint National Guard Base (JNGB). The mission of the 169th Fighter Wing (FW) is to maintain wartime readiness and the ability to mobilize and deploy rapidly to carry out tactical air missions or combat support activities in the event of a war or military emergency. The 169th FW flies the F-16 Fighting Falcon, a single-seat multi-purpose fighter.

Fort Jackson/MTC and McEntire JNGB are major economic engines for the region. The post circulates more than \$1.2 billion through the economy each year. Growth and construction activity related to Base Realignment and Closure (BRAC) will inject an additional \$2.25 billion in spending and output and create 889 direct and indirect employment opportunities by 2018. Visitation related to graduation at Fort Jackson also generates an estimated \$30 million to \$35 million each year. The SCARNG at MTC contributes approximately \$300 million each year to the local communities in which Guard members live and train, while total annual expenditures at McEntire JNGB are an estimated \$135 million.

As with all active military installations, routine training and readiness activities at Fort Jackson/MTC and McEntire JNGB produce various impacts, including noise and the risk of an aircraft accident that can affect the quality of life in surrounding communities. In general, the installations have scattered existing land use compatibility issues related mainly to housing and manufactured housing units in noise areas east and north-east of Fort Jackson/MTC and in the air safety zones and noise contours to the north, south, and west of McEntire JNGB. While much of the land in the JLUS study area is zoned for rural purposes, current

regulatory tools in Kershaw County and Richland County do not explicitly address key compatibility issues. The major corridors connecting the study area to Columbia, particularly Percival Road, Leesburg Road, and Garners Ferry Road are also vulnerable to the ongoing spread of linear commercial activity, which could catalyze future residential growth.

Recommendations

Based on the feedback of the Policy Committee and Technical Committee, as well as public input, the JLUS identifies the following near-term actions to reduce the threat of encroachment and promote land use compatibility around the installations:

- Creating new overlay zoning codes for areas around Fort Jackson/McCrady TC and McEntire JNGB;
- developing Comprehensive Plan language to promote community/military coordination;
- exploring the purchase of development rights from willing property owners near the post or base as part of the Midlands Area Joint Installation Consortium;
- establishing an ongoing JLUS Partnership organization;
- improving the flow of vehicular traffic onto Fort Jackson and promoting corridor planning near the post and base;
- using special design and construction practices to lower noise in new homes;
- requiring the release of information on possible military impacts as part of real estate transactions;
- ensuring that residents and businesses have adequate information about military operations and possible impacts; and
- promoting city and county coordination in the planning of future growth areas in Richland County.

The JLUS also identifies a series of strategic, long-term actions for the region.

1.0 Purpose





Fort Jackson National Cemetery



Rural Farm Road near McEntire JNGB

1.0 Purpose

The purpose of this Joint Land Use Study (JLUS) is to ensure that the surrounding communities of the Central Midlands can sustain economic activity without degrading the military missions of Fort Jackson, McCrady Army National Guard Training Center, and the McEntire Joint National Guard Base.

1.1 Study Goals

The goals of the study are to:

- Evaluate the potential operational and economic impacts of current and future military activities on surrounding communities;
- Evaluate the potential impacts of community growth on the long-term viability of Fort Jackson/McCrady Training Center and McEntire JNGB; and
- Recommend action items to reduce encroachment and facilitate future collaboration among study partners.

Members of regional and local governments, along with US Army, US Air Force, South Carolina Air National Guard (ANG), and South Carolina Army National Guard (ARNG) representatives joined in initiating this effort to study current development issues, growth trends, and evolving mission needs and to strengthen land use planning around the installations.

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.

This report includes a series of recommended policies and regulations for the US Army, US Air Force, South Carolina Army National Guard, South Carolina Army National Guard and local governments to consider. It is the responsibility of each participating entity to review the proposals and implement recommendations appropriate for their local context.

1.2 Overview of Document

The JLUS report consists of the following sections:

Background

This section summarizes the involvement of Committee members, stakeholders and the general public in developing the issues, priorities, and recommendations of the JLUS; gives an overview of the installations' history and current and foreseeable missions; estimates the economic impact of proposed growth at Fort Jackson/MTC and McEntire JNGB; and summarizes environmental and infrastructure issues, growth trends, and recent development activity around the post and base.

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-post and 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, as well as by the US Army and US Air Force.

Compatibility Analysis

This section defines land use compatibility and highlights current or foreseeable land use conflicts in the communities surrounding Fort Jackson/MTC and McEntire JNGB based on zoning and land use plans.

Compatibility Tools

This section identifies general strategies to promote land use compatibility around Fort Jackson/MTC and McEntire JNGB and establishes a set of prioritized key actions to reduce the risk of encroachment in the most vulnerable areas.

Implementation Plan

This section organizes recommended actions by partner.

Technical Appendices

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

2.0 Background





Soldiers at Fort Jackson/McCrary Training Center



South Carolina Army National Guard

2.0 Background

Fort Jackson/McCrary TC and McEntire JNGB are part of a dynamic Central Midlands region in South Carolina that will continue to see growth in both the civilian and military sectors.

2.1 Regional Context

Fort Jackson, McCrary Army National Guard Training Center (MTC), and McEntire Joint National Guard Base (JNGB) are in central South Carolina, directly east of the City of Columbia in Richland County. The installations are bounded by Leesburg Road on the south, U.S. Highway 601 on the east, Screaming Eagle Road on the northeast, Percival Road on the northwest, and Interstate 77 to the west. (See Figure 2.1). Surrounding communities include unincorporated Richland County, the Cities of Columbia and Forest Acres to the west, Kershaw County to the northeast and Sumter County to the east. Approximately 15,000 acres in the eastern portion of Fort Jackson is licensed to the South Carolina Army National Guard (SCARNG) and constitutes the MTC.

The City of Columbia incorporated Fort Jackson in 1968. Over the years, the cities and counties around Fort Jackson and McEntire JNGB have grown along with the military, reinforcing a close economic and social relationship. This interdependence raises the central challenge of the Joint Land Use Study (JLUS).

As military installations expand, they bring new people and economic activity to an area. Communities build houses, schools and infrastructure, and create new jobs to support Soldiers, Guardsmen, civilian workers, and their families. More people begin to live and work in proximity to the noise and safety risks generated by military training. The presence of these civilian uses can in turn place pressure on installations to modify their operations, possibly compromising mission viability. This land use conflict, referred to as encroachment, threatens the ability of the U.S. military to conduct the realistic training activities necessary for combat readiness. Conversely, military training impacts such as noise from aircraft or weapons firing can diminish quality of life for affected local residents.

2.2 What is Encroachment?

The long-term goal of the JLUS is to reduce potential encroachment, accommodate growth and sustain the regional economy. The term 'encroachment' describes the operational impacts of military 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 Accident Potential Zones (APZs) and Noise Zones — extend beyond property owned by McEntire JNGB and Fort Jackson into surrounding communities.

While noise and safety concerns can affect residents living and working around the post and base, certain nearby civilian land uses that concentrate people, such as higher density housing or public gathering places can threaten training operations. Ongoing complaints about noise and night flights can place pressure on Fort Jackson/MTC and McEntire JNGB to modify current operating procedures, reducing realistic training capabilities.

Encroachment thus produces two unwanted conditions: nearby residents and businesses are exposed to a higher than normal level of nuisance, such as noise,

or safety hazards associated with a low probability but high consequence event such as an aircraft accident; conversely, complaints and concerns regarding quality of life and safety in the community limit the training flexibility of the military, thus compromising current mission effectiveness and preventing future mission expansion.

Methods of reducing and preventing encroachment include a menu of tools, such as compatible land use planning, infrastructure planning, site development requirements, operational changes on the post and base that do not compromise mission viability, and wildlife habitat conservation. One of the purposes of the JLUS is to provide feasible and locally appropriate recommendations to minimize encroachment potential and to develop clear guidance for assessing the compatibility of local growth options.

While encroachment is currently not severe around most of Fort Jackson/MTC and McEntire JNGB, changing market conditions, continued population growth, and expanding corporate boundaries can quickly reshape development patterns near critical training operations. The JLUS is at its most effective as a proactive process that identifies and minimizes foreseeable threats to military readiness, public safety, and regional quality of life.

2.3 Public Participation

The JLUS process seeks to create a community-based plan that builds consensus from varied interests, including residents, local elected officials, businesses, and military representatives.

Committees

A successful JLUS requires active and broad participation so that strategies reflect the diversity of the region and build adequate support for ongoing implementation. The JLUS planning team worked closely with two committees throughout the planning process. The purpose of this organizational structure is to ensure that the final JLUS report includes a cross-section of feasible, practical solutions to encroachment challenges.

Policy Committee

The Policy Committee consisted of local elected officials from each participating jurisdiction, along with leadership from Fort Jackson/MTC and McEntire JNGB. The Policy Committee oversaw the JLUS process, reviewed

draft and final written reports, and evaluated policy recommendations. The JLUS study does not supersede the regular local legislative process. Locally elected officials remain responsible for formally adopting any recommended regulatory policies they deem appropriate for their community. The planning team also conducted a series of briefings about report recommendations before the Columbia City Council, the Richland County Council, and the Kershaw County Council.

Technical Committee

This working group consisted of area planners, city and county managers, technical and professional staff and military planners. Members were responsible for assisting in data collection, identifying and studying technical issues, and developing recommendations evaluated by the Policy Committee.

Stakeholders

The planning team conducted a series of stakeholder interviews with military and civilian leaders to identify issues, establish priorities, and guide policy development. In summary, respondents highlighted the following issues around Fort Jackson/MTC and McEntire JNGB:

Fort Jackson and MTC:

- Concern about traffic entering Fort Jackson with long vehicle queues affecting Exit 10 and Exit 12, especially on graduation days;
- Impacts of growth and light pollution on night training activities at both installations;
- Community growth impacts on wildlife management activities on Fort Jackson/McCrary; continued development in the community drives wildlife, such as the Red-cockaded woodpecker, onto Fort Jackson, thereby increasing the demand for protective actions that can restrict military training options;
- Desire to increase public awareness of the economic impacts of the military on the region;
- Utility capacity at both installations must expand to accommodate increased demand related to mission growth;
- Desire to enhance communications between military installations and regional community and build on regional coordination through efforts like the Midlands Area Joint Installation Consortium (MAJIC);
- Smoke management concerns related to prescribed burns on the post, which are required to preserve habitat and maintain training areas;

- The critical importance of Fort Jackson/McCrary remaining open for the 1st/178th FA to conduct live fire training for certification purposes during a drill weekend;
- Emerging residential uses to the northeast of the post, particularly along Percival Road and in the Spear Creek area;
- Higher-end homes (\$500,000-\$1 million) just outside old Gates 6 and 7 and in Kings Grant (around Gate 1) and Yorkshire Springs; and
- Increasing residential growth to the south along Leesburg Road (South Carolina Highway 262), particularly from Weston Lake west to Semmes Road.

McEntire JNGB:

- Concern about potential growth induced by planned sewer extension near McEntire Joint National Guard Base;
- Impacts of growth and light pollution on night training activities at both installations;
- Utility capacity at both installations must expand to accommodate increased demand related to mission growth;
- Desire to increase public awareness of economic impacts the military has on the region;
- Desire to enhance communications between military installations and regional community and build on regional coordination through efforts like the Midlands Area Joint Installation Consortium (MAJIC);
- Clearance issues, such as tall trees and cellular/communications towers in flight paths around the base;
- Some existing encroachment with housing in Clear Zone and Accident Potential Zones ;
- Bird airstrike hazards (BASH), which can compromise the safety of aircraft operation;
- Smoke management concerns related to prescribed burns on the base, which are required to preserve habitat and maintain training areas; and
- Lack of any real structure in place to conduct outreach about mission change.

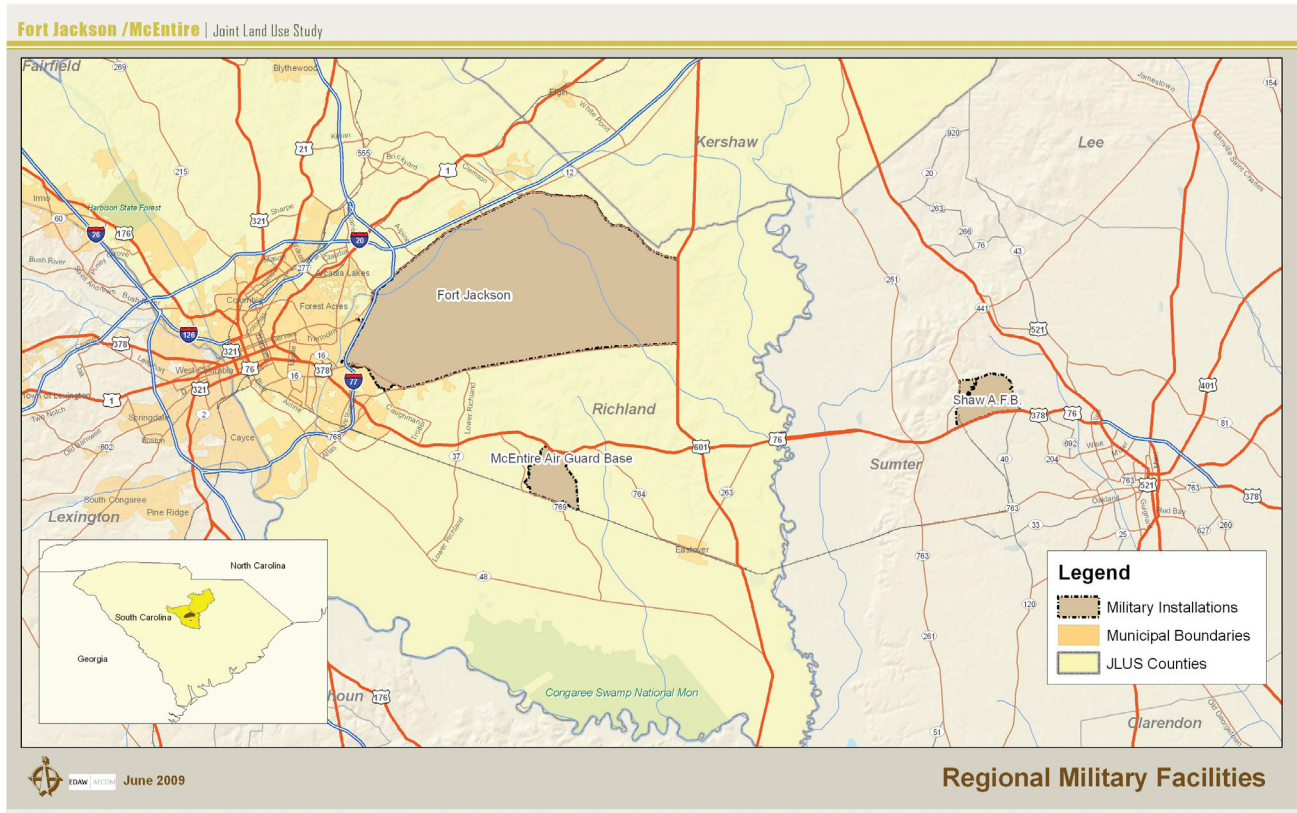


Figure 2.1: JLUS Regional Context, Regional Military Facilities

COMMITTEE	DATE
Kick Off (Technical Committee)	August 28, 2008
Kick-Off (Policy Committee)	February 9, 2009
Technical Committee Meeting #2	February 20, 2009
Technical Committee Meeting #3	April 13, 2009
Technical Committee Meeting #4	May 19, 2009
Policy Committee Meeting #2	May 19, 2009
Technical Committee Meeting #5	July 27, 2009
Policy Committee Meeting #3	August 11, 2009

Table 2.1: Policy and Technical Committee Meeting Dates

Community Outreach

Active public involvement is a critical component of the JLUS. Public forums created a valuable opportunity to educate residents about training operations and the economic impact of the mission and to build trust between the military and community. Residents in turn informed 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 were also essential for conveying information about conservation or development options that maintain compatibility with adjacent training activities.

Public Meetings

The JLUS planning team conducted three rounds of public involvement events that corresponded with the availability of existing conditions findings, land use conflict analysis findings, and final compatibility recommendations. These meetings gave residents an opportunity to understand current issues and trends; to assist in identifying operational impacts, such as noise, that warrant further study and possible mitigation; to review draft land use compatibility tools; and to provide input on implementation strategies. The planning team also conducted a series of smaller neighborhood-based briefings to increase awareness of the study and participation opportunities.

Website and Interactive Media

In addition to public meetings, the public could access a website that tracked the progress and results of the Joint Land Use Study at <http://jacksonjlus.com>. The site hosted regular meeting notices, newsletters, Frequently Asked Questions, links to participating entities, technical reports and maps, and contact information.

Members of the public could also participate in a web-

based survey to gather additional community input. Similar to the Attitude Survey conducted by the Fort Jackson and McCrady Training Center, this survey gauged public awareness about the military's role in the region, concern about the operational impacts experienced in surrounding areas, and interest in possible compatibility strategies.

Interactive Survey Findings

The interactive web-based survey sought feedback on the importance of the military to the community and concern about noise and safety risks. The Appendix contains a copy of the survey and responses received.

100% of the respondents believed that the military is important to the community, and half of the respondents indicated a general concern about traffic, noise and safety risks related to military activity. 88% supported additional sound attenuation on new residential construction, and notifying potential buyers about noise impacts. 88% of respondents also supported special zoning around the region's military installations. A smaller portion of respondents, 84%, supported voluntary purchase of development rights on properties near Fort Jackson and McEntire JNGB.

Participants were given the opportunity to make open comments, and most of this feedback fell into three categories: 1) Support of the military installations, 2) Concern about traffic accessing Fort Jackson, and 3) Concern about cost and resale impact of any additional building and notification requirements.

Previous Survey

The South Carolina Army National Guard commissioned the University of South Carolina's Institute for Public Service and Policy Research (IPSPR) to conduct a survey of residents living near Fort Jackson and the McCrady Training Center. The primary question of interest in the survey was how various activities at Fort Jackson and the McCrady Training Center affected households in the area. The questionnaire included 15 such activities and asked respondents to rate the impact of each activity to their household on a scale from zero (no impact) to six (serious adverse impact). The results indicated that respondents generally did not believe that their lives were adversely affected by activities at Fort Jackson or the McCrady Training Center. The activity that generated the highest percentage of "6" responses (seriously adversely affected) was 2.6% for occasional intense vibration, followed by

occasional intense training noise (2.2%), and vibration on a typical day (1.0%). For the remaining 12 activities, the percentage of “seriously adversely affected” responses was less than one percent.

More than three-quarters of survey respondents stated that proximity to the post did not influence their decisions about where to live. However, when proximity to the post did affect locational choice, 20.7 percent of residents said it was a positive factor, while 1.1 percent felt it was a negative factor.

MEETING	LOCATION	DATE
Round #1	Lower Richland	March 13, 2009
Round #1	City of Forest Acres	March 14, 2009
Round #2	Lower Richland	June 1, 2009
Round #2	City of Forest Acres	June 2, 2009
Round #3	Lower Richland	August 3, 2009
Round #3	City of Forest Acres	August 4, 2009

Table 2.2: Public Participation Meeting Dates

2.4 Military Mission

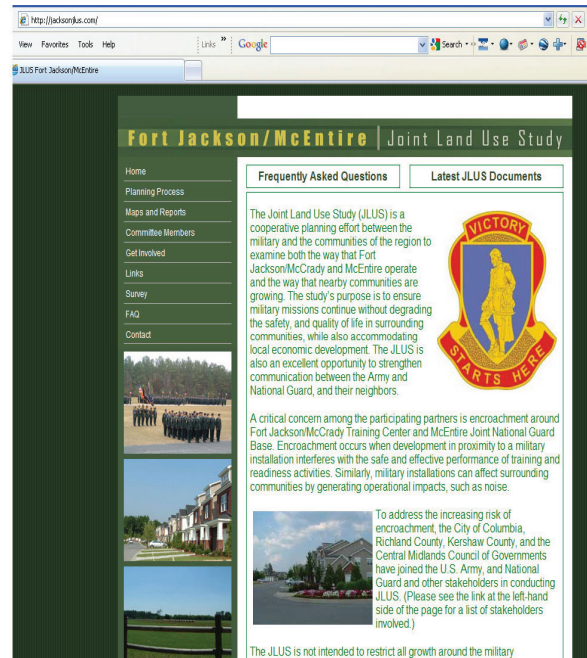
Fort Jackson

History

The War Department designated Camp Jackson, South Carolina as a World War I training facility in July 1917. After less than eight months of construction, the camp, named in honor of President Andrew Jackson, accommodated more than 20,000 men as they trained for combat. The celebrated 81st “Wildcat” Division, the first Army unit to create a uniform patch, organized at Fort Jackson in August of 1917.

Over the years, the post’s operations have fluctuated to reflect the nation’s changing state of readiness and emerging military threats. The Army abandoned the camp in 1922 as a regular military training facility, but the South Carolina National Guard used it as a summer encampment.

As conflict intensified in Europe, the US began to enlarge its military forces and in 1939 the Army reactivated Camp Jackson. The camp hosted the 6th Division, which gathered units from smaller posts all over the country for training and field maneuvers. During this period, the post increased in size to approximately 53,000 acres. In July of 1940, the camp transitioned to Fort Jackson and received the 8th (Pathfinder) Division, whose mission was to train



Screenshot of the JLUS Website

enlistees and selectees to be skilled soldiers and effective replacements in combat units. The first tanks arrived at Fort Jackson in early 1942 when the Army transferred the 757th Tank Battalion to the post from Fort Knox, Kentucky. Capitalizing on ideal terrain conditions, the tanks joined the infantry, artillery, and mechanized cavalry units already training at Fort Jackson. Other units organized at Fort Jackson during this period included the 100th Infantry Division, the 2nd Cavalry Division, the 30th Division, 5th Division, and the 2nd Infantry. The post also began to host numerous parades and reviews as part of its training schedules, beginning a ceremonial function that continues to this day.

Though there was a pause in intense training following the victory in Europe, Fort Jackson quickly ramped up to accommodate the reactivated the 8th Infantry Division during the Korean War. In 1956, The Department of Defense (DoD) formally designated Fort Jackson as the United States Army Training Center, Infantry, while the 101st Airborne Division, once stationed at the post, transferred to Fort Campbell, Kentucky. This action was part of a new Department of the Army policy to provide training centers with clearly defined missions.

Fort Jackson continued its mission to train individuals as replacements for Army units assigned in the United States



Graduation at Fort Jackson

and overseas. In 1965, the Army announced its Build-Up initiative, almost quadrupling the average training load at the US Army Training Center, Fort Jackson. In 1967, the Department of Defense established the Third United States Army Drill Sergeant School at Fort Jackson. The post also began to function as a Reception Station that administratively processed all United States Regular Army, Army Reserve, National Guard, or prior service personnel ordered to active duty. After a four-day processing period in the Reception Station, the Army assigned trainees to Fort Gordon or one of the Basic Combat Training Brigades, either the 1st or 2nd Training Brigade, at Fort Jackson.

During this period, approximately 22 percent of the trainees that completed Basic Combat Training remained at Fort Jackson for additional Vietnam-oriented Advanced Individual Infantry Training or Combat Support Training. The remaining 78 percent of the trainees proceeded to advanced training at schools or with units throughout the continental United States.

In June 1973, the Army designated Fort Jackson as a U.S. Army Training Center. Base Realignment and Closure decisions have also added to the mission, transferring several key tenants to Fort Jackson: the Soldier Support Institute in 1995; the United States Army Chaplain Center and School in 1995; and the DoD Polygraph Institute in 1999. Fort Jackson remains a desirable and productive military installation, resulting in the continued growth of readiness activities on the post.

Major Tenant Units

Fort Jackson's major units include the 193rd Infantry Brigade, which conducts Basic Combat Training; the 34th Infantry Regiment; the 61st Infantry Regiment; the 165th Infantry Brigade; the 171st Infantry Brigade; and the 187th Ordnance Battalion.

Other military units and tenant organizations include:

- U.S. Army Chaplain Center and School
- U.S. Army Soldier Support Institute
- 157th Infantry Brigade
- U.S. Army Dental Activity (DENTAC)
- U.S. Army Medical Department Activity (MEDDAC)
- Military Entrance Processing Station (MEPS)
- Savannah Rapids District Veterinary Command
- Defense Academy for Credibility Assessment
- 81st Regional Support Command
- Defense Military Pay Office
- 37th Military Police Detachment
- DET 336th Training Squadron
- Corps of Engineers
- Defense Security Service
- Defense Reutilization and Marketing Office
- USAR Readiness Command
- 360th Civil Affairs Brigade (Airborne)
- 319th Public Affairs Detachment
- 310th Personnel Group
- 12th Legal Support Organization
- 175th Maintenance Company
- 874th Medical Team Forward Surgical
- 7226th Medical Support Unit
- S.C. National Guard Training Center

Installation Facilities and Personnel

Fort Jackson encompasses more than 52,000 acres, including over 100 ranges and field training sites and 1,160 buildings. Contained within Fort Jackson are 146 training areas, which encompass approximately 44,900 acres, including McCrady Training Center (MTC).

The post has two impact areas: West and East. The West Impact Area includes 4,739 acres and is surrounded by 20 small arms ranges that are used for Basic Rifle Marksmanship. The East Impact Area, also known as the Artillery Impact Area, encompasses 5,250 acres near the

center of the installation and is used for mortar and artillery weaponry training. The East Impact Area also contains the Engineer Demolition Site. This site is available for use of demolition up to 200 pounds.

Weapons historically fired at the McCrady Training Center include the 155-mm self-propelled howitzer and the Multiple Launch Rocket System (MLRS). Additionally, the Tank Range is leased from Fort Jackson and is used for training M1A1 Tank and Bradley Fighting Vehicles.

Over the past few years, due to reorganization and deployments, the amount of large caliber weapon activity has decreased. One battalion, and its assigned MLRS, has relocated from MTC. The remaining MLRS is typically fired once or twice a year for a period of three to four days.

Fort Jackson does not have airfield facilities or assigned aircraft. However, transient aircraft, including fixed-wing and rotorcraft, use the airspace above the installation to conduct training activities. In 2007, the number of sorties was 3,416. Many of the transient helicopters that use Fort Jackson airspace belong to the SCARNG Army Aviation Support Facilities (AASF), a tenant activity stationed at McEntire JNGB. Aircraft conducting low-level training at Fort Jackson include 16 AH-64 Apaches, 8 UH-60 Blackhawks, 8 OH-58A Kiowa and 4 CH-47 Chinook helicopters. Helicopters often travel between McEntire JNGB and the MTC, creating some noise impacts. Helicopter training takes place typically three nights per week with additional operations conducted two days per week and two weekends per month. Activity levels usually do not exceed eight to ten operations per day.

Fort Jackson typically hosts an on-post population of more than 37,000 with 9,400 permanent military and civilian personnel and over 28,000 trainees and students. Approximately 30 percent of the permanent military personnel reside on the post, while the remaining 70 percent live in the surrounding communities, primarily in Richland County. More than 36,000 retirees and their families also live in the area.

Within the broader 40-mile regional area, the installation supports a population in excess of 100,000, including military dependents, military retirees and transient or reserve personnel.

Current and Foreseeable Activities

Fort Jackson's mission is to conduct Basic Combat Training and Advanced Individual Training; train Drill Sergeants and Cadre Leaders; and effectively transform civilians, train Soldiers and develop leaders. The installation is the largest and most active Initial Entry Training Center in the U.S. Army, training 50 percent of all Soldiers and 70 percent of the women entering the Army each year.

Basic Combat Training (also known as Initial Entry Training) is the rigorous program of physical and mental training required for an individual to become a soldier in the United States Army. It consists of two parts: Basic Combat Training, or BCT, covers the first 9 weeks of the total Basic Training period and teaches the fundamentals of being a Soldier from combat techniques to strenuous physical exercise and the proper way to address a superior. The remainder of the total Basic Training period consists of Advanced Individual Training, or AIT, which varies by Army career path. More than 50,000 Soldiers participate in BCT and AIT every year at Fort Jackson.

The post is home to other missions as well, such as the U.S. Army Soldier Support Institute, the U.S. Army Chaplains Center and School, and the Defense Academy for Credibility Assessment (formerly the Department of Defense Polygraph Institute). In the next few years, the Chaplain School's mission will expand to train chaplains in all branches of the armed forces. Also, the Army plans to consolidate its drill sergeant schools at Fort Jackson.

The three primary Base Realignment and Closure initiatives for Fort Jackson (Armed Forces Chaplaincy Center, Consolidated Drill SGT School, and the 81st Regional Support Command) will have a minimal impact on the number of Soldiers, civilians, contractors, families and trainees assigned to the post. Overall, the installation will experience a four percent increase in personnel, growing from 82,454 to 85,591.

McCrady Training Center (MTC)

History

The South Carolina Army National Guard (SCARNG) has been training at MTC since 1974. The MTC first licensed a portion of Fort Jackson from the Department of the Army (DA) to become the new training site for the SCARNG. The original license was for the 200-acre cantonment area. Since initial operations, the MTC has grown as a result of changes in mission, equipment, and armament. Currently,

MTC has nearly 15,000 acres available for year-round training. Company F, 4th Light Armored Reconnaissance Battalion, 4thMarDiv of the Marine Reserve Corps out of Eastover also trains at MTC.

Installation Facilities and Personnel

Of the MTC's approximately 15,000 acres, 200 acres contain the cantonment area and over 14,000 acres consist of training lands. The MTC is generally square in shape, roughly 5.5 miles long from north to south, and about five miles wide from east to west.

The MTC provides facilities for a variety of units to perform live-fire exercises; small arms range firing; mortar, artillery, tank firing exercises; and maneuver training. Just over 14,000 acres are available for maneuver training, organized into 11 light maneuver areas and 43 heavy maneuver areas.

The SCARNG ranges include:

- The Combat Pistol Range is leased from Fort Jackson for use by the SCARNG, as well as local law enforcement agencies, for 9mm pistol qualification.
- Kassarine Pass is a nonstandard AT4 range that is leased from Fort Jackson. Only 9 mm training rounds are utilized for the AT4. Other weapons fired on the range include the Squad Assault Weapon (SAW) (5.56 mm) and the M203 (TPT only).
- Range 13 (25 Meter Zero) is leased from Fort Jackson and has 60 firing points for firing of M16 and M4 rifles.
- Range 14 (5.56 mm Qualification) is leased from Fort Jackson and has 16 firing lanes with targets ranging from 50 to 300 meters. The M16 and M4 are fired on the range.
- James C. Little (JCL) Tank Range is leased from Fort Jackson and is used for training of the M1A1 Tank and the Bradley Fighting Vehicle (BFV). The SCARNG conducts most of their 120 mm Tank gun firing at Fort Stewart, but approximately once per year, they will fire the main gun at MTC. The BFV is equipped with the 25-mm gun, the 7.62 mm machine gun, and TOW missiles. In 2002, the range was upgraded so Tank training can be accomplished up to Table VI and Tables VII and VIII can be conducted for the BFV.
- Indirect Firing Points
 - » The MTC has one mortar firing point and 17 artillery firing points which fire into the impact area. Weapons fired include the 155-mm self-propelled howitzer (Paladin), the Multiple Launch Rocket System (MLRS), and 120- mm mortars that are fired with 81-mm inserts.

• Grenade Activities

- » The SCARNG requires all soldiers to conduct hand grenade qualification and for some of these soldiers to be familiarized with live hand grenade annually. This training is conducted on Fort Jackson's Remagen Range.

• Engineering Activities

- » Demolition training is conducted at Fort Jackson's Impact Area Demo Site.

Current and Foreseeable Activities

The mission of the SCARNG is to deliver a fully capable level of military preparedness and response to protect the lives and property of the people of South Carolina during times of emergency. Units conduct small arms training year-round, firing the M16 rifle, M249 and M60 machine guns, M2 .50 cal machine, Squad Assault Weapon, Pistols 9mm/.45 cal, and 12- gauge shotgun. The SCARNG 3rd Battalion, 178th Field Artillery Unit fires the MLRS using the Reduced Range Practice Rocket that does not explode on impact, but releases a cloud of smoke to locate the impact point.

The MTC does not have airfield facilities or assigned aircraft. However, transient aircraft use the airspace above MTC for training purposes, generating some noise impacts on adjacent lands. The MTC has tactical vehicles, including noise-producing tracked vehicles, such as the M1A1 Tank and the Bradley Fighting Vehicle operating in Training Area (TA) 32, TA34B, and on the tank trails.

The MTC also includes a recently constructed military operations on urbanized terrain (MOUT) facility, which trains troops for combat in urban environments through the use of blank rifle firing and simulators. The MOUT is just north of the cantonment area.

The SCARNG's artillery capabilities have declined from a brigade (3,000 personnel) to a battalion (600 personnel) over the past several years. Currently, the 1st Battalion, 178th Field Artillery Unit is the only remaining Field Artillery unit in South Carolina. However, events overseas particularly in Afghanistan, may lead to a re-emphasis on the use of artillery, thus reinforcing the importance of live ordnance firing for the training artillery crews.

McEntire Joint National Guard Base

History

McEntire Joint National Guard Base (JNGB) is named for the late Brigadier General Bernie B. McEntire, Jr., the first commander of the South Carolina Air National Guard (SCANG) and its first general officer. The SCANG formed in December of 1946 and has deployed to five major combat operations in its history, including the Korean War, Operation Desert Shield/Storm, Operation Enduring Freedom, and Operation Iraqi Freedom.

The 169th Fighter Wing has flown more than 400 combat missions, performing the Suppression of Enemy Air Defenses mission and conducting precision bombing over Iraq, and was the first Air National Guard unit to deploy with the Air Expeditionary Force. Currently, members of the SCANG are deployed to Southwest Asia in support of US operations in the region.

Major Tenant Units

The 169th Fighter Wing is the primary unit of the SCANG. Wing units include the 169th Operations Group, 169th Maintenance Group, 169th Mission Support Group, and the 169th Medical Group.

Other units at McEntire JNGB include the 245th Air Traffic Control Squadron, which performs air traffic control at fixed air bases and remote sites, as well as home bases, and the Det 1, 20th Operations Group and Det 2, 20th Maintenance Operations Squadron.

Installation Facilities and Personnel

The 2,400-acre base is about 12 miles east of Columbia. The South Carolina Air National Guard currently consists of 1,210 personnel, including 94 Active Guard Reserve employees, 301 technicians, and 815 traditional guardsmen. Also at McEntire JNGB, the South Carolina ARNG has 243 full-time and 880 traditional personnel.

At 150 feet wide and 9,001 feet long, Runway 14/32 is the primary runway at McEntire JNGB, accommodating fixed-wing aircraft operations. Runway 05/23 is 90 feet wide and 2,008 feet long, and is the rotary-wing aircraft runway. Currently closed, Runway 18/36 is 150 feet wide and 4,503 feet long.

Current and Foreseeable Activities

The mission of the 169th Fighter Wing (FW) is to maintain wartime readiness and the ability to mobilize and deploy rapidly to carry out tactical air missions or combat support activities in the event of a war or military emergency. The SCANG operates as a fully integrated part of the active duty Air Force and also fulfills its state mission in remaining available to respond to domestic natural disasters or disturbances.

The 169th FW flies the F-16 Fighting Falcon, a single-seat multi-purpose fighter. The SCANG also flies one C-130 Hercules for airlift support. The base has 24 primary aircraft and 28 total airplanes. Base military aircraft types operating at McEntire JNGB consist primarily of the C-130H and F-16C fixed-wing aircraft and AH-64, CH-47D, OH-58A/C, and UH-60L rotary-wing aircraft.

As of October 2007, McEntire JNGB hosted approximately 30,000 annual aircraft operations. Data indicate that on average the base will have 110 busy-day aircraft operations. Units training at McEntire JNGB conduct significant nighttime operations with flights at night occurring two weeks per month.

As a result of the 2005 BRAC efforts, five additional F-16s arrived at the base in 2006. Overall, McEntire JNGB has seen an increase in the volume of aviation traffic from 4,500 hours annually to 6,500 hours by the summer of 2007. The F-16s are expected to continue operating at this heightened level.

The F-35 Joint Strike Fighter (JSF) aircraft are scheduled to arrive at the base by around 2015. The presence of the F-35s will not increase the number of people training at McEntire JNGB or significantly affect the physical dimensions of controlled airspace in which the aircraft navigate. The JSF, however, is louder than previous generations of aircraft.

2.5 Economic Impact

Current Economic Impact

Fort Jackson is a significant economic engine for the region. According to statistics for FY 2005, the installation circulated more than \$700 million throughout the area, including direct payroll, construction, and contracts (See Table 2.3).

Aside from the direct expenditures associated with salaries and contracts, military activity produces significant indirect economic impacts. Active duty and civilian employees, retirees, and dependents spend their paychecks on local goods and services, generating jobs in retail and other supporting sectors. Employers then hire more workers, who in turn make local purchases, further cycling dollars through the economic region. Fort Jackson also generates major visitor impacts as part of weekly Graduation and Family Days. Overall, the Greater Columbia chamber estimates Fort Jackson's economic impact at more than \$1.2 billion. Planned or ongoing construction activity to support BRAC will also spur regional economic activity with approximately \$800 million currently allotted for a dozen projects at Fort Jackson.

The SCARNG is also a major economic asset in the region, contributing almost \$300 million to the local communities in which Guard members live and train. Since the SCARNG facilities include the Eastover Army Aviation Support Facility, as well as MTC, some of these economic impacts are experienced outside of the Midlands region.

In FY 2007, total expenditures at McEntire JNGB were estimated at \$100,411,804, including \$62,029,992 in operations and maintenance and \$38,381,812 in payroll. South Carolina ARNG expenditures in FY 2007 were an additional \$34,897,933. The economic impact is expected to increase as the base adds tenant units and personnel.

EXPENDITURE	MILLIONS
Military Payroll	\$402.3
Civilian Payroll	\$118.2
Services (Including contractors)	\$108.7
Supplies/Equipment	\$74.7
Utilities	\$10.8
Travel/Transportation	\$7.9
Total Expenditures	\$722.6

Table 2.3: Total Economic Impacts of Fort Jackson, FY 2005

EXPENDITURES	MILLIONS
Military Pay	\$156.7
Civilian Pay	\$57.2
Goods and Services	\$76.1
Military Construction	\$4.9
Total Expenditures	\$295

Table 2.4: Total Economic Impacts of SCARNG, FY 2006

EXPENDITURES	ANG Millions	ARNG Millions
Employment	\$38.4	\$21.8
Construction	-	\$1.2
Operations and Maintenance	\$62	\$13.1
Total Expenditures	\$100.4	\$34.9

Table 2.5: Total Economic Impacts of McEntire, FY 2007

Economic Impact Projections

Summary

Ongoing military operations combined with BRAC-related growth and planned construction activity at Fort Jackson and McEntire JNGB will contribute significantly to the greater Columbia region over the ten year study period ending in 2018. The purpose of this section is to project the increased economic activity associated with foreseeable mission change at the installations; to estimate the demand of new military personnel on the regional housing market; and to quantify the value of hospitality service delivered to support the yearly flow of Fort Jackson visitors.

By 2018, the direct economic impacts will generate \$1.25 billion cumulatively in spending and earnings. The annual output beyond 2018 is projected to total \$63.3 million (Table 2.6). New direct employment opportunity levels are projected to range during the study period as a result of proposed construction activity and peak at 1,501 new jobs in 2014. However, 604 permanent employment opportunities are projected to remain after the construction activity is completed. The total economic impacts between 2009 and 2018 equate to more than \$2.25 billion in spending and output and 889 direct and indirect employment opportunities.

The increase in personnel at Fort Jackson as a result of the BRAC action likely will have very little impact on local and regional housing demand. At a basic level, the projected permanent employment growth translates into 406 new military and government personnel. Even if it assumed that all 406 new employees and their respective dependents will seek housing off post, the level of housing (both rental and ownership) within a 10-mile radius of the facility are more than adequate to accommodate this new demand. This finding would be different if the new trainee population (approximately 2,450 personnel) were to also seek housing off-post. However, it is not likely that many, if any, trainees will be allowed to live outside barracks facilities.

In addition, the housing analysis indicates that ownership and rental housing within the immediate Fort Jackson area is relatively affordable based on military households' ability to pay. The ability-to-pay for an E3 and a GS4 fall within the range of pricing for ownership and rental units presented in the following narrative. As such, no special accommodations are necessary to address the growth in new personnel.

The annual economic impact related to Fort Jackson graduation is between \$30.0 million and \$34.8 million. Approximately two-thirds of this spending total represents hotel revenues, with dining accounting for another 30 percent. With 42 graduations occurring in 2009, it is estimated that each graduation event generates between \$715,000 and \$830,000 of visitor spending in the Columbia metropolitan area. Over the ten year study period ending in 2018, the economic impact of Fort Jackson graduations is projected to account for approximately \$295.5 million and \$348.0 million with all factors remaining equal throughout.

Overall Economic Impact

Methodology

The analysis measured the direct and indirect economic impacts of the projected increase in personnel and proposed construction activity at Fort Jackson/McEntire JNGB. The analysis provides a deeper understanding of the potential benefits of this investment to the metropolitan Columbia region. To complete this analysis, the planning team used information provided by the Plans, Analysis and Information Office at Fort Jackson and the Bureau of Economic Analysis (BEA) Regional Input-Output Modeling System (RIMS II). More specifically, the Plans, Analysis and Information Office provided Base Realignment and Closure (BRAC) information on the number of new permanent personnel and the Short Range Plan from the Fort Jackson Directorate of Public Works.

The RIMS II method for estimating direct and indirect economic impacts relies heavily upon the existing relationships between industries operating within the study geography. For the purposes of this analysis, the planning team defined the study region as the Central Midlands Council of Governments boundary, as well as Kershaw and Sumter Counties. Including Kershaw and Sumter was necessary, as omitting these jurisdictions potentially would misrepresent the impact of the short-term growth plans.

Economic Impact Analysis

The analysis provides insight into the economic impact of the spending, earnings and employment gains directly related to growth at the facility. The planning team measured these gains in three distinct areas; [1] direct employment gains due to BRAC, [2] spending and employment gains due to the construction of new facilities on post, and [3] the increase in operation and maintenance spending and employment as a result of the new facilities.

The following narrative highlights the direct and indirect impacts for each category.

It is important to note that the planning team used the following assumptions to complete the economic impact analysis. Any variations from these assumptions are identified as necessary.

- The analysis presents the impacts of changes in economic activity at Fort Jackson.
- All calculations are presented in 2009 dollars, allowing a direct comparison of future values.
- All multipliers used to determine indirect economic impacts come from the Bureau of Economic Analysis RIMS II modeling system.
- All BRAC-related employment growth will be complete by the end of 2011.
- All construction projects are scheduled to take 24 months to complete from date identified in the Short Range Plan
- Operation & Maintenance calculations reflect annual costs incurred as a result of the new construction.
- Military wages were calculated utilizing current military and government salary ranges for the Columbia metropolitan area.
- All other wage rates were calculated using regional averages from the Bureau of Economic Analysis.

In-Coming BRAC Personnel

The Fort Jackson Plans, Analysis and Information Office provided BRAC-related growth estimates for permanent and trainee employment levels dated May 2009. According to this information, Fort Jackson is scheduled to receive 181 permanent party military personnel, 225 government civilian personnel and approximately 2,450 additional Army trainees by calendar year 2011. While the permanent party personnel likely will have a real impact on the regional economy, the trainees likely will make a limited contribution as a result of restricted opportunities to leave the post.

The 406 new permanent military and government civilians are projected to earn \$22.2 million in wages once established at Fort Jackson. The indirect impacts of this new employment and wages are projected to total 212 additional jobs with total earnings of approximately \$15.7 million in new wages. The impacts are strongest in professional services jobs and retail trade jobs.

Construction Impacts

The Fort Jackson Directorate of Public Works Short Range Plan has 38 different projects identified for construction over the next ten years totaling \$818.5 million in direct construction value. These construction projects directly affect the regional economy. Spending is strongest over the next six years, where an average of approximately \$110 million is projected to be spent annually during this time period. The spending is projected to slow slightly after 2014 to a pace of \$54.0 million ending by 2018.

Direct impacts from construction range by year as a result of the variations in construction activity. Annual employment levels range from 299 jobs in the last year of construction (2017) to 967 jobs in 2014. Employment is strongest in the first few years. Annual wage rates correspond to the employment levels, ranging from \$10.0 million to \$32.4 million. The total direct wages earned during the study period total \$210.1 million. Indirect economic output related to construction totals nearly \$1.5 billion in new spending (\$1.12 billion) and earnings (\$356.4 million), supporting between 531 jobs and 1,721 jobs during the study period.

It is important to note that construction spending, earnings and employment are not projected to extend beyond the study period, as all of the projects are scheduled to be completed by 2017. While some of this growth will continue due to the growth in economic activity related to the new buildings being developed, any substantial support for the growth in construction jobs and earnings will require additional construction work.

Operation and Maintenance Impacts

The changes in operation and maintenance economic activity are tied to the delivery of the new building projects on post. As new buildings and facilities are completed, the need for additional operations and maintenance spending increases. As such, the economic impact of the operation and maintenance output is cumulative and will continue after the study period ends.

The direct impacts of the operation and maintenance increase from \$5.4 million in total output and 26 new jobs in 2010 to \$41.0 million and 198 jobs by the completion of the 38 construction projects. The cumulative direct economic output during the study period totals \$230.6 million. Wages related to the new jobs equates to 30.6% of the total output. Indirect impacts from this spending and employment growth in operations and maintenance at Fort Jackson total

\$157.5 million in cumulative spending and earnings and 73 jobs by 2018. The annual indirect impacts are projected to equate to \$28.0 million annually beyond the study period once all construction projects are completed.

Summary of Findings

The projected growth at Fort Jackson/McEntire JNGB will have a substantial impact on the greater Columbia region. By 2018, the direct economic impacts will generate \$1.25 billion cumulatively in spending and earnings. The annual output beyond 2018 is projected to total \$63.3 million (Table 2.6). New direct employment opportunity levels are projected to range during the study period as a result of the construction activity and peak at 1,501 new jobs in 2014. However, 604 permanent employment opportunities are projected to remain after the construction activity is completed. The total economic impacts between 2009 and 2018 equate to more than \$2.25 billion in spending and output and 889 direct and indirect employment opportunities.

Regional Housing Market Impacts

The regional housing market analysis examines the supply of available housing and the affordability of area housing. Supply factors in the for-sale and for-rent housing markets are analyzed initially and followed by an affordability analysis, which provides an overview of housing demand based on military and government civilian incomes.

Housing Supply Analysis

Methodology

The housing supply analysis is focused on local areas identified as having the largest percentage of military employees commuting into Fort Jackson. In a recent study by the Central Midlands Council of Government, eleven zip codes within ten miles of Fort Jackson are shown to have high levels of military personnel. These zip codes provide the basis for the housing supply analysis as their proximity and concentrations of current post employees are factors that likely will attract the incoming population.

Data was collected for this analysis from multiple vendors. Information pertaining to for-sale housing availability and pricing was obtained through Realtor.com, an online inventory of real estate listings and trends administered by the National Association of Realtors. For-rent market information was collected through ApartmentGuide.com, an online database of apartment pricing and amenities by

locality. Additionally, for-rent vacancy data was obtained through REIS, a market data reporting service, and through interviews with local apartment complex representatives.

For-Sale Market Analysis

There is a large inventory of available housing within ten miles of Fort Jackson. In the eleven zip code areas within ten miles of the post with known military population, more than 3,500 housing units were actively listed as for-sale during the week ending September 9th (Table 2.7). This equates to approximately 2.6% of all units in these zip codes. These housing units include single-family dwellings, townhouses, condominiums and mobile homes. However, a substantial majority of these units are single-family units. The zip codes with the highest number of available units are 29223 (469 units) and 29229 (743 units). These zip codes provide immediate access to Fort Jackson as they are located along the northern edge of the post along Interstate 20. Additionally, there is another 1,400 units currently listed as for-sale in the ten other zip codes within ten miles of Fort Jackson.

The average asking price of the more than 3,500 housing units for sale in the eleven concentrated zip codes is \$178,550. However, the three zip codes with the largest number of listings each have average asking prices greater than the area average ranging from \$189,000 (zip code 29229: Columbia) to \$212,000 (zip code 29045: Elgin).

The available housing supply is likely to remain stable as housing units are experiencing slow sales rates. Based on recent sales in the focus zip codes, units are spending nearly five months on the market before they are sold or pulled off the market. This level of activity helps to ensure that housing units will be available for the increasing military population in the area.

For-Rent Market Analysis

The planning team identified 37 apartment complexes within ten miles of Fort Jackson. However, 22 of these offer military moving clauses and are deemed most desirable for the area military population. These 22 developments are the focus of this analysis.

Apartment units in complexes with military moving clauses are readily available close to Fort Jackson. According to interviews with complex representatives, it was reported that an average of 22 percent of units are currently vacant. This figure is higher than the 13 percent apartment vacancy rate for the second quarter of 2009 in the Columbia

ECONOMIC IMPACT OF GROWTH: FORT JACKSON, SOUTH CAROLINA												
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Totals	
OUTPUT												
Construction	\$80,513,290	\$92,224,990	\$71,608,680	\$74,471,540	\$76,311,950	\$93,972,450	\$49,263,500	\$42,013,400	\$29,000,400	\$0	\$609,380,200	
Operations & Maintenance	\$0	\$3,758,225	\$8,063,133	\$11,405,706	\$14,881,913	\$18,444,026	\$22,830,503	\$25,130,040	\$27,091,055	\$28,444,845	\$160,049,546	
Total Direct Output	\$80,513,290	\$95,983,215	\$79,671,813	\$85,877,246	\$91,193,863	\$112,416,476	\$72,094,003	\$67,143,440	\$56,091,555	\$28,444,845	\$769,429,746	
Indirect Output Impact	\$67,309,110	\$79,915,002	\$65,904,143	\$70,801,081	\$74,943,343	\$92,375,544	\$58,284,332	\$53,945,602	\$44,535,609	\$21,305,189	\$629,318,957	
EMPLOYMENT												
Permanent Military	60	120	181	181	181	181	181	181	181	181	181	181
Permanent Civilian	75	150	225	225	225	225	225	225	225	225	225	225
Construction	829	949	737	767	785	967	507	432	299	0	0	0
Operation & Maintenance	0	26	56	79	103	128	159	174	188	198	198	198
Total Direct Employment	964	1,245	1,199	1,252	1,295	1,501	1,072	1,013	893	604	604	604
Indirect Emp. Impact	716	890	807	838	862	1,013	666	613	514	285	285	285
EARNINGS												
Permanent Military	\$2,832,000	\$5,664,000	\$8,543,200	\$8,543,200	\$8,543,200	\$8,543,200	\$8,543,200	\$8,543,200	\$8,543,200	\$8,543,200	\$76,841,600	
Permanent Civilian	\$4,586,314	\$9,172,629	\$13,758,943	\$13,758,943	\$13,758,943	\$13,758,943	\$13,758,943	\$13,758,943	\$13,758,943	\$13,758,943	\$123,830,490	
Construction	\$27,761,710	\$31,800,010	\$24,691,320	\$25,678,460	\$26,313,050	\$32,402,550	\$16,986,500	\$14,846,600	\$9,999,600	\$0	\$210,119,800	
Operation & Maintenance	\$0	\$1,655,525	\$3,551,867	\$5,024,294	\$6,555,588	\$8,124,724	\$10,056,998	\$11,069,960	\$11,933,845	\$12,530,155	\$70,502,955	
Total Direct Earnings	\$35,180,024	\$48,292,164	\$50,545,330	\$53,004,897	\$55,170,781	\$62,829,417	\$49,345,641	\$47,858,703	\$44,235,588	\$34,832,298	\$481,294,844	
Indirect Earnings Impact	\$24,537,225	\$33,447,007	\$34,760,262	\$36,233,588	\$37,492,973	\$42,569,184	\$32,871,447	\$31,672,439	\$29,010,802	\$22,369,510	\$324,964,438	
TOTAL ECONOMIC IMPACTS												
Output	\$147,822,400	\$175,898,218	\$145,575,956	\$156,678,327	\$166,137,205	\$204,792,020	\$130,378,335	\$121,089,042	\$100,627,164	\$49,750,034	\$1,398,748,702	
Employment	1,680	2,135	2,006	2,090	2,157	2,514	1,737	1,626	1,407	889	889	
Earnings	\$59,717,250	\$81,739,171	\$85,305,593	\$89,238,485	\$92,663,754	\$105,398,601	\$82,217,088	\$79,531,142	\$73,246,390	\$58,201,808	\$806,259,282	

Table 2.6: Projected Growth Impacts (Source: Bureau of Economic Analysis, DemographicsNow, Fort Jackson Plans, Analysis and Information Office and RKG Assoc.)

AVAILABLE FOR-SALE HOUSING SUPPLY: ZIP CODES WITHIN 10-MILE RADIUS OF FORT JACKSON						
Zip Code	Post Office Name	Avg List Price	Avg DOM	Active Listings	Avg Sale Price	Listings/Total Unit Ratio
29045	Elgin	\$212,185	154	405	\$236,371	4.8%
29061	Hopkins	\$115,297	105	100	\$101,746	1.8%
29078	Lugoff	\$120,483	126	298	N/A	5.0%
29169	West Columbia	\$206,910	227	185	\$120,620	1.7%
29203	Columbia	\$81,836	163	327	\$63,675	1.9%
29204	Columbia	\$183,225	142	156	\$124,185	1.6%
29206	Columbia	\$312,991	146	199	\$205,994	2.2%
29209	Columbia	\$202,276	146	340	\$147,093	2.5%
29210	Columbia	\$106,377	146	293	\$97,513	1.6%
29223	Columbia	\$209,076	161	469	\$165,505	2.1%
29229	Columbia	\$188,868	143	743	\$147,384	5.3%

Table 2.7: Housing Supply in 10-Mile Radius (Source: Realtor.com, Central Midlands Council of Governments, RKG Assoc.

metropolitan area as reported by REIS. It should also be mentioned that one of the local apartment complexes is undergoing an expansion that is expected to add 700 units to the supply.

Most of the identified apartment complexes have one, two and three-bedroom units. The median rates for these units are \$663, \$773, and \$957, respectively (Table 2.8). It is shown in the following section that these rent rates are well within the housing stipends provided to both military officers and enlisted personnel.

Affordability Analysis

The planning team performed a detailed housing affordability analysis for the incoming military and government personnel. The analysis collected the earnings data for both groups from the Office of the Undersecretary of Defense for Personnel and Readiness (military) and the U.S. Office of Personnel Management (government), respectively. While the planning team could not obtain a breakout of the new in-coming personnel by rank/pay grade, analyzing the each of the rank/pay levels

provides the range of ability to pay for new personnel, whether they intend to rent or own.

Table 2.9 presents how the planning team calculated ability to pay for both renter households and ownership households within the government and military groups.

Within the homeownership category, the analysis estimated the “high-end” and “low-end” home prices by assuming that the purchasing pool of households falls into two distinct buying classes. The categories are labeled; [1] FHA/VA First Homebuyers and [2] Conventional Homebuyers. The FHA/VA Homebuyer group includes all households that do not have the traditional 20 percent down-payment, and is assumed to require the use of a Federal Housing Administration (FHA) mortgage. This group is assumed to only have a 3.5 percent down payment, requiring them to follow FHA guidelines and pay primary mortgage insurance (PMI). The second group includes all households under the assumption that they have the requisite 20 percent downpayment available through savings or existing home equity to qualify for a conventional mortgage. Using current mortgage, Private Mortgage Insurance (PMI), insurance and real property tax rates, the planning team was able to generate the corresponding value of home that an FHA and conventional homebuyer would be able to afford.

The analysis utilized the following assumptions to determine the relative affordability band for households to pay within the framework identified Table 2.9.

- All buyers seek to maximize their spending potential

MONTHLY APARTMENT RENT RATES: COMPLEXES WITHIN A 10-MILE RADIUS FROM FORT JACKSON			
	Pricing Range		Median Rent
	Lowest Rent	Highest Rent	
1-Bedroom Unit	\$440	\$950	\$663
2-Bedroom Unit	\$575	\$1,250	\$773
3-Bedroom Unit	\$675	\$1,595	\$957

Table 2.8 Apartment Rent Rates (Source: Apartment.com, RKG)

HOUSING AFFORDABILITY COMPARISON FOR MILITARY AND GOVERNMENT PERSONNEL		
	Military	Government
Renting	Use of Basic Allowance for Subsistence (BAS) and Basic Allowance for Housing (BAH) to pay rent	Use of 28% of gross income for housing payment
Homeownership	Use of BAS and BAH to pay mortgage (principal, interest, taxes and insurance, or PITI)	Use of 28% (FHA) or 35% (conventional) of gross income to pay mortgage (PITI)

Table 2.9: Housing Affordability Comparison

(based on income and equity position).

- Affordability levels were determined based on the income levels/allowance levels provided by OPM and the Office of the Undersecretary of Defense for Personnel and Readiness.
- Interest rates were collected from local lending institutions at the time of this analysis (September 2009).
- The FHA-style mortgages require PMI, which was calculated using current (as of September 2009) rates.
- Insurance rates were calculated using estimates provided by national insurance companies for the Primary Study Region in Columbia.
- The Consultant used a debt-to-income ratio of 35% to calculate income requirements for a new conventional mortgage to simulate the principal, interest, taxes and insurance (PITI) payment and an assumed level of monthly debt payments. FHA buyers were held to a 28% ratio.

Military Personnel

The ability of military households to pay for housing varies by rank. In terms of rental housing, military households without dependents can afford between \$847 (E3 rank) and 1,737 per month (BG and above) without including the basic allowance for sustenance (Table 2.10). With this total, the affordability band increases to \$1,170 and \$1,960 per month, respectively. Households with dependents are allotted a greater housing allowance, thus increasing their ability to pay by anywhere from \$270 to \$380 extra per month.

For homeownership, the affordability band is influenced by both military rank (and therefore BAH and BAS pay) as well as current ownership status. Simply put, households that are coming from an ownership position and can produce the 20 percent downpayment can purchase a more expensive home. FHA buyers with no dependents can afford between \$159,442 and \$267,100 for a home. In contrast, a conventional buyer with dependents can afford a home between \$239,693 and \$381,100. It is important to note that the ownership affordability levels decrease if BAS is not included as potential income to pay for the mortgage. However, it is the planning team's experience that military households seeking to purchase homes are willing to use this income stream to purchase a larger home, if necessary.

Government/Civilian Personnel

As mentioned, the analysis calculated government employees' ability to pay differently than military personnel. Government workers are not afforded a BAS or BAH, and must acquire housing based on their salary. As such, the planning team utilized the civilian pay grade scale for government personnel in the Columbia, South Carolina region. In an effort to provide a range of incomes, the analysis measured housing affordability for Step 5 employees and Step 10 employees. Similar to the military affordability analysis, a range of values were determined as if all new personnel are FHA buyers and as if all are conventional purchasers.

Government employees on Step 5 have the ability to pay between \$727 (GS4) and \$2,955 (GS15) for rental housing. Those personnel at the higher Step 10 level can pay between \$834 and \$3,390 monthly (Table 2.11). For homeownership, those households at Step 5 and requiring an FHA loan have an affordability range between \$99,050 and \$402,500. Affordability levels increase substantially for those households at Step 10 and able to qualify for a conventional mortgage, ranging from \$172,133 and \$699,500. Although not shown in Table 2.11, personnel at lower steps within the same pay grade would have a slightly lower ability to pay.

Housing Impact Assessment

The increase in personnel at Fort Jackson as a result of the BRAC action likely will have very little impact on the local and regional housing market analysis. At a basic level, the projected permanent employment growth translates into 406 new military and government personnel. Even if it

HOUSING AFFORDABILITY FOR MILITARY PERSONNEL: FORT JACKSON, SOUTH CAROLINA							
Personnel	BAS	BAH W/O Dependents	BAH With Dependents	FHA Buyers		Conventional	
				W/O Deps.	With Deps.	W/O Deps.	With Deps.
Military By Grade							
LTG (2)	\$223	\$1,737	\$2,085	\$267,100	\$314,400	\$323,600	\$381,000
MG	\$223	\$1,737	\$2,085	\$267,100	\$314,400	\$323,600	\$381,000
BG	\$223	\$1,737	\$2,085	\$267,100	\$314,400	\$323,600	\$381,000
O6	\$223	\$1,703	\$2,061	\$262,467	\$311,131	\$317,987	\$377,038
O5	\$223	\$1,624	\$2,044	\$251,701	\$308,815	\$304,943	\$374,232
O4	\$223	\$1,572	\$1,902	\$244,615	\$289,471	\$296,358	\$350,791
O3	\$223	\$1,414	\$1,699	\$223,083	\$261,818	\$270,272	\$317,280
O2	\$223	\$1,230	\$1,482	\$198,008	\$232,258	\$239,893	\$281,458
W5	\$323	\$1,583	\$1,865	\$259,741	\$298,053	\$314,684	\$361,191
W4	\$323	\$1,506	\$1,778	\$249,248	\$286,202	\$301,972	\$346,829
W3	\$323	\$1,392	\$1,703	\$233,713	\$275,985	\$283,150	\$334,448
W2	\$323	\$1,322	\$1,599	\$224,173	\$261,818	\$271,593	\$317,280
E9	\$323	\$1,386	\$1,757	\$232,895	\$283,341	\$282,159	\$343,362
E8	\$323	\$1,323	\$1,659	\$224,309	\$269,992	\$271,758	\$327,185
E7	\$323	\$1,173	\$1,564	\$203,868	\$257,051	\$246,993	\$311,502
E6	\$323	\$1,115	\$1,487	\$195,964	\$246,562	\$237,417	\$298,791
E5	\$323	\$962	\$1,283	\$175,114	\$218,772	\$212,156	\$265,115
E4	\$323	\$847	\$1,129	\$159,442	\$197,794	\$193,169	\$239,693
E3	\$323	\$847	\$1,129	\$159,442	\$197,794	\$193,169	\$239,693

Table 2.10: Housing Affordability - Military. (Source: Office of the Under Secretary of Defense and RKG Assoc.)

HOUSING AFFORDABILITY FOR GOVERNMENT CIVILIAN PERSONNEL: FORT JACKSON, SOUTH CAROLINA								
Personnel	Step 5	Step 10	Rental Thresholds		FHA Buyers		Conventional Buyers	
			Step 5	Step 10	Step 5	Step 10	Step 5	Step 10
Civilian By Grade								
GS 15	\$126,662	\$145,290	\$2,955	\$3,390	\$402,500	\$462,000	\$610,000	\$699,500
GS 14	\$107,681	\$123,519	\$2,513	\$2,882	\$342,183	\$392,772	\$518,588	\$594,683
GS 13	\$91,123	\$104,525	\$2,126	\$2,439	\$289,556	\$332,374	\$438,845	\$503,237
GS 12	\$76,627	\$87,893	\$1,788	\$2,051	\$243,501	\$279,486	\$369,033	\$423,162
GS 11	\$63,930	\$73,329	\$1,490	\$1,711	\$203,153	\$233,175	\$307,885	\$353,043
GS 10	\$58,190	\$66,747	\$1,358	\$1,557	\$184,913	\$212,245	\$280,241	\$321,354
GS 9	\$52,841	\$60,612	\$1,233	\$1,414	\$167,915	\$192,737	\$254,481	\$291,817
GS 8	\$47,843	\$54,879	\$1,116	\$1,281	\$152,033	\$174,507	\$230,410	\$264,215
GS 7	\$43,200	\$49,553	\$1,008	\$1,156	\$137,279	\$157,571	\$208,050	\$238,573
GS 6	\$38,873	\$44,589	\$907	\$1,040	\$123,529	\$141,786	\$187,211	\$214,674
GS 5	\$34,875	\$40,005	\$814	\$903	\$110,824	\$127,210	\$167,957	\$192,604
GS 4	\$31,170	\$35,753	\$727	\$834	\$99,050	\$113,689	\$150,114	\$172,133

Table 2.11: Housing Affordability - Civilian. (Source: Office of Personnel Management and RKG Assoc.)

assumed that all 406 new employees and their respective households will seek housing off post, the level of housing (both rental and ownership) within a 10-mile radius of the facility are more than adequate to accommodate this new demand. This finding would be different if the new trainee population (approximately 2,450 personnel) were to also seek housing off-post. However, it is not likely that many, if any, trainees will be allowed to seek off-post housing.

In addition, the housing market analysis indicates that ownership and rental housing within the immediate Fort Jackson area is relatively affordable based on these households' ability to pay. The ability to pay for an E3 and a GS 4 fall within the range of pricing for ownership and rental units presented in Tables 2.7 and 2.8. As such, no special accommodations are necessary to address the growth in new personnel.

Hospitality Impacts due to Fort Jackson Graduation Activity

The many Fort Jackson graduations each year provide a substantial economic impact to the Columbia metropolitan area. Hundreds of thousands of family members and friends come to Columbia to witness their Soldier's graduation and spend money at local establishments such as hotels, eateries, gasoline stations and convenience stores during their stay. This analysis provides insight into the impacts that this spending has in the local economy by examining the magnitude associated with typical visitor spending patterns.

Methodology

This analysis is based on publicly available information regarding graduation visitors, online research and the planning team's professional judgments. In the instance when information was not readily accessible, the planning team provided estimates based on anecdotal observations and previous experience in similar BRAC economic impact studies. The spending figures generated in this analysis are largely reflective of information provided by the Plans, Analysis and Integration Office at Fort Jackson regarding graduation attendance trends. Using these figures, the analysis was then able to estimate overall spending patterns of this visiting population.

The standard spending impacts analyzed are representative of items and services on which a typical short-term traveler spends money. The greatest expenditures include hotel stays, dining, gasoline, and convenience goods or general retail purchases. To better understand the costs associated with each area, data was obtained through multiple resources. First, the planning team recorded the range of standard room rates for each hotel within five miles of Fort Jackson and applied the median rate to the number of room nights used by groups of graduation visitors. These rate ranges were collected using Military-Hotels.us, an online provider of information pertaining to all lodging options near U.S. Military bases. Next, the analysis utilized cost estimates for dining provided by the Urban Land Institute (ULI), a non-profit organization focused on disseminating research and education for the global real estate community. These figures were applied to the estimated number of groups staying in the area. Lastly, costs associated with gasoline and convenience goods were determined. As direct information pertaining to quantity of gasoline consumed

per visiting group and necessary items needed by these groups is not officially tracked by any organization, the planning team provides estimates and ranges based on its professional experience.

It is important to note that the results of this analysis should be used as a general guideline for understanding hospitality impacts related to Fort Jackson graduations. The analysis provides a range for estimated impacts as the preferences of visiting groups and their budgetary limits remain unrecorded by any organization. The range of the total economic impact provided in the analysis is defined by a low-end, moderate-end, and high-end in an attempt to clearly define the depth and breadth of the spending patterns of graduation visitors.

Visitor Spending Estimates

The spending calculations in the following sections are reflective of Fort Jackson's estimate that roughly 200,000 visitors attend military graduations at the installation each year. The Plans, Analysis and Integration Office at Fort Jackson states that 150,000 of these visitors are for Basic Combat Training (BCT) graduates, while the other 50,000 are for Advanced Individual Training (AIT) graduates. In addition, it is stated that the average group size attending the ceremonies is three persons, resulting in approximately 67,000 visiting groups. These figures greatly inform the results provided in the following sections.

Hotel Impacts

Every Fort Jackson graduation consists of two events on two consecutive mornings; [1] 'Family Day,' in which visitors are able to spend time with the Soldier(s) and [2] the actual graduation ceremony held the following morning. According to area travel representatives, this schedule ensures that most, if not all, visiting groups attend both events and are likely to stay a minimum of one night. Anecdotal information indicates that it is commonplace for a visiting group or family to arrive the day before 'Family Day' and leave either after graduation or the following morning. With 42 graduations taking place in 2009, it is estimated that approximately 236,000 to 262,000 hotel room nights are demanded annually because of these events. The analysis estimates that approximately \$20.1 million to \$22.3 million is spent on lodging by graduation visitors, which reflects the median area hotel room rate (\$85/night) and the annual number of room nights used.

Dining Impacts

Travelers almost exclusively dine out when away from home. The analysis utilized Urban Land Institute estimates of costs per meal (adjusted for inflation) against the number of meals likely consumed by graduation visitors. According to ULI estimates for dining costs and the planning team's previous experience, it is reasonable to estimate the average amount spent on breakfast, lunch and dinner by visitors is \$5.50, \$10 and \$19, respectively. The analysis resulted in an estimate ranging between \$45.00 and \$53.50 per visitor. When applied to the Fort Jackson estimate for visitors of 200,000, this results in dining expenditures ranging from \$9.0 million to 10.7 million annually.

Gasoline Purchase Impacts

The economic impact of purchases made on gasoline varies as a result of the impact of multiple travel preference factors. For instance, the number of travelers driving to graduation ceremonies as compared to flying is wholly dependent on where the trainees from a given year call home. Furthermore, it was noted by local travel professionals that many visitors utilize the airport in Charlotte, North Carolina and drive into Columbia as a result of the variations in airfare. As such, those flying into Charlotte will choose to refuel near that airport as opposed to those that fly in and out of Columbia.

However, none of the local visitor and travel assistance operations have tracked these data. To this end, the estimated impact of gasoline purchases is largely speculative based on anecdotal input from local travel and tourism professionals, likely ranging from \$312,500 to \$625,000 each year. While this range is comparatively wider, in terms of percentage split, than other estimates, it reflects the lower certainty of information available at the time of this analysis.

Convenience/General Retail Impacts

Like gasoline purchases, revenue generated through convenience goods and general retail items can fluctuate depending on the needs of individual visitors. The analysis again provides a range estimate, which accounts for varying levels of spending activity. Based on experience in similar studies, it is estimated that the revenue gained from convenience and general retail goods during graduations account for \$583,000 to \$1.2 million annually.

Summary of Findings

The planning team estimates that the annual economic impact relating to Fort Jackson graduation is between \$30.0 million and \$34.8 million (Table 2.12). Approximately two-thirds of this spending total represents hotel revenues, with dining accounting for another 30 percent. With 42 graduations occurring in 2009, it is estimated that each graduation event attracts between \$715,000 and \$830,000 of visitor spending into the Columbia metropolitan area. Over the ten year study period ending in 2018, the economic impact of Fort Jackson graduations is projected to account for approximately \$295.5 million and \$348.0 million with all factors remaining equal throughout.

ANNUAL ECONOMIC IMPACT OF FORT JACKSON GRADUATIONS: 2009 ESTIMATE			
Expenditures	Low-End	Moderate	High-End
Lodging	\$20,060,000	\$21,165,000	\$22,270,000
Dining	\$9,000,000	\$9,850,000	\$10,700,000
Gasoline	\$312,500	\$468,750	\$625,000
Convenience Goods	\$583,000	\$891,500	\$1,200,000
Total	\$29,955,500	\$32,375,250	\$34,795,000

Table 2.12: Annual Economic Impact of Graduation Visitors

2.6 Regional Demographics and Growth Trends

Regional Demographics

Richland County

According to Regional Population Projections 2005 – 2035 produced by the Central Midlands Council of Governments (CMCOG) in 2007, Richland County will grow from 320,677 residents in 2000 to 451,470 by 2035. The following planning sectors from the CMCOG report have direct adjacency with Fort Jackson/MTC and McEntire JNGB. Table 2.13 and Figure 2.2 show population change over the next 25 years in potentially affected planning sectors and census tracts.

Richland Northeast

The area north of Fort Jackson in the Richland Northeast planning sector will remain one of the fastest growing parts of the Central Midlands region, due to its good schools, available land near I-20 and the planned extension of sewer service by the City of Columbia and Richland County. Overall, CMCOG data indicate a substantial increase of 78 percent in the residential base from 2000 to 2035, as the area absorbs an additional 42,172 residents.

Southeast Richland

Through 2035, the population of the Southeast Richland planning sector between Fort Jackson/MTC and McEntire JNGB should continue to grow rapidly as suburban development spreads eastward. The area has fewer development constraints in the form of wetlands and floodplains than other parts of south Richland County, making it more susceptible to growth pressures. Rural road improvements proposed in Lower Richland County will fuel this emerging growth trend. CMCOG projections indicate a growth rate of 75 percent over the year 2000 as the sector adds 8,604 residents by 2035.

Hopkins

The Hopkins planning sector farther to the south and surrounding McEntire JNGB has more limited development potential overall than Southeast Richland, a function of land protection in the Congaree National Park. Nonetheless, the extension of public water and sewer service within the planning area will support an increasing residential base. The CMCOG report projects growth of 50 percent or 3,383 more residents in 2035 over the 2000 population.

East Richland

Given significant environmental constraints associated with wetlands and floodplains around the Wateree River and its tributaries, as well as existing county future land use policy, growth prospects for the East Richland planning sector are moderate. The CMCOG report projects growth of 50 percent or 2,789 more people by 2035 relative to 2000.

Kershaw County

The Elgin Census County Division (CDC), which is northeast of Fort Jackson, has seen the most robust growth in the previous three decades of any CDC in Kershaw County due to its economic ties to the City of Columbia and access from I-20. (See Table 2.14).

Growth Trends

A review of population projections, recent development activity and building permit data, along with stakeholder interviews indicate that the following current growth areas are in proximity to training impacts:

- To the north and northeast of Fort Jackson/MTC, particularly along Percival Road and in the Spears Creek area; and
- Between Highway 76 and the southern boundary of Fort Jackson, especially along Leesburg Road (South Carolina Highway 262) from Weston Lake to Semmes Road

Proposed infrastructure improvements also highlight a third foreseeable growth area between the eastern wastewater service area boundary of the City of Columbia and the western boundary of McEntire JNGB, particularly along Cabin Creek Road and Congaree Road.

Richland County

Northeast Richland continues to be one of the most rapidly growing portions of the county. The predominant existing land use between I-20 and Percival Road (SC 12) is single family detached housing, typically at a density of about eight dwelling units per acre. Nearby subdivisions include Woodcreek Farms, which has remaining undeveloped parcels, and Royal Pines Estates. Clemson Road has also experienced significant development of available lots. The Richland School District 2 has recently purchased approximately 40 acres of land between Percival Road and I-20 north of Fort Jackson. The presence of future schools, particularly in a district with a strong academic reputation can act as a significant catalyst for nearby residential growth. The proximity of nearby industrial employment and

new commercial development on lands formerly belonging to the Clemson Experimental Station will further reinforce the residential attractiveness of the area.

Much of the future growth in Richland County around the installations is anticipated on land between US 76 and Fort Jackson's southern boundary. A series of proposed rural road improvements and a Utility Master Plan from the City of Columbia that includes this area could spark denser patterns of development in the future.

Lower/Southeast Richland County is very attractive for future development because of its proximity to the City of Columbia and the amount of undeveloped land. The 10-year annexation boundary of Columbia is anticipated to extend to Mill Creek between Bluff Road and Garners Ferry Road and to Lower Richland Boulevard between Garners Ferry Road and Leesburg Road. The resulting spread of suburban growth eastward thus continues to be the most significant trend posing a potential threat to current mission capabilities. Development proposed in the vicinity of Lower

Richland High School west of McEntire JNGB totals about 2,025 housing units. The area generally lacks water and sewer infrastructure to support additional residential and commercial activity. However, both the city and county are exploring expanded delivery options. The City of Columbia is likely to deliver utility service for units north of the CSX rail line, while Richland County will serve housing south of the rail corridor through the planned Hopkins community water distribution system. As indicated below, a proposed wastewater line connecting to the Eastover Wastewater Treatment Plant (WWTP) could anchor substantial growth in this area. Figure 2.3 displays building permit activity in the study area as of mid-2008.

Kershaw County

Development permit activity in Kershaw County to the north-east of the post remains relatively low. Current zoning as described below and the lack of wastewater treatment in the area limit development potential in the foreseeable future. However, there are tentative plans

POPULATION CHANGE IN RICHLAND COUNTY										
Southeast - Richland										
Census Tract	2000	2005	2010	2015	2020	2025	2030	2035	% Change 00-35	Difference 00-35
119.01	6,562	6,850	7,683	8,516	9,349	10,182	11,015	11,848	80.6%	5,286
119.02	4,877	5,295	5,778	6,262	6,745	7,228	7,712	8,195	68.0%	3,318
Hopkins										
Census Tract	2000	2005	2010	2015	2020	2025	2030	2035	% Change 00-35	Difference 00-35
118	6,821	7,554	7,996	8,437	8,879	9,321	9,762	10,204	49.6%	3,383
East Richland										
Census Tract	2000	2005	2010	2015	2020	2025	2030	2035	% Change 00-35	Difference 00-35
120	5,598	6,257	6,612	6,967	7,322	7,677	8,032	8,387	49.8%	2,789
Northeast - Richland										
Census Tract	2000	2005	2010	2015	2020	2025	2030	2035	% Change 00-35	Difference 00-35
114.03	7,354	7,742	7,888	8,034	8,180	8,325	8,471	8,617	17.2%	1,263
114.04	6,585	7,483	7,643	7,804	7,964	8,124	8,285	8,445	28.2%	1,860
114.07	943	1,694	2,187	2,679	3,172	3,665	4,157	4,650	393.1%	3,707
114.08	10,329	11,929	12,114	12,299	12,484	12,669	12,854	13,039	26.2%	2,710
114.09	11,141	20,951	22,512	24,073	25,634	27,194	28,755	30,316	172.1%	19,175
114.10	7,620	10,121	10,614	11,106	11,599	12,092	12,584	13,077	71.6%	5,457
Total	43,972	59,920	62,958	65,995	69,033	72,069	75,106	78,144	77.7%	34,172

Table 2.13: 2000-2035 Population Change by Sector and Tract in Richland County

for a large subdivision along SC-12 outside of the JLUS study area. Combined with strengthening economic ties to Columbia and the planned widening of Percival Road in the COATS LRTP, such pockets of growth could support a pattern of increasing residential density in what has been to date a predominantly rural landscape.

Infrastructure Issues

Infrastructure, particularly roads and wastewater treatment, strongly influence private property investment decisions and thus overall land use patterns within a region. System extensions enable development in previously rural areas

POPULATION CHANGE IN KERSHAW COUNTY					
CDC	2000	2010	2020	% Change 00-20	Diff. 00-20
Bethune	2,423	2,550	2,700	11.4%	277
Boykin	2,766	3,500	4,220	52.6%	1,454
Camden/CNE	20,782	22,200	26,400	27.0%	5,618
Elgin	21,908	29,726	36,874	68.3%	14,966
Mt. Pisgah	2,420	2,700	2,831	17.0%	411
Westville	2,350	2,900	3,600	53.2%	1,250
Kershaw County	52,649	63,576	76,625	45.5%	23,976

Table 2.14: 2000-2020 Population Change by CDC in Kershaw Co.

and increased capacities can accommodate bigger scale uses. The tendency of growth to spread to rural/agricultural areas at higher intensities is often the primary factor driving land use conflicts around military installations. Figure 2.4 shows proposed infrastructure improvements that could re-shape development patterns in the study area.

Transportation

Traffic associated with weekly Graduation and Family Days on Fort Jackson, as well as enhanced security measures associated with post-9/11 entry procedures can cause vehicular delays on the local road network, particularly on Forest Drive and around Exits 10 and 12 off of I-77. Community and military planners are exploring several options to alleviate congestion, including opening an old gate associated with a relocated Visitor's Center, establishing a park-n-ride shuttle system, and/or designating a separate contractors' entry gate to the post.

Several transportation improvement projects could induce denser development patterns south of Fort Jackson, such as the proposed widening of Leesburg Road, Pineview Road and Air Base Road, and the project to extend Shop Road to Garners Ferry Road (US 76). Transportation planners have also proposed the expansion of Spears Creek Church Road. Prioritized highway widening segments from the COATS 2035 Long Range Transportation Plan that could affect land uses adjacent to Fort Jackson/MTC and McEntire JNGB include:

- Two Notch Road: Spears Creek Church Road to Steve Campbell Road
- Leesburg Road: Fairmont Drive to Lower Richland Boulevard
- Percival Road: I-77 Exit 15 to Smallwood Road
- Clemson Road: Two Notch Road to Sparkleberry Lane
- Percival Road: Spears Creek Church Road to Highway Church Road South
- Spears Creek Church Road: I-20 Exit 82 to Two Notch Road
- Percival Road: Smallwood Road to Spears Creek Church Road
- Leesburg Road: Lower Richland Blvd to Harmon Road
- Leesburg Road: Harmon Road to McCords Ferry Road

Wastewater

The proposed wastewater line in the Hopkins area is the project with the greatest potential to affect future development patterns in proximity to training and readiness operations. Richland County evaluated two options for serving several planned developments near Lower Richland High School, addressing environmental issues in Hopkins, and assisting McEntire JNGB with the elimination of the base's WWTP: a stand-alone WWTP in Hopkins or construction of a force main to connect to the existing WWTP in Eastover. The second option was the more economically feasible project. The planned 12" force main would run along Cabin Creek Road eastward and connect to an existing line near Webber Elementary School. A 16,400 linear-foot proposed force main from McEntire JNGB would tie into the Hopkins force main approximately 1.75 miles south of the base. Once main force design is further underway, McEntire JNGB will explore options for the collection of base wastewater with Richland County.

Richland County is negotiating with the City of Columbia to assume wastewater treatment service for Hopkins on an interim basis (approximately three years), while the county

constructs the new line. The Eastover WWTP is currently permitted to treat 0.75 million of gallons per day (MGD) with an ultimate capacity of 1 MGD. New units near Lower Richland High School would require an upgrade to 2 MGD at the facility.

Also in the Hopkins community, an underground storage tank spill contaminated approximately 50 private wells, necessitating current treatment of the water by the South Carolina Department of Health and Environmental Control. Richland County will build a community water supply system by linking wells at Hopkins Elementary and Hopkins Middle Schools and constructing a water distribution system for the schools and about 600 homes. The design is 90 percent complete with construction scheduled to end in 2009.

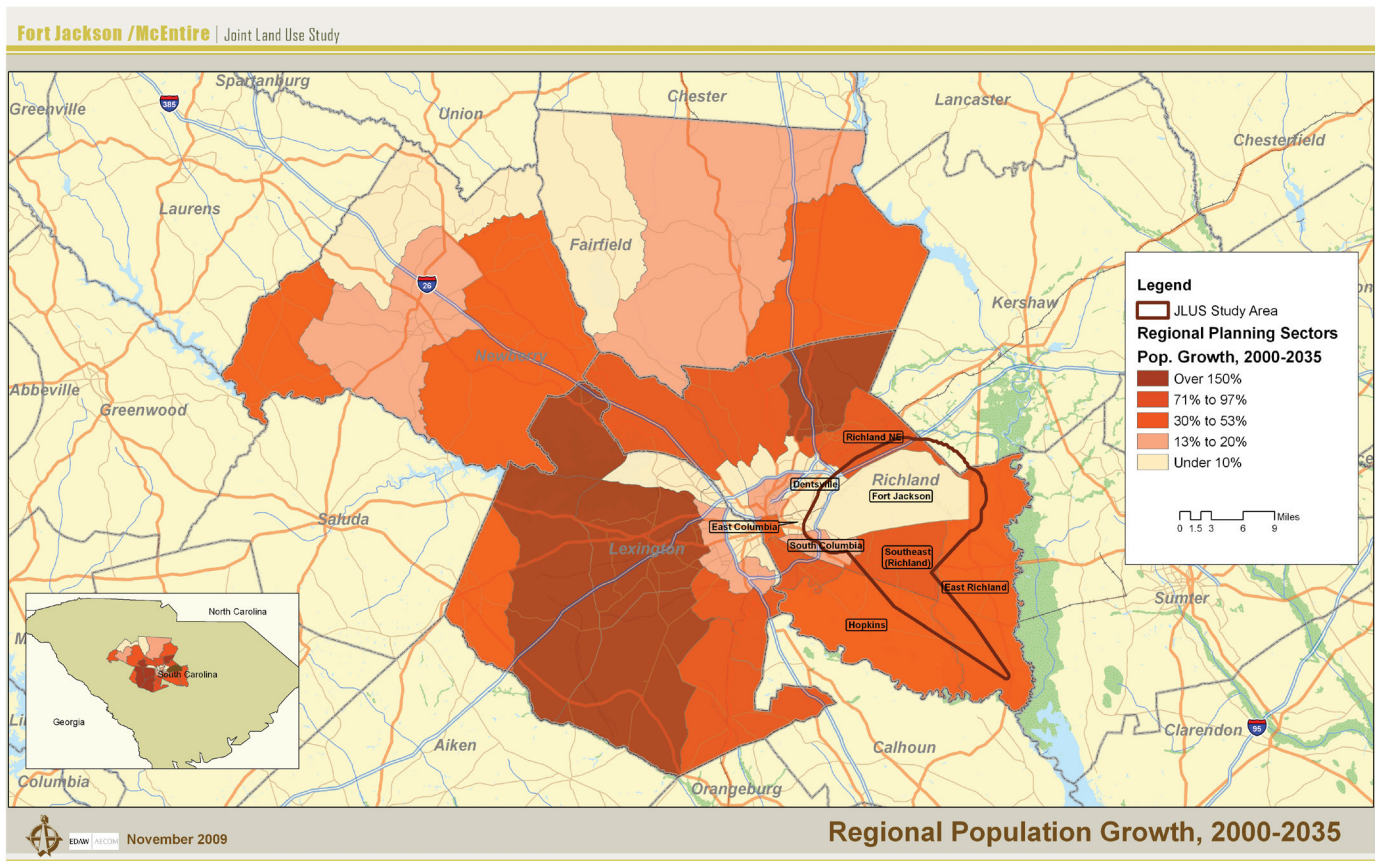


Figure 2.2: Projected Population Change by Planning Sector in the central Midlands Region

Fort Jackson / McEntire | Joint Land Use Study

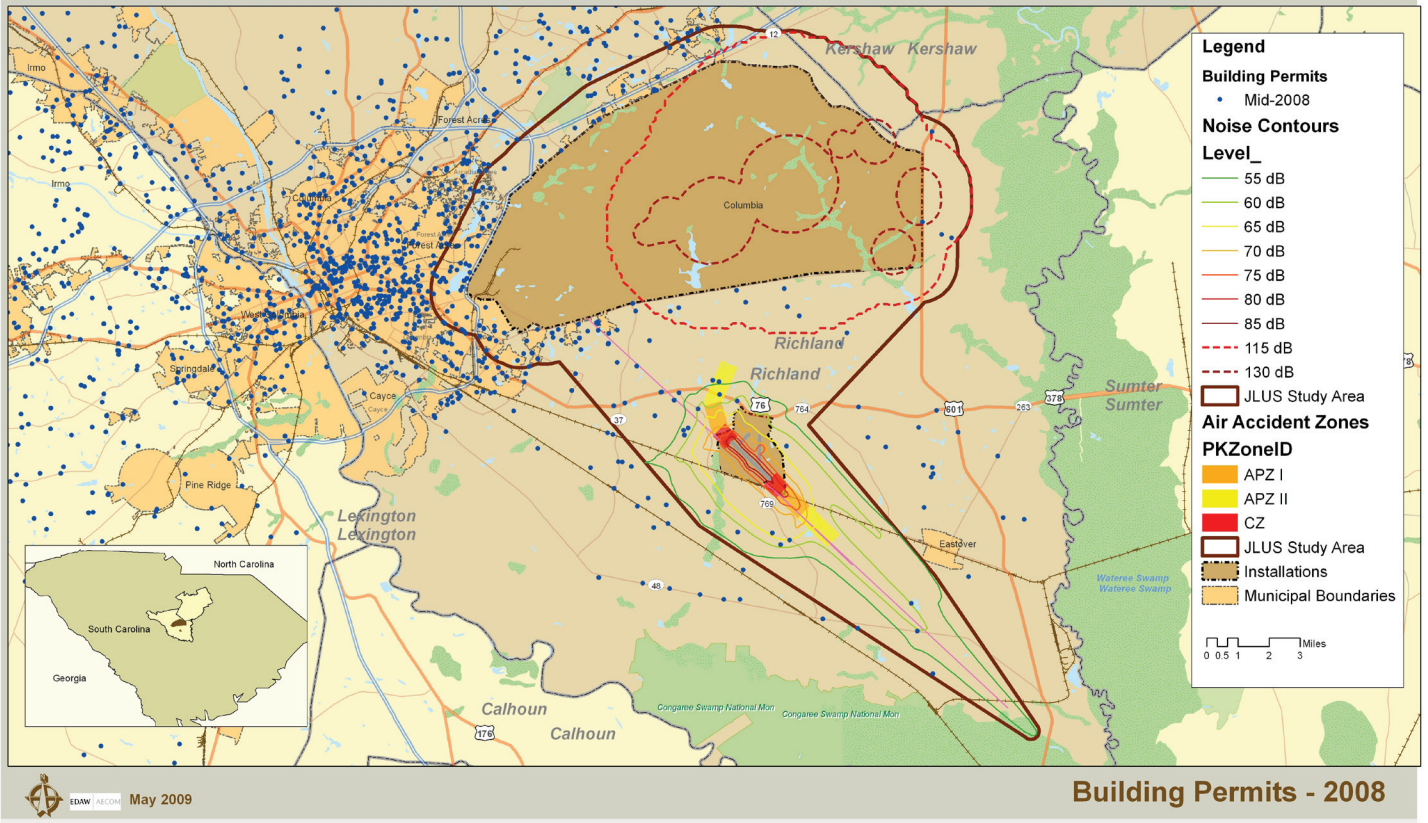


Figure 2.3: Richland County Building Permits 2008

Fort Jackson / McEntire | Joint Land Use Study

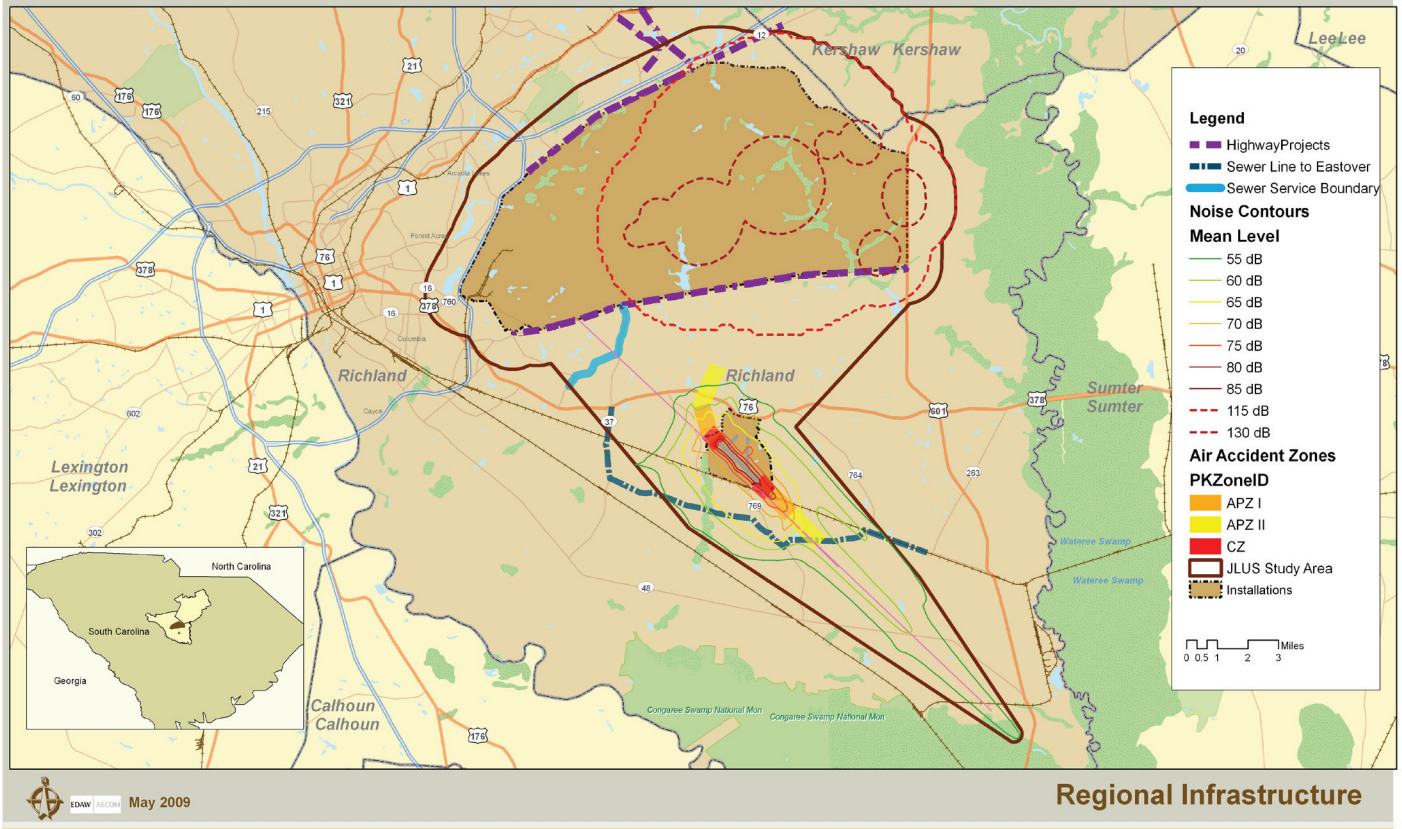


Figure 2.4: Regional Infrastructure Projects

2.7 Environmental Resources

The Fort Jackson/MTC and McEntire installations fall within the Sandhills of South Carolina, an inland habitat type characterized by rolling hills and deep, coarse sands. Only hearty, well-adapted plants, such as turkey oak and longleaf pine trees thrive in the dry, nutrient-poor soil seen in the region. The Sandhills also support many animal species, including reptiles and amphibians like broad-headed skinks, oak toads, six-lined racerunner lizards, glass lizards and hog-nosed snakes, whitetailed deer, opossum, gray foxes, bobcats, fox squirrels, rabbits and birds, such as mourning doves, sparrow hawks, red-tailed hawks and wild turkeys. A federally endangered bird, the Red-Cockaded Woodpecker is found on Fort Jackson/MTC lands.

As is required of all federal entities, the US military must act as strong steward of natural resources, preserving the habitat of endangered or threatened species and minimizing any adverse actions on vulnerable plants and animals. Fort Jackson has received national recognition for its restoration efforts. As was noted earlier, these mandatory conservation efforts can limit training space and reduce the flexibility of the Army and National Guard to perform training and readiness activities. Currently, Fort Jackson/MTC restricts military activities due to required efforts to protect the Red-cockaded Woodpecker, the Rough leaved Loosestrife, and the Smooth Coneflower. Activities that cause habitat and soil disturbance must be minimized, including military maneuver and field training. The Red-cockaded Woodpecker has established habitats on the post, causing the Army to explore mitigation strategies that expand nesting areas on off-post lands. McEntire JNGB has no current restrictions on training activities related to natural resource sensitivities.

Much of Kershaw County and south-central Richland County within the Joint Land Use Study planning area consists of forested lands and wetlands associated with the Wateree and Congaree Rivers and their tributaries (See Figure 2.5). Richland County has nearly 85,000 acres of public and protected lands as part of five federal and state facilities, including Congaree National Park, which preserves the largest tract of old growth bottomland hardwood forest left in the United States. Kershaw County also features an array of natural assets related to its rivers, lakes, prime soils, forested and agricultural areas, and wild game.

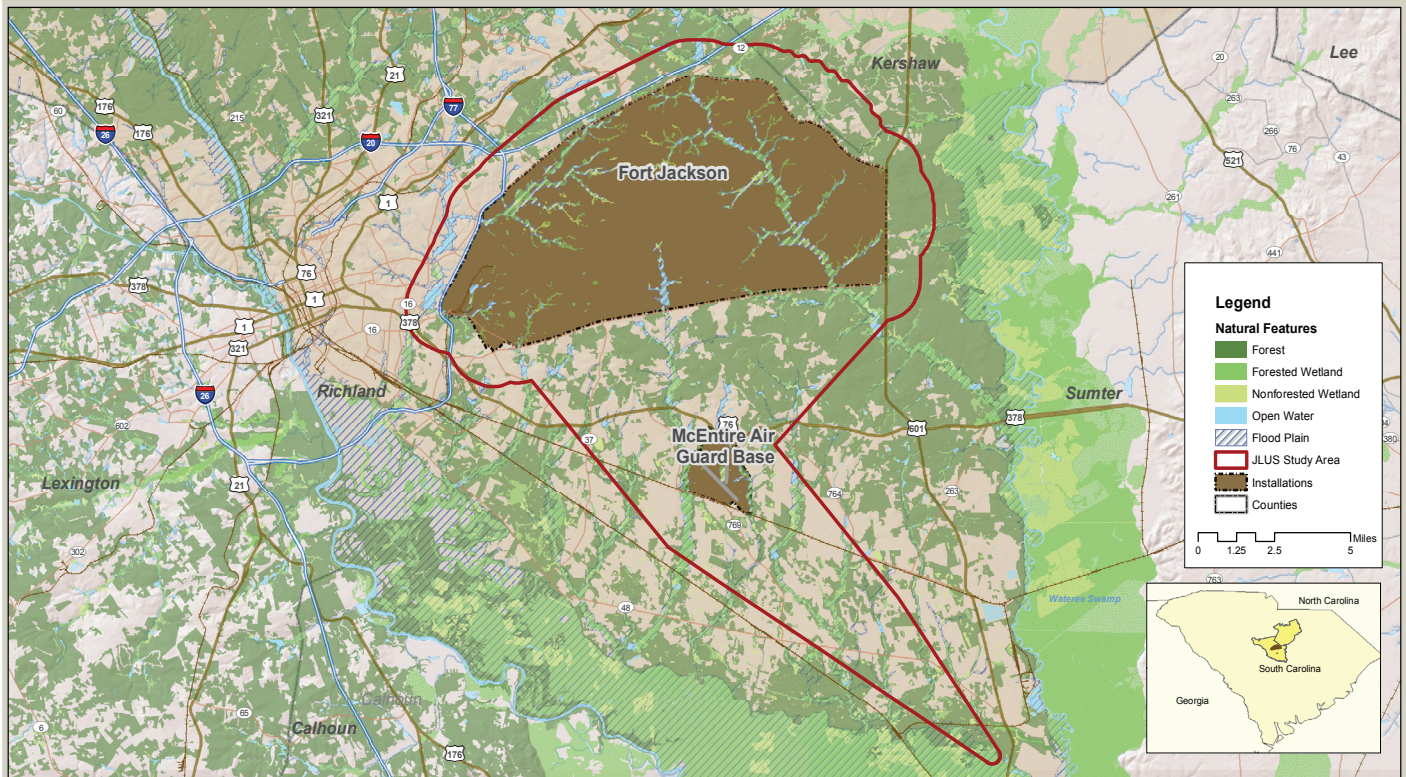
The presence of valuable water and forested resources, particularly to the northeast, east and south of Fort Jackson/MTC has acted as a driving factor in the Midlands Area Joint Installation Consortium initiative and highlights the significant potential to address potential encroachment issues through conservation-related strategies.

The preliminary green infrastructure concept for the Central Midlands region, for example, identifies the area between Fort Jackson and the Wateree River as a Department of Natural Resource focus area and a potential component in the regional open space network. Planning efforts have also recognized opportunities to protect critical lands in Lower Richland County near McEntire, including creating a scenic corridor along U.S. 76/378 running to Sumter County.



In South Carolina, the Rough-leaved Loosestrife is only found on Fort Jackson. Prescribed burns are necessary to reduce competing vegetation. Picture courtesy of Fort Jackson Public Works

Fort Jackson / McEntire | Joint Land Use Study

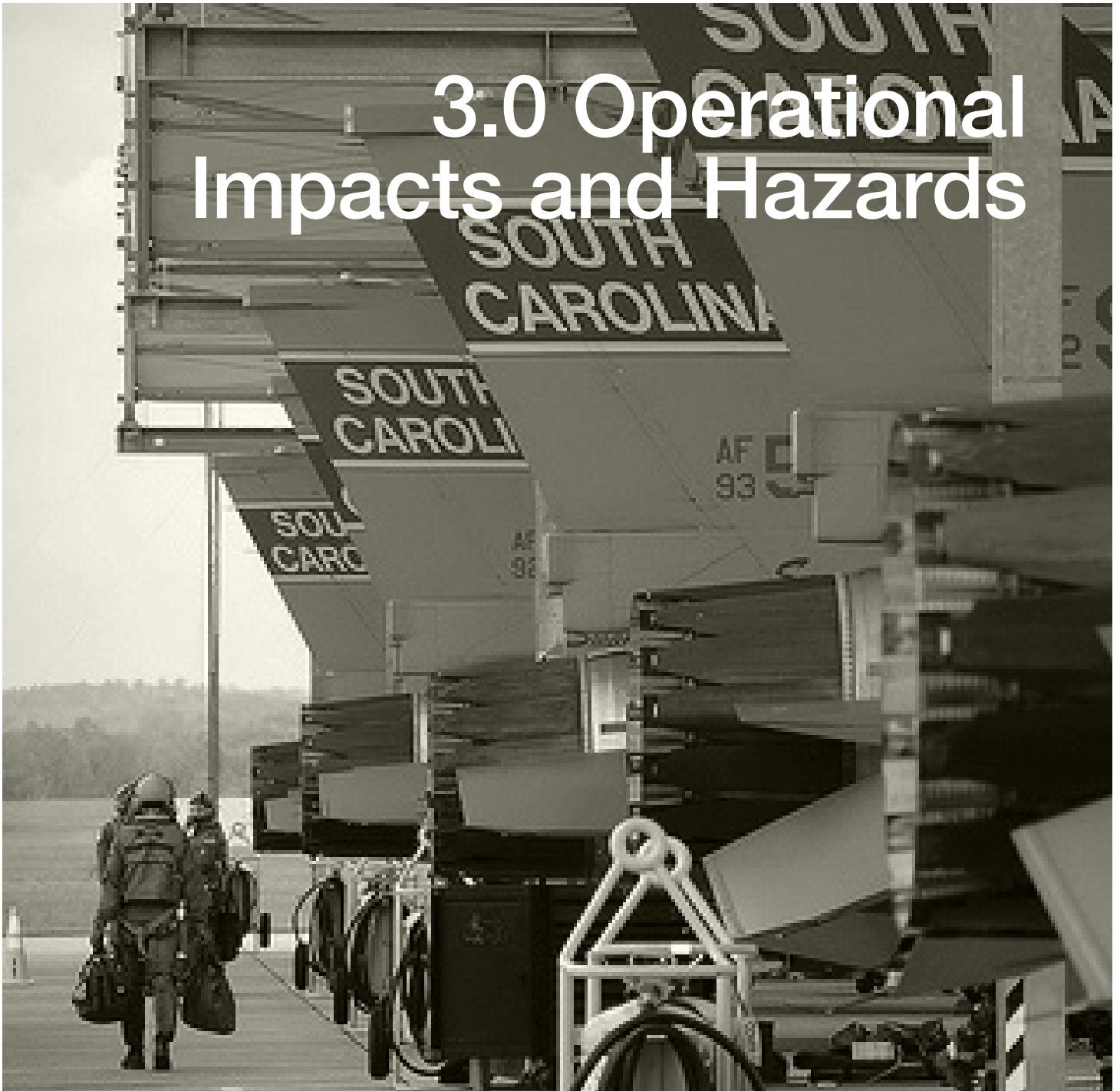


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Figure 2.5: Regional Natural Features

Figure 2.5: Regional Natural Features

3.0 Operational Impacts and Hazards



3.0 Operational Impacts and Hazards

As with all active military installations, routine training and readiness activities at Fort Jackson/MTC and McEntire JNGB produce various impacts that can affect surrounding communities. Conversely, military operations are susceptible to certain proximate civilian activities or to complaints from nearby users.

The planning team consulted with regional stakeholders to identify key operational impacts from a broader list of potential compatibility issues, including:

- Exposure of residents to aviation noise
- Exposure of residents to noise associated with large caliber weapons training and small arms training
- Exposure of residents to noise associated with the movement of tactical vehicles
- Vibration and dust from training activities
- Smoke from prescribed burns on the post or base
- Control of the deer population
- Exposure to the risk of an aircraft accident
- Vertical structures that protrude into the controlled airspace around the base
- Outdoor lighting systems, especially streetlights or exterior security lighting associated with large buildings
- Activities that tend to attract large bird populations, such as landfills or open water
- Activities that release substances into the air, such as steam, dust, or smoke that can impair aviator vision;
- The loss of threatened and endangered species, agricultural lands, and environmentally sensitive resources
- Civilian radio frequency devices, such as those used by industry or public safety agencies
- Transportation impacts on area roadways

Based upon feedback from the Technical Committee and a review of existing conditions and key documents, the

planning team identified the following issues as the primary threats to mission viability and regional quality of life:

- Exposure of residents to noise associated with aviation operations and large caliber weapons firing
- Exposure of residents to the risk of an aircraft accident
- Vertical structures protruding into controlled airspace
- The loss of threatened and endangered species' habitat, agricultural lands, and environmentally sensitive resources
- Transportation impacts on area roadways

3.1 Noise

Fort Jackson/McCrary MTC

Since MTC training activities are the primary source of noise at Fort Jackson, the following noise analysis combines Fort Jackson and McCrary operations. Noise-generating training at Fort Jackson/MTC includes small arms firing, large caliber weapons firing attributable to SCARNG operations, tracked vehicle maneuvers, and some transient aircraft activity. As indicated earlier, small arms firing, maneuver training, and low-level helicopter flights between MTC and McEntire JNGB (shown as the hatched area in Figures 3.1 and 3.2) generate some noise off-post, but levels do not usually exceed a threshold that warrants noise mitigation and planning. The major source of noise on lands adjacent to the post is the firing of large caliber weapons, explosions, and other impulsive sounds.

The military measures noise in decibels (dB) and assigns a weighting based on the noise frequency and source. A-weighting, expressed as dBA, depicts higher frequency noise caused by small arms firing, aircraft use, and vehicle operations. C-weighting shows the low frequency noise and vibration associated with the firing of larger weapons systems (dBC), the major noise generator at Fort Jackson/MTC. Though the impulsive noise produced by large arms weaponry can cause vibration and the shaking of nearby buildings, the noise is air-borne.

The DNL is the standard, accepted methodology for modeling the noise impacts of military activity on surrounding lands. The modeling takes into account variables such as maximum loudness, how long the sound lasts; and the number of annoying sounds. The measure further "penalizes" or places a higher decibel value on noise that occurs at night because it is more disruptive to the surrounding population.

SOUND	dBA	EFFECT
Jet engines (near)	140	Threshold of pain (125 dBA)
Shotgun firing	130	
Jet takeoff (100-200 feet)	130	
Thunderclap (near)	120	Threshold of sensation
Power saw (chain saw)	110	Regular exposure for 1 minute or more risks permanent hearing loss
Jet fly-over (1,000 feet)	103	
Garbage truck/Cement mixer	100	Level at which hearing loss begins (8-hour exposure)
Farm tractor	98	
Lawnmower, Food blender	85-90	
Recreational vehicles, TV	70-90	Annoyance; constant exposure may cause hearing loss
Diesel truck (40 mph, 50 feet)	84	
Garbage disposal	80	
Washing machine	78	Intrusive, interference with conversation
Dishwasher	75	
Vacuum cleaner	70	
Hair dryer	70	Comfortable (under 60 dBA)
Normal conversation	60-65	
Refrigerator humming	40	
Whisper	30	Just audible
Rustling leaves	20	
Normal breathing	10	
None	0	Normal hearing threshold (1000-4000 Hz)

Source: National Association of the Deaf and Hard of Hearing

Table 3.1: Comparable Noise Levels

In addition to operational characteristics, such as the type of weaponry used, meteorological factors, including wind, air temperature, humidity and cloud cover, can affect the path and the intensity of noise as it travels from its source.

Typically, the Army measures impulsive noise using C-Weighted Day Night Sound Levels (CDNL). The CDNL is an annual average of noise that converts sound varying from peak bursts to relative quiet into a steady measure of acoustic energy over a 24 hour period. The number of large caliber weapons fired in the past few years at the post, however, has not been sufficient to generate CDNL noise contours. The Fort Jackson and McCrady Installation Environmental Noise Management Plans, therefore, use predicted peak noise levels (PK15) for typical large caliber activity to identify areas where noise levels can be high enough to generate a moderate or high risk of complaints (See Table 3.2).

The unweighted peak threshold of physiological hearing damage to the human ear is approximately 140 dBP, but the threshold for annoyance in the general public is much

lower. While it varies greatly among individuals noise in excess of 115 dBP can be loud enough to interfere with daily activities and adversely affect quality of life.

The PK15 (met) contours shown in Figure 3.1 give an idea with 85 percent certainty of the loudest noise experienced as a result of any single event at a particular location. Peak noise mapping models the noise effects for the single burst of sound associated with a training event and reflects what people exposed to the noise actually hear, rather than a weighted average. It should be emphasized, however, that these are not discrete lines that sharply divide loud areas from land largely unaffected by noise. Instead, these contours are planning tools that depict the general noise environment around the post based on typical activities. Areas beyond the mapped contours can also experience noise depending upon such variables as training intensity or weather conditions.

McEntire JNGB

The primary source of noise exposure on off-base lands around McEntire JNGB is aircraft operations. As described earlier, the military measures higher frequency noise caused by aircraft using A-weighted decibels. Normal speech has a noise level of approximately 60 dBA and a busy street corner has a noise level of approximately 80 dBA. Table 3.1 expresses common sound levels in dBA for comparison.

Figure 3.2 depicts the noise contours around McEntire JNGB. The Air Force NOISEMAP 7.3 computer program

PREDICTED SOUND LEVEL (PK15(MET))	RISK OF COMPLAINTS
<115	Low risk
115-130	Moderate risk
>130	High risk

Table 3.2: Complaint Risk Guidelines, Peak Noise Levels

that produces the contours reflects average busy-day aircraft operations data collected in 2007. According to the 2008 Air Installation Compatible Use Zone document, a total of 3,927 acres and 375 people off-base are exposed to noise levels of DNL 65 and higher. Since the noise contours for the louder F-35 JSF operations are not yet available, the map also shows the 55 dBA contours. This larger footprint more accurately captures likely noise affected areas based on foreseeable aircraft operations at the base.

3.2 Air Safety

McEntire JNGB

In addition to noise, the Air Force assesses the potential hazards associated with aviation activity. Military airfield planning analyzes historical data on military aircraft accidents to determine where a mishap is most likely to take place and the size of the area likely to be affected. The analysis does not assess the statistical probability of an accident, which is a very low risk, but high consequence occurrence for both pilot and nearby civilians. The findings of the analysis result in three air safety zones around McEntire JNGB (Figure 3.2).

CLEAR ZONE (CZ)

The CZ is an area 3,000 feet wide by 3,000 feet long at the immediate end of a runway. The accident potential in these areas is sufficient to warrant the prohibition of any structures in the CZs.

ACCIDENT POTENTIAL ZONE I (APZ I)

APZ I is less critical than the Clear Zone but still possesses significant potential for accidents. The APZ I is just beyond the CZ, forming an area that is 1,000 feet wide by 5,000 feet long. A variety of industrial, manufacturing, transportation, open space and agricultural uses can exist safely in this zone, though activities that concentrate people are not compatible.

ACCIDENT POTENTIAL ZONE II (APZ II)

APZ II is the least critical of the three air safety zones, but still carries some risk of an accident. APZ II is 1,000 feet wide and 7,000 feet long, extending 15,000 feet from the runway threshold. Compatible land uses include those of APZ I, as well as low density single family residential, and lower intensity commercial

activities. High density functions such as multi-story buildings and places of assembly (e.g., theaters, schools, churches and restaurants), however, raise compatibility issues.

3.3 Height Restrictions and Runway Airspace Imaginary Surfaces

Imaginary surfaces are three-dimensional areas around airfields defining the spaces that must be kept clear of obstacles or land use impacts that interfere with pilot vision to ensure safe aviation. Obstructions to air navigation typically include:

- Natural objects or man-made structures that protrude above the planes or imaginary surfaces, and/or;
- Man-made objects that extend more than 200 feet AGL at the site of the structure.

McEntire JNGB has a series of protected surfaces surrounding the airfield that reflect the approach and departure patterns of operating aircraft. The surfaces are generally sloped, such that the objects closest to the base pose the highest risk of penetrating the airspace and height restrictions ease in the outer areas due to higher aircraft clearance.

According to military guidance, the following uses can pose a hazard in protected air surfaces:

- Releases into the air of any substance that would impair visibility or otherwise interfere with the operation of aircraft (e.g., steam, dust, or smoke);
- Light emissions, either direct or indirect (reflective), that would interfere with pilot vision;
- Electrical emissions that would interfere with aircraft communications systems or navigational equipment;
- Uses that would attract birds or waterfowl, including sanitary landfills, waste transfer facilities, feeding stations, sand and gravel dredging operations, storm water retention ponds, created wetland areas, or the growing of certain vegetation
- Structures within 10 feet of aircraft approach-departure and/or transitional surfaces.

3.4 Other Impacts

While noise and air safety issues are the primary operational issues that will drive the development of encroachment reduction strategies around Fort Jason/ MTC and McEntire JNGB, stakeholders indicated that other impacts could pose a threat to the military mission or quality of life in the region, including:

- The loss of threatened and endangered species, agricultural lands, and environmentally sensitive resources
- Smoke from prescribed burns on the post or base
- Transportation impacts on area roadways

The continued loss and fragmentation of natural habitat surrounding the post or base due to unmanaged development can cause species to seek out the remaining intact open lands on Fort Jackson or McEntire JNGB. The presence of more animals on the installations, particularly if those species are threatened or endangered, can in turn lead to training restrictions. The loss of nearby habitat can thus place additional burdens on the Army and National Guard to maintain habitats, further limiting training flexibility.

The military commonly employs prescribed burns to preserve wildlife habitat and to maintain training maneuver areas. Controlled burns conducted on post and base land can of course generate smoke that affects surrounding communities.

Lastly, Fort Jackson generates unusual transportation-related impacts due to its Initial Entry Training mission. Visitors participating in weekly Graduation and Family Days, combined with the regular flow of military personnel and contractors to and from the post, contribute to vehicular congestion on the surrounding road network, especially at post gates and at Exit 10 and Exit 12 on I-77. Localized traffic congestion affects both quality of life and mobility for area residents, as well as the military's ability to deploy vehicle convoys or quickly access the post.

All of the impacts identified in this section assist in identifying Areas of Concern around Fort Jackson/MTC and McEntire JNGB and in guiding the development of appropriate land use compatibility tools and strategies.



Forest Drive near Fort Jackson

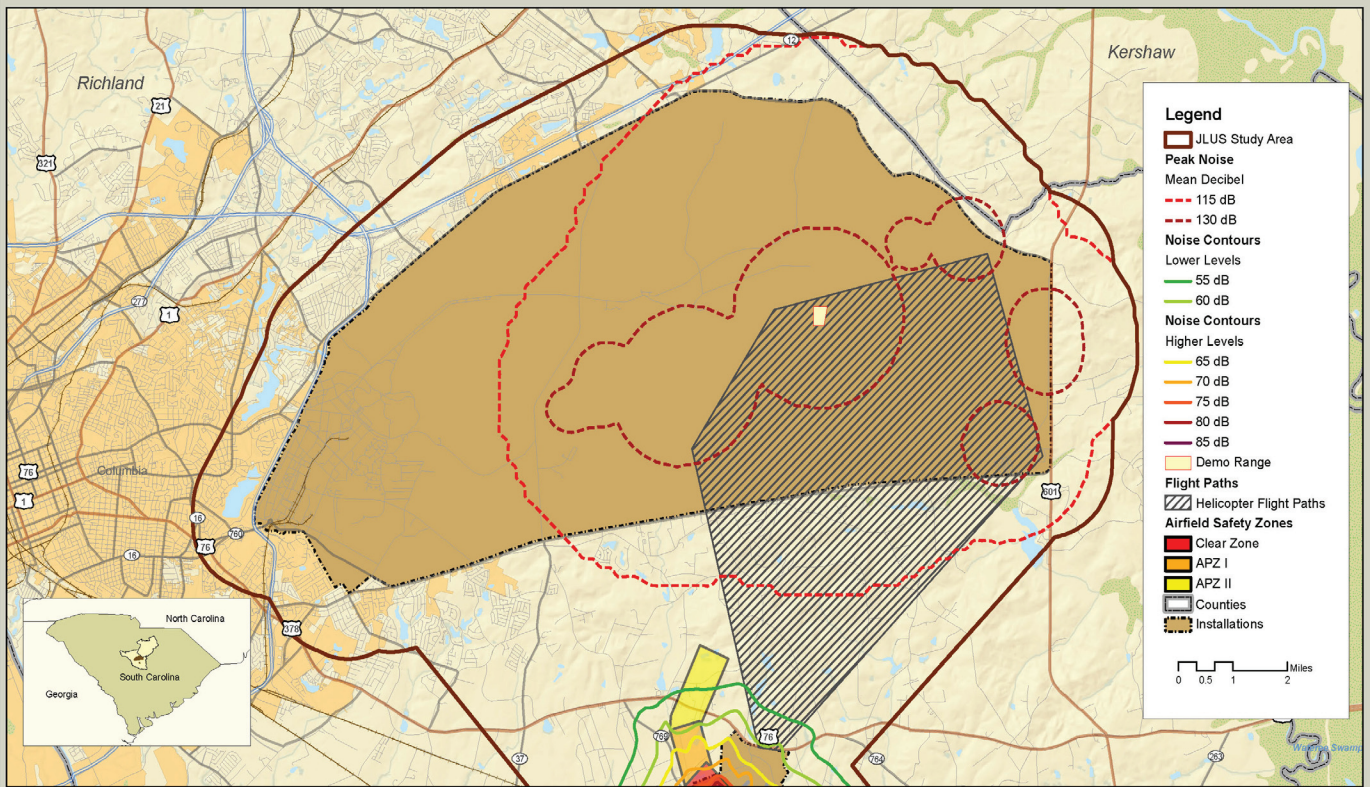


Kershaw County Court House



Richland County Administrative Building

Fort Jackson /McEntire | Joint Land Use Study

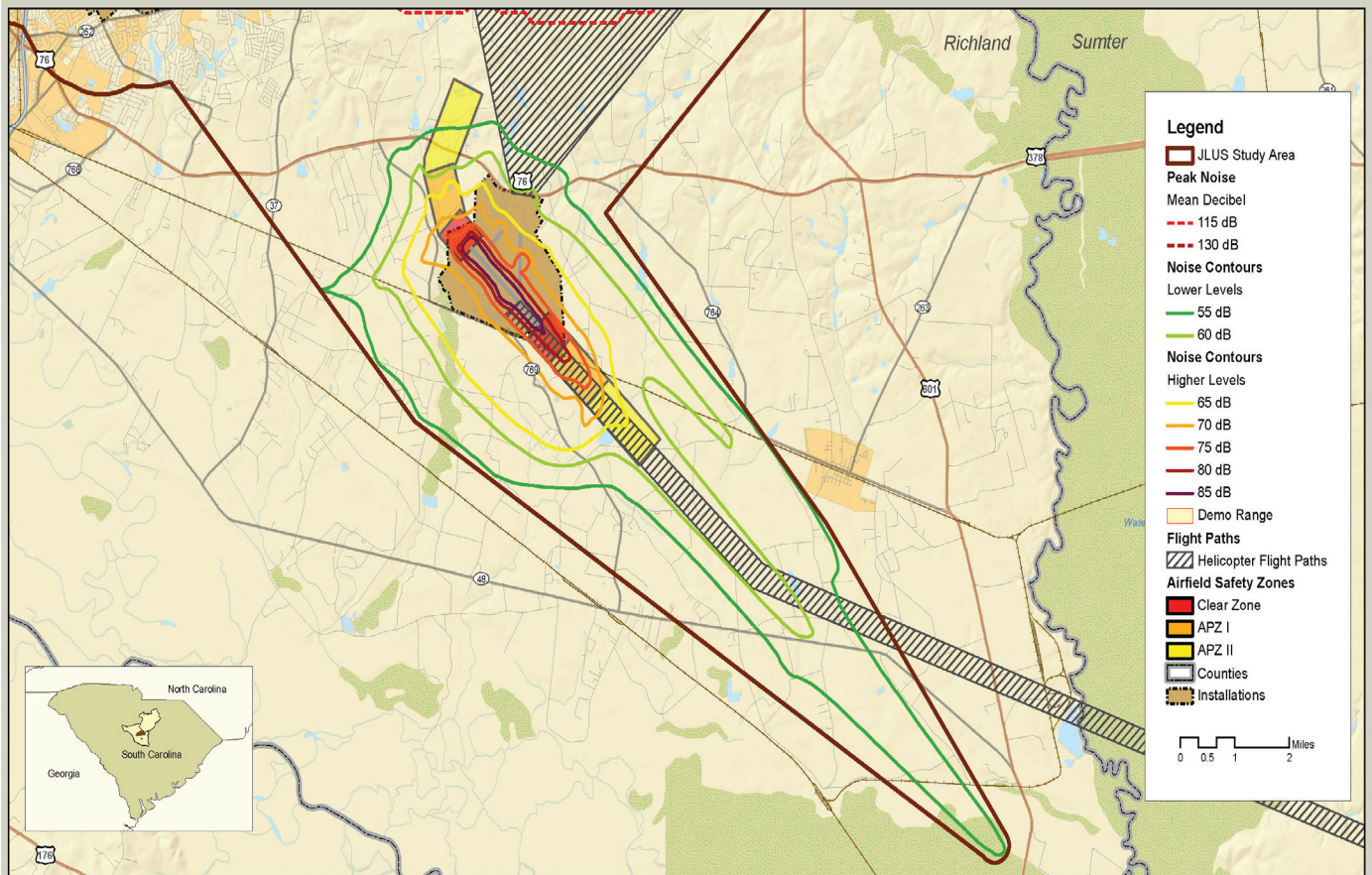


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Noise and Flight Impacts - Fort Jackson

Figure 3.1: Noise and Flight Impacts Around Fort Jackson

Fort Jackson /McEntire | Joint Land Use Study



Noise and Flight Impacts - McEntire Air Guard Base

Figure 3.2: Noise and Flight Impacts Around McEntire JNGB

4.0 Overview of Compatibility Efforts



4.0 Overview of Compatibility Efforts

The complexity of coordinating land use issues across jurisdictional boundaries and the limited authority and resources of any individual entity requires concerted action among multiple stakeholders, including federal, state, regional and local governments; the military and civilian sectors; non-profit organizations; and private landowners. This section gives an overview of compatibility efforts undertaken to date by federal, state, regional and local partners.

4.1 Federal Initiatives

Sustainable Range Program

The Department of Defense (DoD) developed the Sustainable Range Program (SRP) to give Army installations access to an array of planning, facilities management, environmental management, munitions management, and safety program tools. The SRP is a comprehensive approach to improve the way the Army plans, manages, and uses its ranges in support of long-term viability, more efficient and effective training, and reduced demands on scarce resources, such as land, air, water, and energy. The SRP includes several major efforts:

- The Range and Training Land Program (RTLTP) plans for the safe day-to-day management of range lands and enhanced training performance;
- The Integrated Training Area Management (ITAM) Program seeks to achieve the optimum use of lands for combat realistic training through planning, rehabilitation, maintenance, mapping, assessment, and monitoring; and
- The Readiness and Environmental Protection Initiative

(REPI) is a collaborative effort to reduce the risk of encroachment from off-post activity.

4.2 Readiness and Environmental Protection Initiative

Once specifically sited in remote areas, military installations are now often in the path of advancing ex-urban development or have generated external growth through spin-off economic activities. Over the past decade, the DoD has increasingly recognized encroachment as a major constraint in safely and effectively carrying out the training and readiness activities of the military.

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 installations.

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 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 operations of the nearby installation. REPI is the fastest growing conservation-based program in the federal government.

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, installation 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.

4.3 Military Initiatives

The Army and Air Force use several key tools to promote land use compatibility and minimize operational impacts on surrounding lands, including ongoing outreach strategies and mitigation procedures laid out in planning documents, such as the Installation Environmental Noise Management Plan (IENMP), the Air Installation Compatibility Use Zone (AICUZ) Plan, sustainability initiatives, including the REPI program, and regional land use planning efforts such as this Joint Land Use Study.

Operational Noise Management Plan (ONMP)

The DoD requires each installation to create an Operational Noise Management Plan (ONMP), which addresses noise from all military activities, not just airfields. The ONMP is designed to:

- Control operational noise to protect the health and welfare of military personnel and their dependents, Army civilian employees, and members of the public on lands adjacent to Army installations; and
- Reduce community annoyance from operational noise, to the extent feasible, consistent with Army training and materiel testing activities.

Fort Jackson recently updated its ONMP in mid-2008. The South Carolina Army National Guard Statewide ONMP, published in 2007, includes McCrady Training Center (MTC) and McEntire Joint National Guard Base. While the SCARNG operations are a major noise generator, Fort Jackson typically implements noise abatement procedures and addresses community complaints.

Fort Jackson has adopted Standard Operating Procedures to mitigate noise impacts on the surrounding community and still perform mission-critical training exercises. Because the public distinction between Fort Jackson and McCrady Training Center is often overlooked, McCrady schedules all range activity through Fort Jackson's Range Control. Mitigation measures, contained within FJ Regulations 350-14, include:

- Limit mass fires to those deemed absolutely essential for successful field training objectives.
- No mass fires are permitted by units larger than a single battery between 10 PM and 12 AM.
- Artillery, tank and mortar firing are not permitted between midnight and 6:30 AM daily and from 10 AM to 1 PM on Sundays. Some exceptions are made for mission essential exercises.
- Mass training of more than one battalion of artillery

must coordinate with the Installation Range Officer and Public Affairs Office at least 90 days in advance so that appropriate advance publicity of the firing can be made.

- Range Control may impose additional restrictions to reduce noise levels if weather conditions will enhance sound travel, such as overcast skies.
- The South Carolina Army National Guard (McCrady) may not fire Multiple Launch Rocket Systems (MLRS) within 1,000 meters of the installation boundary. (This regulation may be out of date as the MLRS is not scheduled for use at McCrady in the future.)

The close coordination between McCrady and Fort Jackson helps ensure that consistent communication with the public is funneled through the Fort Jackson Public Affairs Office (PAO). Specific training exercises must be coordinated with the PAO office to ensure advance media releases to the surrounding communities. These include:

- Battery or larger planned artillery (MLRS) firing
- Three or more helicopters plan to conduct map of the earth (200 foot above the ground) flight training
- Three or more formations of aviation night flights
- Any training out of the ordinary that might induce the surrounding community to complain about the noise

Joint Land Use Study (JLUS)

In 1985, the 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 communities initiated this JLUS effort for the Central Midlands region around Fort Jackson and McEntire JNGB. The Office of Economic Adjustment (OEA) within the DoD funded the majority of the study, while the communities supplemented the initiative with their resources.

Army Compatible Use Buffer (ACUB)

In 2003, the Army established the Army Compatible Use Buffer (ACUB) Program to meet the complementary goals of protecting military installations from encroachment, while preserving the valuable habitat surrounding these installations. Locally referred to as the JCUB (Joint Compatible Use Buffer) due to participation by both the Army and Air Force, the program allows installations to

protect adjacent non-military land through partnerships with state and local governments or non-governmental organizations. The partners share the cost of purchasing conservation easements from willing sellers, thus preserving high-value wildlife habitat and limiting incompatible development around installations. The local effort to implement the JCUB program is described below in the Regional Compatibility Initiatives section.

Air Installation Compatibility Zone (AICUZ)

In 1972, the Department of Defense established the Air Installation Compatibility Use Zone (AICUZ) program, to identify noise affected areas around airfield installations and to develop cooperative approaches for reducing adverse impacts. McEntire Joint National Guard Base recently updated their previous 2001 AICUZ in 2008. The AICUZ document describes three major types of constraints that affect or result from aircraft operations: accident potential, noise exposure, and structure height restrictions (including runway airspace imaginary surfaces).

In an effort to reduce the noise effects of McEntire JNGB operations on surrounding communities, the base restricts nighttime flying activities and routes flight tracks to avoid populated areas. Practice takeoffs/landings and instrument approaches are not scheduled between 10:00 PM and 7:00 AM. Only mission essential aircraft arrivals and departures are conducted during nighttime hours. McEntire JNGB representatives also conduct active outreach to the community to address noise related issues.

4.4 State Initiatives

The State of South Carolina's Code (6-29-1530) requires planning entities to provide information to the military installation commander 30 days prior to the public hearing on a land use plan or zoning proposal for property that is within 3,000 feet of a military installation, Clear Zone, or Accident Potential Zones I and II. The commanders' comments are intended to assist the planning entity in assessing:

- If the proposed use is suitable given the proximity of the military installation.
- If the proposal will adversely affect the existing use or usability of nearby property;
- If the affected property has a reasonable economic use as currently zoned;
- If the proposed use could cause safety issues to such

items as streets, transportation facilities, utilities or schools;

- If a land use plan has been adopted and if so, if the proposed change conforms with the policy and intent of the land use plan; and
- If there are existing or changing conditions that would affect the use of nearby property.

If the military commander does not submit a response by the date of the public hearing then the proposed zoning change is presumed to not have an adverse effect. Any information received becomes part of the public record. Local governments must also incorporate identified boundaries, easements, and restrictions for federal military installations into official maps.

4.5 Regional Initiatives

Midlands Area Joint Installation Consortium (MAJIC)

MAJIC is an organization that consists of the five military installations in the Central Midlands region (Fort Jackson, McCrady Training Center, McEntire Joint National Guard Base, Shaw Air Force Base and Poinsett Range), local governments, the Central Midlands Council of Governments and non-profit partners such as the Congaree Land Trust and The Conservation Fund. Members are working together to promote the sustainability of the region's military installations and environment.

MAJIC successfully submitted a proposal to the Army Compatible Use Buffer Program for funding to purchase conservation easements from willing sellers. These easements allow the property owner to retain their land as it is currently used and permanently protects the property from future development that could be considered incompatible with military activities. The easement stays with the property into perpetuity, even with the sale or transfer of the land.

MAJIC identified the land targeted for conservation easements in the ACUB proposal (locally referred to as the Joint Compatible Use Buffer, or JCUB) through the use of a prioritization formula. The members thoroughly explored all desired criteria for land preservation from each stakeholder, including the land's military value, conservation value, parcel size and risk of future development. Each parcel was then graded on these criteria and ranked as compared to other parcels in the region. When mapped, priority areas are identifiable.

Focus areas include properties between Fort Jackson and McEntire JNGB, areas south and southeast of McEntire JNGB, properties south and southwest of Poinsett, and areas south of Shaw AFB.

The goal for MAJIC is to encumber 16,000 acres in the first six years at an estimated cost of \$24 Million. MAJIC strives to keep the DoD cost share at 25 percent or lower by leveraging other funding sources, such as South Carolina state conservation money, non-profit funding, or private donations. For properties that have a higher military mission value, a greater DoD cost share is appropriate; for those properties with lower military mission value but higher conservation value, a lesser DoD cost share is appropriate. However, MAJIC is looking for other funding options. Where once the South Carolina Conservation Bank funds were the primary funding source for leveraging JCUB monies, MAJIC is now seeking other options due to cuts made to the Conservation Bank.

The Congaree Land Trust and The Conservation Fund are the partnering entities actively seeking to secure easements. Several properties are anticipated to be closed in 2009. MAJIC members expect that the successful closure of these initial deals will facilitate future easement purchases. Discussions are currently under way for two pieces of property to the east of Fort Jackson near the McCrady Training Center. For Fiscal Year 2009, MAJIC received one million dollars. To date the total DoD contribution has been 2.4 million dollars.

4.6 Local Initiatives

Comprehensive Plan policies and zoning regulations are among the most basic tools that local governments use to minimize the risk of land use conflicts around military installations.

Richland County

Richland County has instituted an Airport Overlay District for areas surrounding McEntire JNGB. The intent of this overlay district to prevent conditions that are hazardous to aircraft operation, to prevent land use conflict that may result in loss of life and property in the event of an aircraft accident, and to encourage compatible development in the vicinity of the base. The overlay district consists of various zones (e.g., horizontal zones, approach zones, etc.) that restrict development in accordance with FAA and Air Force airfield development policies.

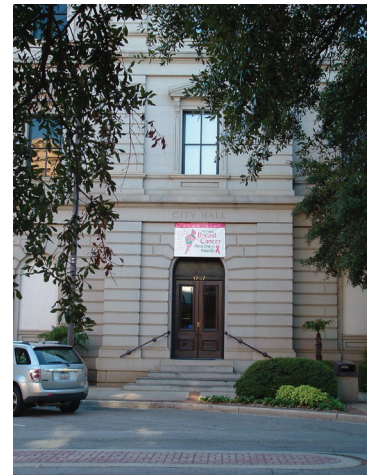
Kershaw County

The Kershaw County Zoning Code includes a Rural Resource District to the northeast of Fort Jackson. The intent of this district is to protect agricultural lands, woodlands, wetlands and other resources from development, thus preserving the predominant rural character of the area. Conservation of the rural landscape is highly consistent with land use guidance that seeks to minimize conflicts between military operational impacts and incompatible development, such as higher density housing.

The Kershaw County Comprehensive Plan does not currently contain language on the value of collaborative planning with Fort Jackson or reference land use policies designed to guide growth away from areas near the post.

City of Columbia

Zoning is a somewhat less effective tool for the City of Columbia in managing the potential land use conflicts with Fort Jackson. Most of the city lies to the west of post near the cantonment area and away from noise exposed areas, which are east of the installation.



Columbia City Hall

The Comprehensive Plan for the City of Columbia, however, specifically references the Joint Land Use Study and notes that the recommendations of the report will be instrumental in guaranteeing the longevity of regional military installations and ensuring the protection of neighboring properties.

Other Communities and Stakeholders

Currently, the Town of Eastover and the community of Gadsden do not have general zoning.

The Greater Columbia Chamber of Commerce also oversees the Friends of Our Forces program, a collaborative effort with Fort Jackson that recognizes the importance of the military, their families and retired military personnel to the region.

5.0 Compatibility Analysis



5.0 Compatibility Analysis

Compatibility means that land uses can occur close to one another without causing interference or creating conflicts. This section gives an overview of compatibility in the military context and assesses issues around Fort Jackson and McEntire JNGB.

5.1 Compatibility Guidelines

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 (FICUN 1980), the Land Use Compatibility Guidelines for APZs (DoD 1977) and The Air Force Handbook 32-7084, 1 March 1999, AICUZ Program Manager's Guide. Table 5.1 shows the compatibility of various land uses in noise or risk-exposed areas. Uses depicted in yellow are conditionally compatible and may require further protection measures, such as indoor noise reduction or real estate disclosure. Activities shown in red are unacceptable within the given zones, indicating that a prohibition of the use is the most appropriate regulatory action. Land uses shown in green are deemed to be a safe fit with nearby noise-generating activities and aviation operations. These guidelines are only advisory in nature. Only local governments have the authority to determine permissible land uses on private lands around a military installation.

In general, guidance states that housing is compatible with noise exposure up to DNL 55 dB. Standards indicate that with exposure between DNL 65–75 dB, additional protective measures, such as indoor noise reduction, for residential uses may be warranted. Guidelines deem noise exposure that exceeds DNL 75 dB to be incompatible with all residential uses. Similarly, noise up to 115 db can create conflict with noise sensitive uses. Exposure in excess of 130 dB can trigger nuisance and public safety

issues sufficient to warrant strict land use regulation. Many uses, such as manufacturing, retail, government facilities, and agriculture, however, can be suitable even within a relatively high noise setting.

The risk of interference with aviation operations and exposure to the impact of an aircraft accident is so significant in the Clear Zone that guidance advises the complete prohibition of structures in these areas immediately off of the runway. The risk of encroachment and safety issues remains relatively high in Accident Potential Zone (APZ) I, with suggested restrictions on all housing, some types of manufacturing and many retail and cultural uses. Recommendations for development restrictions relax in Accident Potential Zone (APZ) II with low density single family housing and low intensity retail activities deemed appropriate.



New residential construction in noise zones can pose a risk of land use conflict



Existing Residential along Percival Road

LAND USE		ACCIDENT POTENTIAL ZONES			NOISE ZONES (dB)			
SLUCM NO.	NAME	CLEAR ZONE	APZ 1	APZ 2	65-69	70-74	75-79	80+
10	Residential							
11	Household units							
11.11	Single units; detached	N	N	Y ¹	A ¹¹	B ¹¹	N	N
11.12	Single units; semi detached	N	N	N	A ¹¹	B ¹¹	N	N
11.13	Single units; attached row	N	N	N	A ¹¹	B ¹¹	N	N
11.21	Two units; side-by-side	N	N	N	A ¹¹	B ¹¹	N	N
11.22	Two units; stacked	N	N	N	A ¹¹	B ¹¹	N	N
11.31	Apartments; walk up	N	N	N	A ¹¹	B ¹¹	N	N
11.32	Apartments; elevator	N	N	N	A ¹¹	B ¹¹	N	N
12	Group quarters	N	N	N	A ¹¹	B ¹¹	N	N
13	Residential hotels	N	N	N	A ¹¹	B ¹¹	N	N
14	Mobile home parks or courts	N	N	N	N	N	N	N
15	Transient lodgings	N	N	N	A ¹¹	B ¹¹	C ¹¹	N
16	Other residential	N	N	N ¹	A ¹¹	B ¹¹	N	N
20	Manufacturing							
21	of Food & kindred products	N	N ²	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
22	of Textile mill products	N	N ²	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
23	of Apparel and other finished products made from fabrics, leather, and similar materials	N	N	N ²	Y	Y ¹²	Y ¹³	Y ¹⁴
24	of Lumber and wood products (except furniture)	N	Y ²	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
25	of Furniture and fixtures	N	Y ²	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
26	of Paper & allied products	N	Y ²	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
27	of Printing, publishing, and allied industries	N	Y ²	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
28	of Chemicals and allied products	N	N	N ²	Y	Y ¹²	Y ¹³	Y ¹⁴
29	of Petroleum refining & related industries	N	N	N	Y	Y ¹²	Y ¹³	Y ¹⁴

Table 5.1: Land Use Compatibility Guidance

LAND USE		ACCIDENT POTENTIAL ZONES			NOISE ZONES (dB)			
SLUCM NO.	NAME	CLEAR ZONE	APZ 1	APZ 2	65-69	70-74	75-79	80+
30	Manufacturing							
31	Rubber and miscellaneous plastic products	N	N ²	N ²	Y	Y ¹²	Y ¹³	Y ¹⁴
32	Stone, clay and glass products	N	N ²	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
33	Primary metal industries	N	N ²	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
34	Fabricated metal products	N	N ²	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
35	Professional and scientific instruments	N	N	N ²	Y	A	B	N
39	Miscellaneous manufacturing	N	Y ²	Y ²	Y	Y ¹²	Y ¹³	Y ¹⁴
40	Transportation, communications and utilities							
41	Railroad, rapid rail transit and street railroad transportation	N ³	Y ⁴	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
42	Motor vehicle transportation	N ³	Y	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
43	Aircraft transportation	N ³	Y ⁴	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
44	Marine craft transportation	N ³	Y ⁴	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
45	Highway & street right-way	N ³	Y	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
46	Automobile parking	N ³	Y ⁴	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
47	Communications	N ³	Y ⁴	Y	Y	A ¹⁵	B ¹⁵	N
48	Utilities	N ³	Y ⁴	Y	Y	Y	Y ¹²	Y ¹³
49	Other transportation communications and utilities	N ³	Y ⁴	Y	Y	A ¹⁵	B ¹⁵	N
50	Trade							
51	Wholesale trade	N	Y ²	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
52	Retail trade-building materials, hardware and farm equipment	N	Y ²	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
53	Retail trade- general merchandise	N	N ²	Y ²	Y	A	B	N
54	Retail trade- food	N	N ²	Y ²	Y	A	B	N
55	Retail trade- automotive, marine craft, aircraft and accessories	N	Y ²	Y ²	Y	A	B	N
56	Retail trade- apparel and accessories	N	N ²	Y ²	Y	A	B	N
57	Retail trade- furniture, home furnishings and equipment	N	N ²	Y ²	Y	A	B	N
58	Retail trade- eating and drinking establishments	N	N	N ²	Y	A	B	N
59	Other retail trade	N	N ²	Y ²	Y	A	B	N

Table 5.1 (cont.): Land Use Compatibility Guidance

LAND USE		ACCIDENT POTENTIAL ZONES			NOISE ZONES (dB)			
SLUCM NO.	NAME	CLEAR ZONE	APZ 1	APZ 2	65-69	70-74	75-79	80+
60	Services							
61	Finance, insurance and real estate services	N	N	Y ⁶	Y	A	B	N
62	Personal services	N	N	Y ⁶	Y	A	B	N
62.4	Cemeteries	N	Y ⁷	Y ⁷	Y	Y ¹²	Y ¹³	Y ^{14, 21}
63	Business services	N	Y ⁸	Y ⁸	Y	A	B	N
64	Repair services	N	Y ²	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
65	Professional services	N	N	Y ⁶	Y	A	B	N
65.1	Hospitals, nursing homes	N	N	N	A*	B*	N	N
65.1	Other medical facilities	N	N	N	Y	A	B	N
66	Contract construction services	N	Y ⁶	Y	Y	A	B	N
67	Governmental services	N	N	Y ⁶	Y*	A*	B*	N
68	Educational services	N	N	N	A*	B*	N	N
69	Miscellaneous services	N	N ²	Y ²	Y	A	B	N
70	Cultural, entertainment and recreational							
71	Cultural activities (including churches)	N	N	N ²	A*	B*	N	N
71.2	Nature exhibits	N	Y ²	Y	Y*	N	N	N
72	Public assembly	N	N	N	Y	N	N	N
72.1	Auditoriums, concert halls	N	N	N	A	B	N	N
72.11	Outdoor music shell, amphitheaters	N	N	N	N	N	N	N
72.2	Outdoor sport arenas, spectator sports	N	N	N	Y ¹⁷	Y ¹⁷	N	N
73	Amusements	N	N	Y ⁸	Y	Y	N	N
74	Recreational activities (including golf courses, riding stables, water recreation)	N	Y ^{8, 9, 10}	Y	Y*	A*	B*	N
75	Resorts and group camps	N	N	N	Y*	Y*	N	N
76	Parks	N	Y ⁸	Y ⁸	Y*	Y*	N	N
79	Other cultural, entertainment and recreation	N	Y ⁹	Y ⁹	Y*	Y*	N	N
80	Resources production and extraction							
81	Agriculture (except livestock)	Y ¹⁶	Y	Y	Y ¹⁸	Y ¹⁹	Y ²⁰	Y ^{20, 21}
81.5-- 81.7	Livestock farming and animal breeding	N	Y	Y	Y ¹⁸	Y ¹⁹	Y ²⁰	Y ^{20, 21}
82	Agricultural related activities	N	Y ⁵	Y	Y ¹⁸	Y ¹⁹	Y ²⁰	N
83	Foresry activities and related services	N ⁵	Y	Y	Y ¹⁸	Y ¹⁹	Y ²⁰	Y ^{20, 21}
84	Fishing activities and related services	N ⁵	Y ⁵	Y	Y	Y	Y	Y
85	Minine activities and related services	N	Y ⁵	Y	Y	Y	Y	Y
89	Other resources production and extraction	N	Y ⁵	Y	Y	Y	Y	Y

Table 5.1 (cont.): Land Use Compatibility Guidance

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

Y - (Yes) - Land use and related structures are compatible without restriction.

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

Y^x - (yes with restrictions) - Land use and related structures generally compatible; see notes indicated by the superscript.

N^x - (no with exceptions) - See notes indicated by the superscript.

NLR - (Noise Level Reduction) - NLR (outdoor to indoor) to be achieved through noise attenuation measures

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

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

* - The designation of these uses as “compatible” in this zone reflects federal agencies’ and program considerations of general cost and feasibility, as well as past community experiences. Localities, when evaluating the application of these guidelines to specific situations, may have different concerns or goals to consider.

1. Suggested maximum density of 1-2 dwelling units per acre, possibly increased under a Planned Unit Development (PUD) where maximum lot coverage is less than 20 percent.

2. Within each land use category, further deliberating by local authorities may be needed due to the variation. Shopping malls and shopping centers are considered incompatible use in any accident potential zone (CZ< APZ 1, or APZ 2).

3. The placing of structures above-ground utility lines in the clear zone is subject to sever restrictions

4. No passenger terminals and no major above-ground transmission lines in APZ 1.

5. Factors to be considered: labor intensity, structural coverage, explosive characteristics, and air pollution.

6. Low-intensity office uses only. Meeting places, auditoriums, etc., are not recommended.

7. Excludes chapels.

8. Facilities must be low intensity.

9. Clubhouses not recommended.

10. Areas for gatherings of people are not recommended.

11A. Although local conditions may require residential use, it is discourage in DNL/ CNEL 65-69 dB and strongly discouraged in DNL/CNEL 70-74 dB. The absence of viable alternative development options should be determined and an evaluation indicating a demonstrated community need for residential use would both be met if development were prohibited in these zones should be conducted prior to approvals.

11B. Where the community determines the residential uses must be allowed, measures to achieve outdoor to indoor Noise Level Reduction (NRL) for DNL/CNEL 65-69 dB and DNL/CNEL 70-74 dB should be incorporated.

11C. NRL criteria will not eliminate outdoor noise problems. However, building location and site planning can help mitigate outdoor exposure, particularly from near ground level sources. Measures that reduce outdoor noise should be used whenever practical in preference to measures which only protect interior spaces.

12. Measures to achieve the same NRL as required for facilities in DNL/CNEL 65-69 dB range much be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.

13. Measures to achieve the same NRL as required for facilities in DNL/CNEL 70-74 dB range much be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low

14. Measures to achieve the same NRL as required for facilities in DNL/CNEL 75-79 dB range much be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low

15. If noise sensitive, use indicated NRL; if not, the use is compatible.

16. No buildings.

17. Land use is compatible provided special sound reinforcement systems are installed.

18. Residential buildings require the same NLR as required for facilities in DNL/CNEL 65-69 dB range.

19. Residential buildings require the same NLR as required for facilities in DNL/CNEL 70-74 dB range.

20. Residential buildings are not permitted

21. Land use is not recommended. If the community decides the use is necessary, hearing protection devices should be worn by personnel.

5.2 Compatibility Assessment

Existing Land Use

The area west of Fort Jackson in the City of Columbia and the City of Forest Acres is mostly developed, ranging from urban to suburban densities. To the north and north-west of the post, the predominant existing land use between I-20 and Percival Road (SC 12) is single family detached housing, typically at a density of about eight dwelling units per acre. The area also includes scattered retail and some industrial activity, especially in proximity to I-20.

Existing uses in Kershaw County to the north-east of MTC are mostly rural residential, agriculture and timber with pockets of manufactured housing and industrial uses, such as Capital Concrete Company, near Percival Road. Several major areas with active conservation easements exist to the east of the installation.

Although growth is spreading eastward from Columbia, rural land use remains the major development pattern in Lower Richland County. Approximately 75 percent of the land within this part of the county is classified as rural. In general, the property surrounding McEntire JNGB consists of agricultural and open space uses with limited industrial activity on Congaree Road. Property encumbered by conservation easements lies along Congaree Road and near Old Eastover Road.

Zoning

With the exception of an industrial parcel, all of the land in Kershaw County to the north-east of the post is zoned for Rural Resource District-2 (RD-2). The intent of the RD-2 district is to preserve the value of agricultural lands, woodlands, wetlands, and other resources and to maintain the rural character of this portion of the county. This district does, however, conditionally permit manufactured housing.

Lands to the northwest of the post in the City of Columbia are zoned for various commercial and residential purposes, as well as residential planned unit developments. To the south of the post in Richland County, land is zoned mostly for Rural District uses, permitting three-quarter acre residential lots.

Farther south around McEntire JNGB, land is also primarily Rural District with pockets of Rural Multi-Family and Multi-Family and commercial along Garners Ferry Road. South of the base, the county has industrial zoning in place. As noted earlier, the county has an Airport Height Restrictive

Overlay District around McEntire JNGB. The overlay imposes a series of development restrictions atop the base zoning to protect nearby airfield-related activity, including height limitations to ensure that structures do not encroach upon with primary zones, approach zones, clear zones, transitional zones, horizontal zones, and conical zone established around the base. This zoning also requires the appropriate marking and lighting of tall structures and prohibits any uses of the land or water that may produce electrical interference with aircraft navigational signals or radio communication, cause glare that could interfere with pilot vision or create bird strike hazards. The district does not set maximum residential densities or commercial intensities.

Future Land Use

The Future Land Use Map designates land to the north and north-west of Fort Jackson/MTC mostly for suburban residential densities and associated retail uses. The land directly east of the post to the south-east of Highway Church Road in Richland County, as well as land in Kershaw County is identified as rural.

To the south around McEntire JNGB, the Future Land Use Map reflects the eastward shift of the Columbia region's suburban/rural edge. Land to the west of Ridge Road is primarily in a suburban future land use category. Land surrounding the base and between the post and base east of Ridge Road is designated as rural.

The Southeast Richland Neighborhood Master Plan establishes a future development vision for a one mile radius around the intersection of Lower Richland Boulevard and Garners Ferry Road just west of the base. The Development Framework in the plan calls for a mix of uses in this neighborhood center, including larger lot estate single family lots to the east that blend with adjacent rural areas, clustered single-family lots, a core of commercial/ office and public uses focused on the intersection, and denser residential development to the west between Garners Ferry Road and Rabbit Run Road.

Current and Foreseeable Land Use Conflicts

As described earlier, the major operational issues that could create land use incompatibilities with nearby civilian development are:

- Peak noise levels of 115+ dB for typical large caliber activity at MTC;
- Peak noise levels for the 40 lb cratering charge of 115+ dB at the new Engineering Demolition Range on MTC;
- Low level helicopter operations between MTC and McEntire JNGB;
- Aircraft noise contours of 55+ dB around McEntire JNGB;
- Clear Zones and Accident Potential Zones around McEntire JNGB; and
- Controlled airspaces, such as approach and departures zones and low level flight paths around McEntire JNGB.

Fort Jackson/MTC Compatibility

Fort Jackson/MTC has current compatibility issues with:

- Areas to the east of the post in the 115+ db noise zones, particularly around McCords Ferry Road and James Watson Road directly adjacent to the post;
- Areas to the north in the 115+ dB noise zones, particularly along the Screaming Eagle Road and NE
- Shady Grove area near the Richland County and Kershaw County; and
- Areas directly south of the post, particularly along Leesburg Road east of Lower Richland Boulevard to McCords Ferry Road.

Current operations, especially the large caliber activity at MTC cause compatibility issues with scattered housing to the east, north-east and south of the post. Overall, 844 acres of land fall in severely affected noise areas with a peak exposure of 130 db. An additional 16,294 acres are within the less exposed 115 db zones. (See Figure 5.1).

Land east of the post is almost exclusively in rural residential/agricultural/timber uses with pockets of government/institutional, single family housing, and manufactured housing. Residential in this area, particularly in the form of poorly sound-insulated manufactured housing can trigger conflicts with the current noise environment. Land to the north-east also includes major pockets of manufactured housing proximate to severe noise impacts. Industrial and commercial uses in this area do not generate compatibility issues with peak noise, though scattered residential and manufactured housing lots along

Percival Road fall within the noise zone associated with moderate risk complaint. Land south of the installation is also primarily in rural residential/agricultural/timber use. Significant pockets of single family housing and manufactured housing along Leesburg Road, however, fall within areas of moderate noise impacts.

Land to the northeast in Kershaw County is zoned for Rural Resource District-2. This district conditionally permits manufactured housing, which could raise a compatibility issue due to the inability to include sound attenuating materials during unit construction. Land south of the installation falls in the Rural District classification of Richland County that could accommodate housing at a density in excess of recommended ranges for noise affected areas (See Figures 5.2).

Future land use designations indicate that suburban growth could spread farther east to the north of the post along Percival Road, increasing the risk of residential encroachment in moderately affected noise zones. Most of the rest of the land to the east, north-east and south of the post within noise areas remains designated for future rural uses that are generally consistent with nearby training activities (See Figure 5.5).

McEntire JNGB Compatibility

McEntire JNGB has current compatibility issues with:

- North Clear Zone and Accident Potential Zones I and II;
- South Clear Zone and Accident Potential Zone 1, particularly along Congaree Road and adjacent to the CSX rail line; and
- The 55+ dB noise contours, particularly to the north and west between Cabin Creek Road and Garners Ferry Road.

Overall, base operations cause compatibility issues with scattered uses to the north-west, south-east, and east. Land uses to the west and north warrant additional protective measures, such as sound attenuation and real estate disclosure to maintain compatibility. In total, approximately 6,000 acres of land is affected by off-base noise or air safety risks (See Figure 5.3).

Though easements are in place for a portion of the Clear Zone for Runway 14, McEntire JNGB does not have sole ownership of this highly restricted area to the north of the base. One residence exists within this zone, creating a potential land use conflict. Farther north, in the Accident

Potential Zone (APZ) I, a church and 13 housing units raise compatibility issues with aviation impacts. APZ II includes approximately 100 residences, which can be conditionally compatible under lower densities and with appropriate notification. The APZ II, however, does include a manufactured housing development that fails to meet compatibility guidelines related to both noise attenuation and density limitations.

While the Rural District zoning in the APZ areas is intended to maintain open spaces and rural character, permissible densities of one unit per .75 acres exceeds compatibility guidelines for APZ II (See Figure 5.4).

Similarly, McEntire JNGB does not own all of the land associated with Runway 32 to the south of the base. Land in this area is zoned for heavy industrial purposes and includes structures, triggering compatibility concerns. The APZ I currently contains 14 detached single-family houses and a church, a potential land use conflict. The less restrictive APZ II includes a compatible mix of undeveloped hardwood/pine and oak/pine forests, agricultural fields, and 16 housing units.

According to the 2008 AICUZ, approximately 150 housing units in the vicinity of McEntire JNGB fall within the 65+ dB noise contour, a level of exposure sufficient to generate conflicts with noise sensitive activities. Housing can be conditionally compatible with exposure of up to 75 dB if the real estate/development/planning community uses appropriate indoor sound attenuation and disclosure procedures. This JLUS, however, also uses the 55 dB contour to reflect the noisier environment associated with future JSF operations at the base. This broader noise contour encompasses more housing units, particularly pockets of existing residential between Garners Ferry Road, Congaree Road and Air Base Road. Portions of this affected area are zoned for multi-family residential, creating the possibility of additional unwanted noise exposure in neighborhoods.

Development that could interfere with airspace use, including the low level helicopter routes between MTC and McEntire JNGB is not a significant source of current incompatibility around the base.

Though the current economic downturn has weakened development pressure in the local market, an eventual upsurge in building activity combined with increasing infrastructure capacity and an eroding suburban/rural edge could significantly intensify land use conflicts to the west of

the base (See Figure 5.5). Current zoning, while effective in laying the regulatory groundwork for basic protection against uses inconsistent with aviation operations, may not be sufficient to prohibit denser development patterns that conflict with noise and air safety risks.

Overall Compatibility Assessment

In general, the installations have scattered existing land use compatibility issues related mainly to housing and manufactured housing units in noise areas east and north-east of Fort Jackson/MTC and in the air safety zones and noise contours to the north, south, and west of McEntire JNGB. Future Land Use designations and current growth trends supported by planned infrastructure investments indicate a likely eastward shift in Columbia's suburban development, potentially introducing more housing in noise affected areas to the north of Fort Jackson/MTC and just west of McEntire JNGB noise contours. While much of the land in the JLUS study area is zoned for rural purposes, current regulatory tools in Kershaw County and Richland County do not explicitly address key compatibility issues, such as the presence of manufactured housing in noise zones or the risk of denser residential patterns emerging in designated air safety zones or noise contours. The major corridors connecting the study area to Columbia, particularly Percival Road, Leesburg Road, and Garners Ferry Road are also vulnerable to the ongoing spread of linear commercial activity, which could catalyze future residential growth.



Existing Office along Percival Road

Fort Jackson / McEntire | Joint Land Use Study

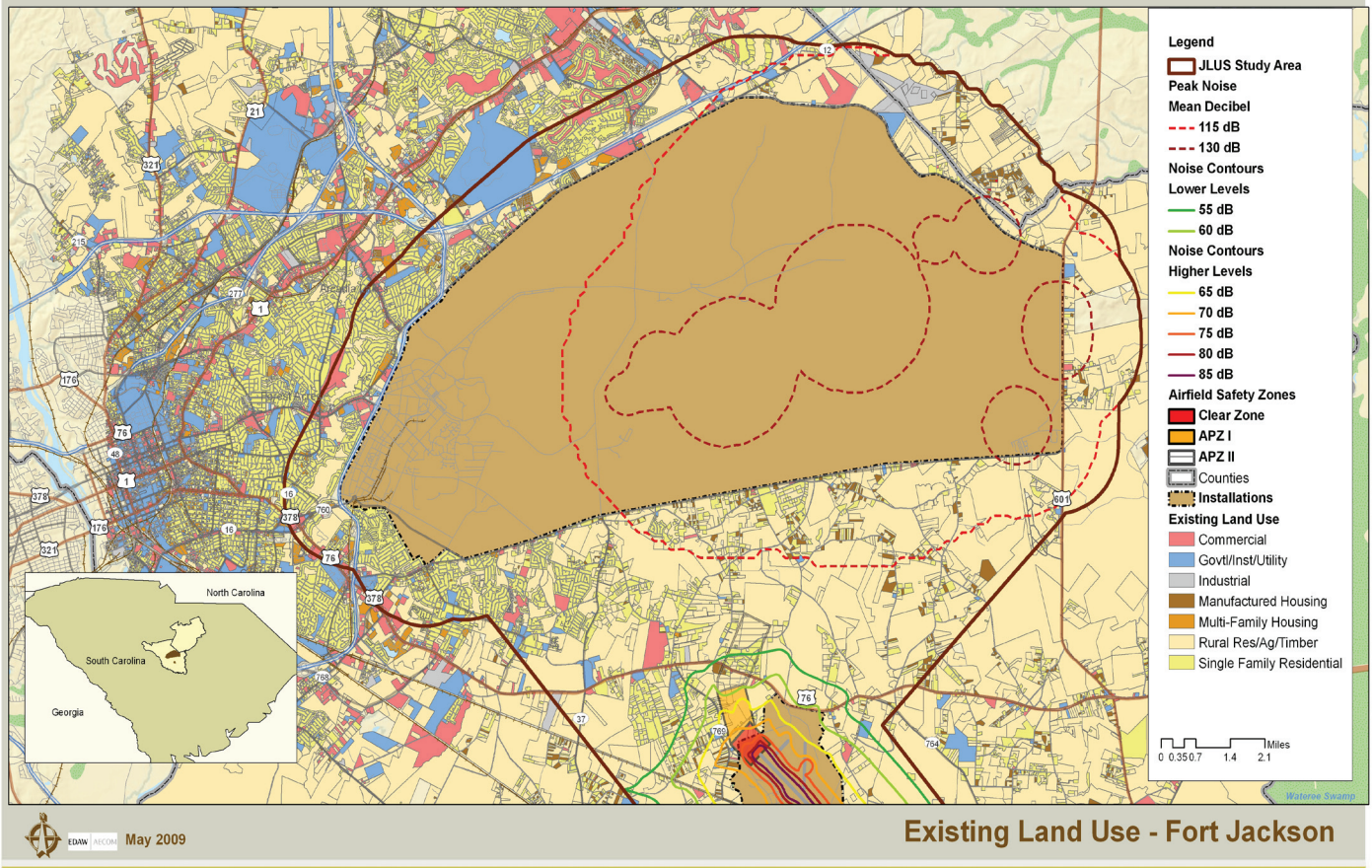


Figure 5.1: Existing Land Use- Fort Jackson/MTC

Fort Jackson /McEntire | Joint Land Use Study

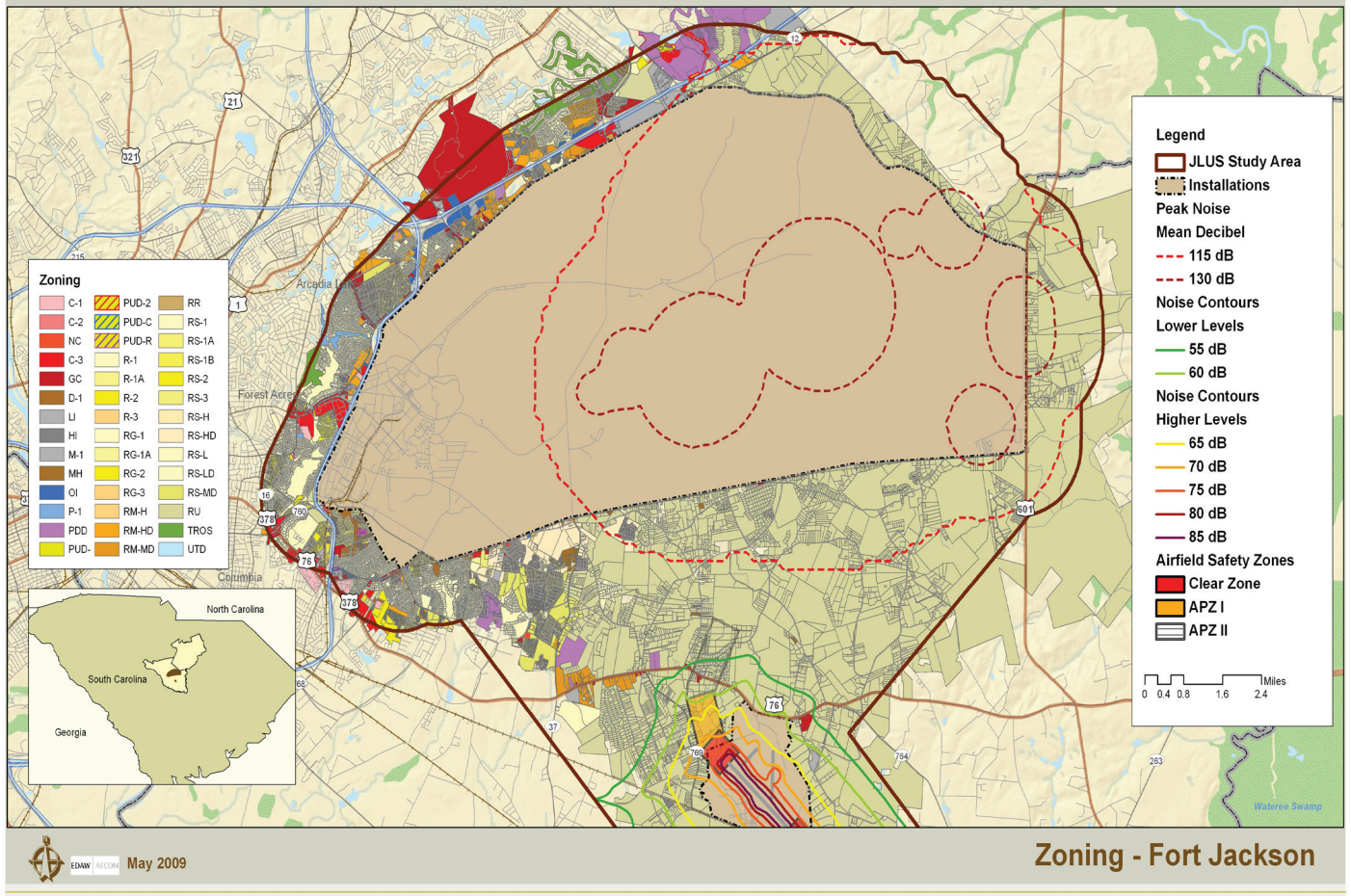


Figure 5.2: Existing Zoning- Fort Jackson/ MTC

Fort Jackson / McEntire | Joint Land Use Study

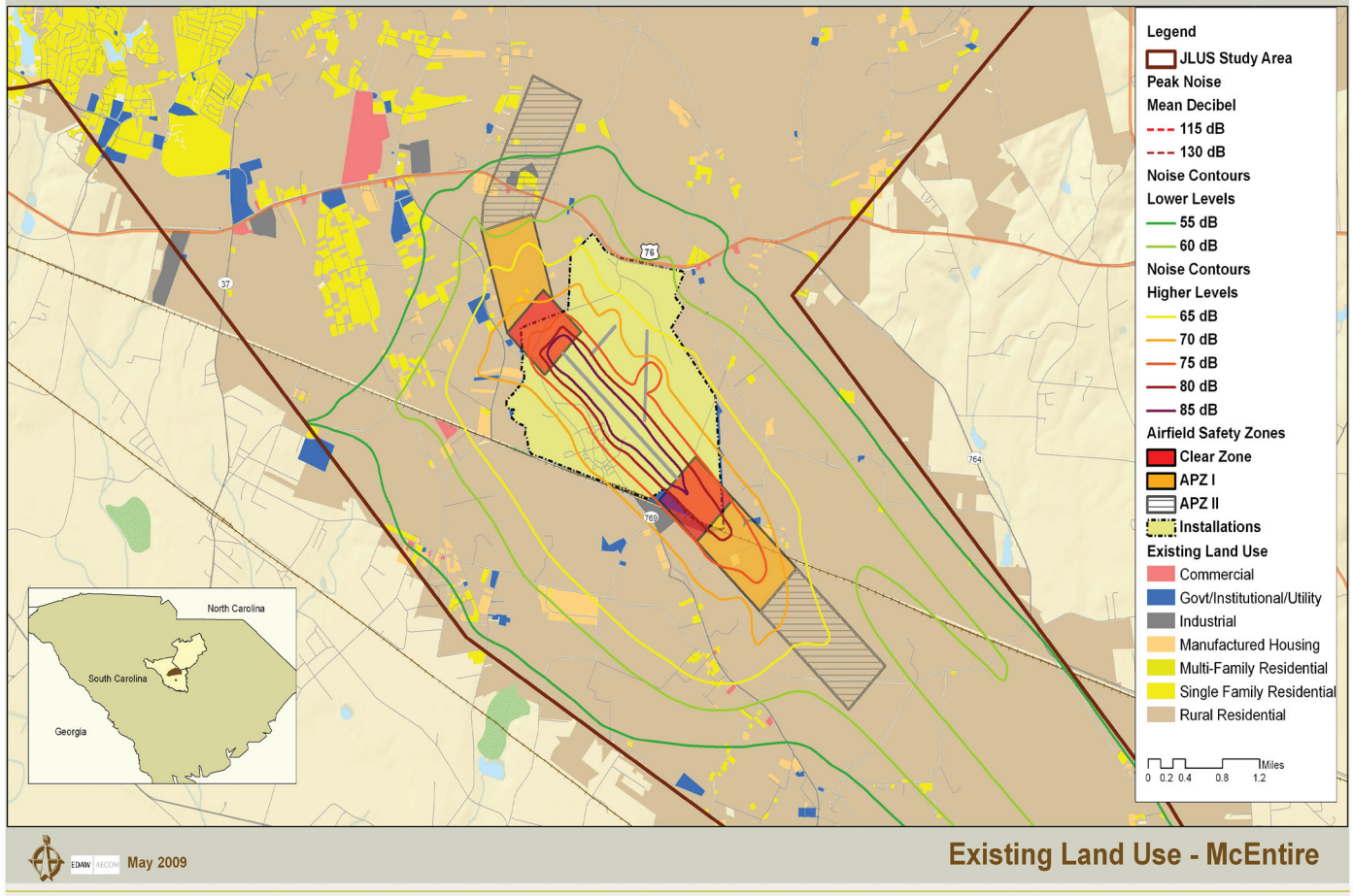


Figure 5.3: Existing Land Use - McEntire JNGB

Fort Jackson / McEntire | Joint Land Use Study

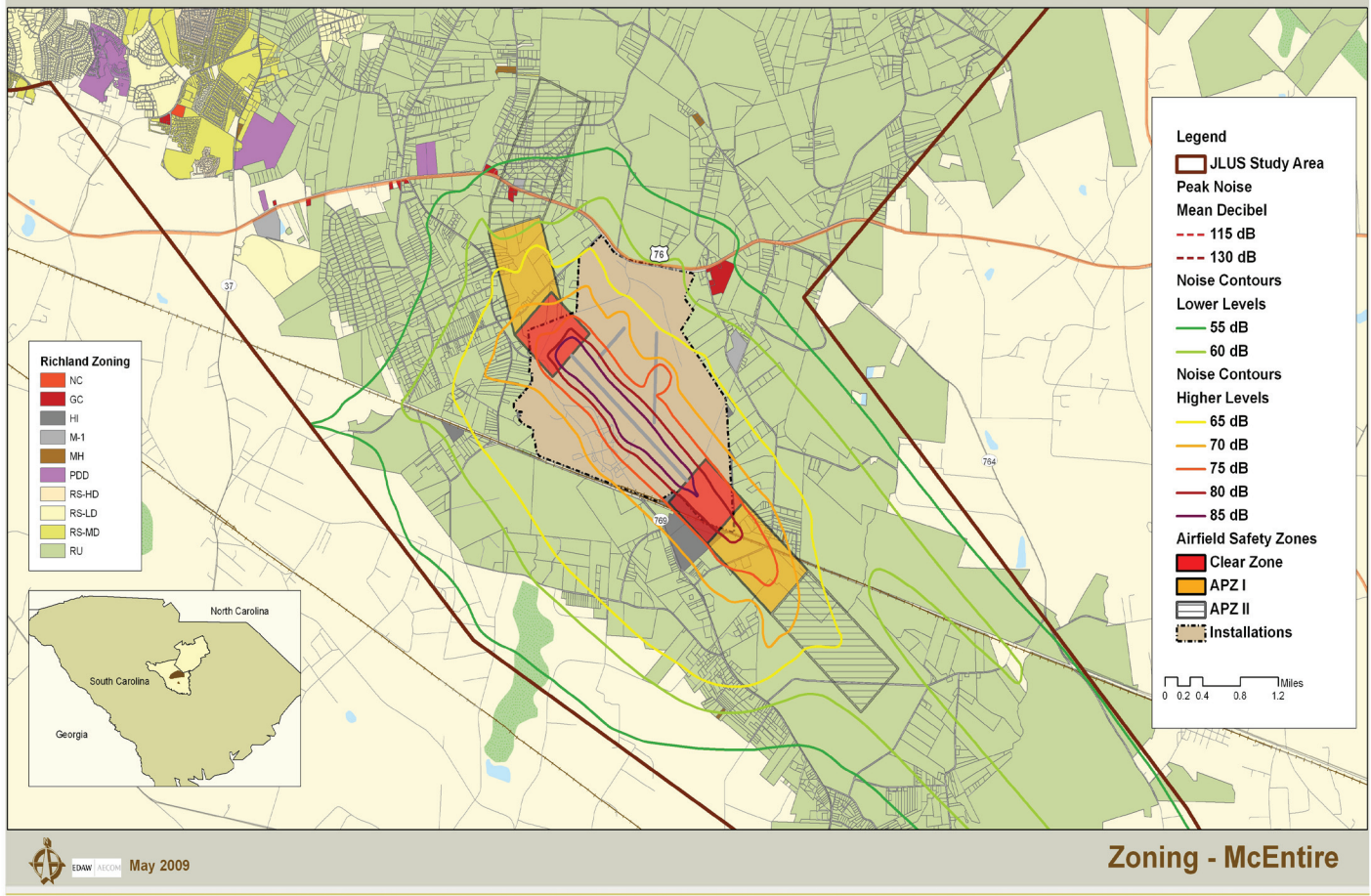


Figure 5.4: Existing Zoning- McEntire JNGB

Fort Jackson /McEntire | Joint Land Use Study

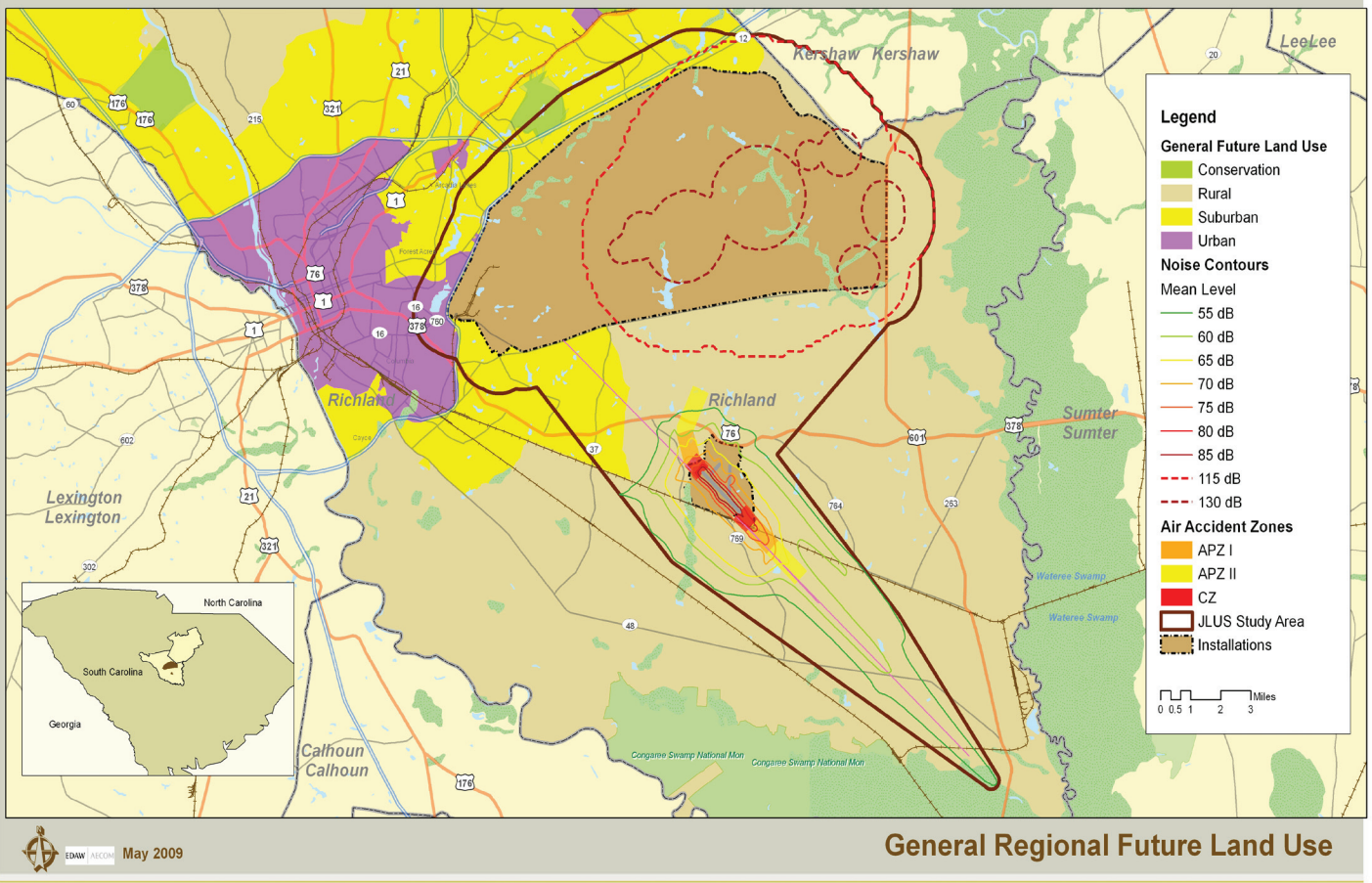


Figure 5.5: Regional Future Land Use in JLUS Study Area

6.0 Compatibility Tools



6.0 Available Encroachment Reduction Strategies

This section contains a menu of possible tools to help reduce future encroachment.

The following sections give background on a menu of possible approaches to address land use and operational issues, including physical adjacency to Fort Jackson/MTC and McEntire JNGB, the conservation of environmentally sensitive lands and rural areas near military activities, and noise and aviation safety impacts.

The Technical Committee evaluated all of the tools listed in this section and identified those options that are the most practical. Those selected strategies are the basis for the recommendations included in the Implementation Plan. While not all of the strategies described below are fully feasible in the region, they have value as long-term approaches to minimizing incompatible development and promoting quality growth around the installations. In other cases, the participating entities have partially adopted available strategies and the actions in the Implementation Plan focus on enhancing these current measures. As development conditions and mission impacts evolve, the JLUS encourages local officials and planners to revisit this broader list of potential strategies to further refine and strengthen their set of encroachment reduction tools.

6.1 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 the installation, while protecting the environment and wildlife habitats, maintaining agriculture/silviculture, and conserving open spaces and rural character.

As part of this strategy, the Midlands Area Joint Installation Consortium (MAJIC) has partnered with the Department of Defense (DoD) and the Congaree Land Trust and Conservation Fund to explore the purchase of conservation

easements from willing property owners within priority acquisition areas identified by the JCUB (Joint Compatible Use Buffer) study completed in September 2007. MAJIC has identified priority areas northeast and south of Fort Jackson and all around McEntire JNGB. The ACUB (for purposes of the Midlands initiative the program is referred to as JCUB) program has emerged as one of the most effective of the DoD sustainability initiatives in preventing encroachment around installations. The core implementation strategy of the program is to acquire conservation easements that prohibit incompatible development in perpetuity, while allowing the land to remain in private hands. While the restrictive covenant prohibits urban development, it accommodates low impact uses such as farming and forestry that do not pose a risk of interference with nearby training activities.

MAJIC is a strong alliance promoting the conservation of the local environment and the sustainability of the regional installations. Local governments and the individual installations can also participate in the conservation process by acting as direct cost-sharing partners in conservation easement purchases. Jurisdictions can also align their infrastructure and land use policies to reinforce the rural/agricultural character of areas near or within the designated JCUB, thus reducing development pressures and limiting price escalation of the land.

6.2 Market-Based Incentives

The State of South Carolina Comprehensive Planning Enabling Act of 1994 defines “market-based incentives” as measures that encourage private developers to meet the governing authority’s land use goals. According to the legislation, incentives include, but are not limited to:

- *Density Bonuses* allow developers to build at a density higher than residential zones typically permit. High densities allow developers to increase the affordability of housing units; developers can also improve housing affordability by paying into a local housing trust fund;
- *Relaxed Zoning Regulations* including, but not limited to, minimum lot area requirements, limitations of multifamily dwellings, minimum setbacks, yard requirements, variances, reduced parking requirements, and modified street standards;
- *Reduced or Waived Fees* including those fees levied on new development projects where affordable housing is addressed, reimburse permit fees to builder upon certification that dwelling unit is affordable and waive up to one hundred percent of sewer/water tap-in

fees for affordable housing units;

- *Fast-track Permitting* including, but not limited to, streamlining the permitting process for new development projects and expediting affordable housing developments to help reduce cost and time delays;
- *Design Flexibility* allowing for greater design flexibility, creating pre-approved design standards to allow for quick and easy approval, and promoting infill development, mixed use and accessory dwellings.

In May 2007, the South Carolina Legislature amended the Comprehensive Planning Enabling Act of 1994 through the Priority Investment Act (PIA). The PIA places additional emphasis and encouragement on the use of market-based incentives. Although the express purpose of this further encouragement is to facilitate traditional neighborhood design and the availability of affordable housing, rather than the intents of the JLUS, it does present a general indication that South Carolina is moving toward making market-based incentives a more common practice.

Two other market-based incentives exist in addition to those expressly mentioned in the Comprehensive Planning Enabling Act and the PIA that could be leveraged to limit encroachment around Fort Jackson and McEntire. These incentives have not seen broad use within South Carolina communities at this time, but could prove to be valuable tools in the future. These are:

- *Purchase of Development Rights (PDR)* programs allow a landowner to voluntarily sell the development rights of their property to an entity, typically a local government or not-for-profit community organization, such as a land trust. Many jurisdictions “bank” development rights that are purchased and then sell them to other developers who wish to develop other properties at higher densities than would be permitted without the additional development rights.
- *Transfer of Development Rights (TDR)* is similar to PDRs but is completely transacted in the private development market. With TDR, landowners are able to sell their development rights directly to another property owner or developer who wishes to develop their property at a higher density than is allowable under existing regulations.

Both PDR and TDR programs are completely voluntary and the value of development rights can be negotiated by all parties. The benefit to the landowner is three-fold: continued ownership and use of the property (within its new usage thresholds); the immediate financial benefit of selling the development rights; and the long-term property tax reduction of the land being valued at a lower tax rate.

If a landowner disagrees with the value offered for their development rights, they cannot be compelled to accept.

With regard to the use of TDR in conjunction with a JLUS process, a TDR program is being considered for the Marine Corps Air Station in Beaufort, South Carolina. In 2004, a JLUS was completed for the Marine Corps Air Station that recommended the implementation of a TDR program. Currently, the Lowcountry Council of Governments is seeking funding to establish a TDR bank to assist in transactions between land owners and developers. In February 2009, the South Carolina Military Base Task Force awarded the JLUS Implementation Committee \$250,000 for this purpose.

Overall, the TDR option poses more of an administrative challenge than the simple clustering of houses described later and requires strong market pressures for development combined with a limited supply of available land and relatively restrictive opportunities for rezoning at higher densities. Given the relatively rural character of the region, a TDR program may not be a feasible tool in the near-term, but may have long-term applicability in select areas, particularly in Lower Richland, as population growth continues.

6.3 Conservation-Based Incentives

A conservation easement is a voluntary, legal agreement between a landowner and a nonprofit conservation organization or government agency. Under the agreement, the landowner gives up certain rights, including subdivision and development, while maintaining ownership and use of the property. Conservation easements are enforced by the nonprofit organizations to which they are conveyed and typically permit continuation of traditional rural land uses such as farming, timbering, hunting, fishing, and game management. The conservation effect is accomplished through prohibitions or limitations on development. To qualify for tax benefits, a conservation agreement must serve one or more of the following purposes:

- Outdoor recreation or education of the general public
- Protection of significant natural habitat
- Preservation of farmland, forest land, or open space that will yield a significant public benefit or scenic enjoyment
- Preservation of historic property

A conservation easement must protect property forever to qualify for tax benefits. The agreement remains with the property in perpetuity. The following is a discussion on the tax implications of a conservation easement. A brief description is provided below; property owners should consult a Tax Attorney for further details.

Federal Tax Code

The gift of a conservation easement may generate substantial federal and state income, estate, gift and property tax savings. A taxpayer donating a conservation easement to a qualified charitable organization can generally expect to deduct from federal income taxes either 1) the fair market value of the easement up to 30% of the taxpayer's adjusted gross income or 2) the cost basis of the easement up to 50% of the adjusted gross income. Any contribution in excess of these limits may be carried forward and deducted for five years. Of course, the total value of the gift may exceed the amount that can be deducted over six years in which case the unused portion of the deduction is lost. It is possible to phase the gift of the conservation easement over time to avoid this outcome.

The fair market value of the easement is the difference between the land's value with the easement and the land's value without the easement, as determined by a certified land appraiser. For example, if a property is worth \$1,500,000 without an easement and \$900,000 with the easement, a charitable deduction of \$600,000 is generated. In other words, the value of the easement is \$600,000.

South Carolina Tax Code

In general, South Carolina conforms to the federal tax code concerning conservation easements and the deductibility of charitable donations, allowing for a deduction from state income taxes as outlined above. In almost all instances, South Carolina does not require a charitable deduction of a conservation easement to be "added back" for purposes of computing South Carolina taxable income. However, the General Assembly has placed a ban on charitable deductions for grants of conservation easements for golf courses. Taxpayers would have to "add back" any charitable deductions taken on federal tax returns for conservation easements used as golf courses.

In addition to the state income tax deduction, the South Carolina Conservation Incentives Act provides an income state tax credit equal to 25 percent of the deduction. The



Conservation easements can protect the endangered red-cockaded woodpecker habitat from destruction, enable nearby military missions to continue, and provide property owners with alternative revenue and tax benefits.

credit cannot exceed \$250 per acre of property to which the easement applies, and the total credit claimed may not exceed \$52,500 per year. Any unused credit may be carried forward until used. Additionally, any unused credit may be sold to another taxpayer upon approval from the Department of Revenue. Donors who are "land rich and cash poor" now have an avenue to sell their credits to receive immediate returns rather than carry their credits over an extended period. Twelve states have state-based credits designed to encourage the donation of qualified conservation easements. Only four of these states – Colorado, Virginia, New Mexico, and South Carolina – allow the transfer of credits to others. The South Carolina Conservation Credit Exchange (www.conservesc.com) provides buyers and sellers with a market to exchange credits. Federal and state income taxes apply to the income generated through the sale of credits.

In addition, the Conservation Incentives Act contains a provision for properties involved in forestry and silviculture practices that may preclude an income deduction under IRS rules. In certain cases, a state income tax credit is allowable even though no income tax deduction is permitted.

The South Carolina Scenic Rivers Act of 1989 contains additional incentives for riparian landowners. Landowners granting easements may deduct up to the fair market value of the easement. Additionally, land subject to a perpetual easement donated to the State of South Carolina is exempt from real property taxes.

Finally, the South Carolina Heritage Trust Program, administered by the Department of Natural Resources, exists to inventory, preserve, use, and manage unique and outstanding natural or cultural areas and features of South Carolina. Property owners may establish a heritage preserve by transferring property or granting a conservation easement. Recent IRS Private Letter Rulings have upheld grants of easements under the Heritage Trust Program as qualifying conservation easements.

Estate and Gift Taxes

In addition to the income tax charitable contribution deduction available for conservation easements, the US Congress has provided three estate tax benefits for qualifying conservation easements. The first benefit is that the property subject to a conservation easement is included in the decedent's estate at its fair market value, that is, as reduced in value by the easement. The second estate tax benefit, known as the Exclusion Rule, is an option to exclude from the decedent's estate any estate tax up to 40% of the remaining value of any property subject to a conservation easement. A third estate tax benefit, the Deduction Rule, allows the estate to take an estate tax charitable deduction. For example, assume a decedent left an estate with a gross value of \$2.5 million (comprised of \$2 million in real property and \$500,000 in other assets). Absent a qualified conservation easement, the estate tax liability is approximately \$680,000. Assume instead that a conservation easement worth \$750,000 is granted on the property. Under the Exclusion Rule, \$500,000 (40% of \$2,000,000 minus \$750,000) will be excluded from the estate. Under the Deduction Rule, the \$750,000 conservation easement will be entitled to an estate tax charitable deduction. After the application of these two rules, the estate tax liability will be approximately \$102,500,

or a savings of \$577,500.

Property Taxes

In accordance with the 2009 South Carolina Property Tax manual, unimproved real property subject to perpetual conservation easement will be classified as agricultural property for tax purposes. Agricultural lands are typically assessed at lower rates, allowing owners of a conservation easement to reduce their property taxes.

South Carolina Conservation Bank

The South Carolina General Assembly passed the South Carolina Conservation Bank Act in 2002. Funding commenced in 2004, and the Bank receives 25 cents from the state portion of each deed recording fee on the transfer of real estate. This is expected to generate approximately \$12 million per year for the Bank. The Bank exists to protect significant natural resource areas and wildlife habitats, protect water quality, farmlands, significant historical and archaeological sites, and enhance public access for outdoor recreation. The Bank is authorized to award grants to eligible trust fund recipients for the purchase of interests of land (either through the purchase of land or acquisition of a conservation easement). The Bank will only authorize loans or grants to purchase interests in land at fair market value. The qualified entity to which the easement was granted will be the entity that holds the easement as the Act prohibits the Bank from owning any land or easement.

Both market-based and conservation-based incentives are potential tools for protecting Fort Jackson/MTC and McEntire JNGB from encroachment by future development. Market-based incentives are available under South Carolina law, allowing landowners to retain the ownership and use of their property, while providing immediate financial and long-term tax benefits. However, to date most of these incentives have seen only limited use in South Carolina. There will most likely be a "cultural" challenge in implementing such incentives, as landowners and developers are not familiar with these tools. An education process will be necessary prior to these incentives having a large marketability, but such should be pursued along with the establishment of PDR and/or TDR programs.

Unlike market-based incentives, conservation-based incentives have been widely used throughout South Carolina. There are substantial federal and state tax benefits to incentivize landowners to execute conservation

easements. Due to the persistent complexities within the federal and state tax codes, it is imperative to seek expert financial and tax advice prior to any transaction. There are approximately 30 land trusts operating in South Carolina. These are the experts at helping landowners find ways to protect their land. A list of these trusts can be found at <http://sccbank.sc.gov/entitlandtrust.html>. Of note, the Congaree Land Trust focuses in Richland, Lexington, Kershaw, and Sumter counties.

6.4 Zoning

Zoning requires activities, such as industry, recreation, agriculture, and very low density/rural residential that maintain compatibility with post and airfield operations. Compatible activities generally avoid the concentration of people and show lower sensitivity to noise and other possible operational impacts. Zoning typically also regulates the effects of private land uses on nearby military training by, for example, minimizing light pollution or limiting the height of structures that may interfere with navigable airspace. As part of this strategy, local governments could create a specialized Military Activity Zoning District that governs uses within established noise zones contours and Accident Potential Zones.

Richland County has an airport overlay zoning district around McEntire JNGB that governs height and other potentially adverse impacts to aviation, such as bird aircraft strike hazards, light and other conditions that can interfere with pilot vision. The underlying zoning in the overlay, however, does not limit the intensity of development to levels consistent with current land use compatibility guidance. One strategy is to strengthen this existing zoning overlay with regulations that reduce future encroachment risks by regulating residential density, intensity of non-residential uses, and noise attenuation standards.

Additionally, the overlay is specifically geared toward preventing interference with aviation impacts and does not explicitly address possible land use conflicts. The prohibition of specific uses is the most direct method for preventing encroachment and is generally reserved for the most restrictive areas around the military installation including the aircraft safety zones and very high noise



Birds and other wildlife, like the raccoon, can be dangerous to aircraft

zones in excess of 70 dB. In general, such uses have the following characteristics:

- Have high people density or promote population concentration;
- Involve utilities and services required for an area-wide population and for which disruption would have an adverse impact (telephone, gas, etc.);
- Concentrate people who are limited in their ability to respond to emergency situations such as children, the elderly, the disabled; or
- Pose hazards to aircraft operations.

Specific examples would include schools and child care facilities, medical facilities, explosives manufacturing and storage, a power substation, and uses that attract large concentrations of birds (i.e. landfills and large retention ponds).

The land use compatibility tables produced by the Department of Defense and the Air Force, discussed in Section 5.1 of this report, identify various uses as “conditionally compatible,” meaning that some development may be an appropriate fit in a noise or air safety zone under specific circumstances. The local jurisdiction is empowered to determine the intensities that are locally appropriate. A ‘best practices’ review of military and civilian aviation zoning indicates that local governments rely on several basic approaches. The intent of all techniques described

below is to limit the number of people exposed to a nuisance (noise) or public safety hazard:

- Dwelling units per acre/ Minimum lot size as established by zoning district
- Number of people or employees assembled per acre at any one time
- Maximum lot coverage/Floor to Area Ratio (FAR) with height limitations
- Maximum square footage of building

The intent of any military-related overlay district is to prohibit specific uses or an intensity of uses that pose significant risks with adjacent training activities, but to accommodate viable economic development opportunities that provide for a reasonable use of land and tax revenue for the local jurisdiction. Examples of uses that can be a safe and economically viable fit near military installations include light industry and warehousing and distribution activities. Zoning provisions should be carefully calibrated to permit these compatible development types.

6.5 Outdoor Lighting Standards

The use of excessive and unshielded outdoor lighting can interfere with aircraft operations and training activities.

Night vision training, in which pilots and soldiers use night vision goggles (NVGs) or other types of night vision systems, is essential to the mission of the modern military and represents a significant tactical advantage for US forces. While prior generations of NVGs required at least some ambient moonlight, the current generation of goggles performs effectively without any background light. Overlighting and unshielded light thus both act as sources of light pollution that affect NVG equipment and may cause “white-out” visual conditions for the wearer.

Outdoor lighting systems, especially lighting associated with billboards, gas stations, major roadways, athletic fields, and large commercial or industrial uses, for example, allow significant light to travel upward into an otherwise darkened sky. The resulting “light pollution” can obscure pilot vision or interfere with the use of night vision training devices.

Regulations that minimize interference with the NVD environment do not require the strict prohibition of exterior lighting or the complete replacement of existing lighting fixtures. Instead, regulations focus on installing less



This shielded outdoor lighting fixture provides visibility where it is needed without unwanted light pollution

intrusive lighting applications either for new development or as part of the routine maintenance/replacement of public utilities. Communities can tailor outdoor lighting standards for the following property types and facilities to protect safety without imposing a burden on surrounding property owners:

- Commercial applications
- Utility company provided residential lighting systems
- Public streets, roads and highways
- Public structures
- Signs
- Temporary lighting

Typically, agricultural uses are specifically exempt from outdoor lighting regulations. The ordinance would regulate the installation of new lighting systems, modifications to existing lighting systems or the replacement of lighting fixtures for non-residential uses, common residential areas and street lights. Property owners outside of regulated zones are encouraged, but would not be required to comply with the lighting provisions. The standards at a minimum would require that exterior lights be shielded and downward

facing. More sophisticated lighting ordinances can regulate brightness (as expressed in footcandles) mounting height, setback, and asphalt paving surfaces (due to reflective glare).

Richland County zoning currently requires all lighting to be directed downward to minimize light pollution. The airport overlay also references these outdoor lighting standards.

6.6 Noise 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 dB or 55 dB around McEntire JNGB). Attenuation practices are most effective for areas subject to A-weighted noise, generated by aviation activity. Sound attenuation guidelines are available in the latest advisory document on: Guidelines for Sound Insulation of Residences Exposed to Aircraft Operations, 2005.

Noise Attenuation Practices

The Department of Housing and Urban Development (HUD), Department of Defense (DoD), and other Federal agencies have determined that noise exposure below 65 dB DNL (day-night average sound level) is generally compatible with residential development. Sites exposed to DNL between 65 dB and 75 dB are deemed “normally unacceptable” and generally require some noise attenuation techniques to mitigate the increased exposure. Sites exposed to DNL above 75 dB are “unacceptable” and may require special approvals and environmental review in addition to attenuation. The Environmental Protection Agency (EPA), Federal Aviation Administration (FAA), and DoD have established an interior DNL goal of 45 dB.

The Code’s current standard for air-borne sound transmission is based on a value known as Sound Transmission Class (STC). Walls, partitions, and floor/ceiling assemblies governed by the International Building Council (IBC) must have an STC of not less than 50 (45 if field tested). The IRC requires an STC of 45 when tested. These values represent the approximate decibel reduction. Generally speaking, if a 90 dB noise on one side of a wall/ceiling/floor is reduced to 45 db on the other side, that partition is said to have an STC of 45.

Building Code

South Carolina has adopted the building, residential, gas, plumbing, mechanical, fire, and energy codes as published by the International Code Council, Inc. Specific to the JLUS, the 2006 International Building Code (IBC) and the 2003 International Residential Code (IRC) are currently implemented in South Carolina. The IRC applies to single-family and two-family structures, while the IBC applies to three-family structures and greater, plus commercial applications. The Council has been charged with adopting and implementing the Code. These codes have a three-year cycle. Once implemented, the Code is enforced by local jurisdictions.

It should be noted that the IBC and IRC do not apply to manufactured housing. The Manufactured Housing Board administers the HUD Manufactured Housing Program, but has no authority to amend the construction standards.

In accordance with the 1997 Statewide Building Code Act, local jurisdictions are prohibited from promulgating their own codes. However, the Council may modify or amend the Codes by request of a local jurisdiction or professional association after a finding on the record that the modifications provide a reasonable degree of public health, safety, and welfare.

Local jurisdictions may request local modifications directly from the Council only if there is a verifiable physical or climatological basis for the change in that local region. For example, a less than desirable soil condition is a physical basis, such as a sand layer in a localized region that requires a deep pier foundation. A climatological basis is illustrated by the coast’s more stringent roofing requirements due to wind hazards related to hurricanes or tropical storms. Proximity to a military facility does not constitute a physical or climatological basis for an amendment. Therefore, any attempts to modify the Code based solely on proximity to a military facility cannot follow local Code modification procedures.

Another process by which the Code may be modified involves a request for a statewide change. Since this request does not stem from a localized condition, it does not have to meet the physical or climatological basis requirement. In the instance of a statewide request for change, a local jurisdiction or professional association may submit documentation in favor of a statewide Code modification. The Council must refer requests for statewide modification to the Code Study Committee for review and



Some building techniques, like spray insulation as compared to blanket insulation, provide better sound attenuation levels. Many of these techniques can also reduce long-term energy costs. Picture courtesy US Department of Energy

recommendation. The Committee performs the technical analysis of the request for modification, including testimony, studies, data, or other pertinent information. Committee meetings are held at least once during the Code adoption cycle, and all deliberations must be in a public session. A report of the Committee must be submitted to the Council with a recommendation for approval or disapproval. This recommendation is typically adopted by the Council.

The amendment process begins with a six-month comment period. The comment period for the 2009 Code begins on June 1, 2009. During this time, comments concerning the proposed codes are received by the Council's staff. The process continues with a second six-month hearing period. During this time, the Committee shall hold at least one public meeting, accept evidence and comment, and make a written recommendation to the Council for each proposed code modification. The Council will then hold a public meeting to review the Committee recommendations. The Council must meet at least once during the building code adoption cycle to review modification requests, and all

meetings are open to the public. A decision may be made upon a majority vote of the Council members. The Council may adopt, modify, or deny the modification requests and/or recommendations from the Committee. The statewide amendment process typically comprises an 18-24 month period within the Code's three-year cycle. The planned date of implementation for the 2009 Code is July 1, 2011.

There are no regulations against a local jurisdiction offering incentives to developers or contractors in exchange for meeting more stringent standards. For example, application review fees may be reduced if the contractor meets a higher sound transmission class (STC) requirement in the proposed construction. Ultimately, the decision to meet a higher standard still has to rest with the applicant. The local jurisdiction is prohibited from using disincentives or penalties, such as increasing application review fees if the proposed construction does not meet the local jurisdiction's desire for a standard higher than specified in the Code.

Since they are based on STC, current noise attenuation standards within the IBC and IRC are inappropriate for measuring the reduction of noise generated by jet aircraft. Since local jurisdictions are prevented from promulgating their own code, a statewide modification request would be required if any changes to the Code are sought. If a statewide modification is drafted, potential sources of supporting documentation can be found from several benchmark sources: HUD 51.1 Subpart B – Noise Abatement and Control, the Air Force Family Housing Guide, and the Naval Facilities Engineering Command's Sound Insulation Guidelines for Residences Exposed to Aircraft Operations.

To supplement a potential Code modification, local jurisdictions should consider an incentive approach to increase the noise attenuation characteristics of new construction.

6.7 Bird/Wildlife Aircraft Strike Hazard (BASH)

Aircraft collisions with birds and other wildlife annually cause millions of dollars in aircraft damage and may result in loss of aircraft and aircrews. Local conditions that enhance the potential for wildlife/aircraft strikes vary at each installation. Birds may flock to airfields or cause hazards en route; hazards may be seasonal or year round. Wildlife activity varies as local conditions change from crop selection, land use choices such as a landfill operation, or

creation of a wildlife refuge.

McEntire JNGB has a BASH plan tailored to meet the specific local hazards. Local governments can assist the military by adopting certain standards for detention pond design and limiting the location of sanitary landfills in the immediate area around McEntire JNGB. These standards could be adopted county-wide or within the specific area where low-flying operations occur.

6.8 Real Estate Disclosure

Disclosure requires the release of information on possible impacts (dust, smoke, noise/vibration, air safety zones) to prospective buyers or renters as part of real estate transactions for properties close to Fort Jackson/MCT and McEntire JNGB. Local governments can implement this tool by adopting a local real estate disclosure ordinance and seeking the participation of real estate professionals.

6.9 Avigation or Noise Easements

An avigation or noise easement is a form of disclosure aimed at the developer, rather than the individual buyer, during the initial stages of platting. An easement is the right granted to a third person to use private real property in a specified manner. An easement may be given, for example, for overhead wires, underground gas, power, sewer or storm drain lines, and sidewalks or roads. An avigation or noise easement is a property right acquired from a land owner that grants the right of military training activities in proximity to the affected parcel.

The easement runs in perpetuity with the deed to the property. Local governments increasingly rely on such easements to protect military operations against encroachment from nearby developing areas. Local governments, for example, may establish the granting of a noise easement by the developer as a condition for the approval of a proposed new home subdivision in areas subject to military training impacts, such as a high noise zone or Accident Potential Zone. The jurisdiction would then hold the easement for the life of the title.

6.10 Comprehensive Plans

As part of this option, local governments would include specific language on JLUS coordination as part of Comprehensive Plan development or updates. The

Comprehensive Plan establishes a firm legal basis for the implementation of compatibility actions and sets the policy framework to regulate development through local land use codes.

The plan can emphasize the relationship between the community and the military, the desire to promote cooperative land use planning and complementary land use goals, such as agricultural conservation and environmental protection, and clear guidelines about appropriate future land use in areas vulnerable to encroachment.

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 policy, and transportation and infrastructure policy.

The Kershaw County Comprehensive Plan does not currently contain language on the value of collaborative planning with Fort Jackson or reference land use policies designed to guide growth away from areas near the post. The Comprehensive Plan for the City of Columbia specifically references the Joint Land Use Study and notes that the recommendations of the report will be instrumental in guaranteeing the longevity of regional military installations and ensuring the protection of neighboring properties. Richland County is currently in the process of developing a Comprehensive Plan.

6.11 Corridor Plans and Small Area Plans

Small area plans and corridor plans can help shape appropriate development patterns around the military installation by establishing a specific framework for future land uses and designating areas suitable for growth. The best local example of this type of planning is the Southeast Richland Neighborhood Master Plan for a one mile radius around the intersection of Lower Richland Boulevard and Garners Ferry Road just west of McEntire JNGB. The Development Framework in the plan calls for a mix of uses in this neighborhood center, including larger lot estate single family lots to the east that blend with adjacent rural areas, clustered single-family lots, a core of commercial/ office and public uses focused on the intersection, and



Real Estate Disclosure allows potential buyers to be fully informed of potential impacts of nearby military operations.

denser residential development to the west between Garners Ferry Road and Rabbit Run Road.

Area corridors are particularly vulnerable to strip commercial development. Proactive corridor planning allows stakeholders to develop a long-term vision for the roadway under study and identify supporting land use policies that cluster development at key intersections and protect open space along strategic stretches of the corridor. Active planning is essential to counteract the common market tendency to evenly spread low density commercial in a linear pattern along road frontage.

Adherence to quality growth principles could, for example, reinforce green space separators between communities such as Eastover and Columbia and guide new commercial uses toward designated activity nodes at major intersections contiguous with developed areas and existing infrastructure. This nodal, rather than linear, form of growth could reduce commercial activity near McEntire JNGB and along the southern boundary of Fort Jackson/MTC. Corridor planning efforts are best conducted as a regional and multi-jurisdictional process that includes all affected communities and their key stakeholders.

6.12 Public Infrastructure

Local governments should consider the impacts of both public and private infrastructure installation/extension (e.g. water and sewer facilities) into noise and safety affected areas around Fort Jackson/MTC and McEntire JNGB. New infrastructure can induce or support incompatible growth patterns, such as denser residential development, especially if compatible zoning and land use guidelines are not in place.

Since capital investment decisions in turn influence private market location decisions, it is critical that local governments link their Work Programs and Capital Improvement Plans to compatibility goals. Installing infrastructure such as water, sewer and roads in planned growth areas and away from areas of operational impact clearly reduces the conflicts associated with denser development near the installation.

Regional Transportation Improvement Plans (TIP) should also reflect the need to limit road capacity projects in areas near the installation where development can interfere with the military mission. Community officials should also consult with military installation planners as part of the local planning and facilities programming decisions.

Conversely, the graduation ceremonies at Fort Jackson can have an impact on the surrounding transportation network. Regional transportation planners, local planners and military representatives should continue coordinating with the South Carolina Department of Transportation to plan and implement needed improvements near the main gate.

6.13 Communication

Under this approach, participating jurisdictions would develop appropriate mechanisms to ensure that residents, developers, businesses, and local decision-makers have adequate information about military operations, possible impacts on lands surrounding Fort Jackson/MCT and McEntire JNGB, procedures to submit comments, and any additional local measures to promote land use compatibility around the installations. Governments should use all available media, including posters, brochures, and city and county web sites to convey the information.

In addition to the actions of the local governments to communicate the impacts of Fort Jackson/MCT and McEntire JNGB, the Central Midlands Council of Governments could post maps on their website of

properties within the designated noise, safety and planning buffers. Ideally, land owners, developers, and prospective renters or buyers could access a searchable database of properties in these areas.

Similarly, the Army, South Carolina Army National Guard, and South Carolina Air National Guard would build on existing communication with its neighbors through methods such as publishing planned training schedules (training schedules change day-to-day) and operational guidelines for night training on the post web site; ensuring a continued role for a highly visible Fort Jackson/MTC and McEntire JNGB liaison to address noise and other issues and brief the communities; and generating community outreach materials on the post and base mission and activities, operational impacts and mapped noise contours, and other compatibility issues.

Regular prescribed burning that occurs on the installation



Noise easements required during zoning approval protect aviation activities, like those occurring at McEntire JNGB, from encroachment.

would be communicated through similar channels with the surrounding community. Because the state requires burning permits, the installations typically have prior knowledge of potential burn dates.

6.14 Coordination

Under this approach, local governments would promote collaboration by sharing information on specific community development proposals (rezonings and subdivisions) within designated buffers around Fort Jackson/MTC and McEntire JNGB. The State of South Carolina

requires local governments to consult with the military when zoning changes are proposed within 3,000 feet of a military installation. It should be noted that only the local government can approve or disapprove zoning and subdivision proposals. Fort Jackson/MTC and McEntire JNGB consult strictly on an advisory basis. The Technical Committee should explore if this mandated distance is sufficient for land use coordination purposes and consider designating a broader Planning Influence Area in which to consult on major development proposals.

A Memorandum of Understanding (MOU) is a “good faith” document that further establishes procedures for communication among affected parties and formalizes collaboration among multiple stakeholders, including South Carolina Department of Transportation and local utility providers. The MOU would list procedures for communication and establish primary points of contact for each stakeholder group.

6.15 Clustering

Clustering can be an effective tool in promoting land use compatibility around a military installation, particularly on larger parcels that straddle a noise or safety boundary. Under clustering (also known as conservation design), developers can separate the buildable areas of the parcel from areas that have a development constraint, such as noise or safety risk exposure. The district then allows more compact lots in the developable portion of the site in exchange for the permanent protection of land in the constrained area. This essentially becomes a density-neutral transfer of development rights onto another portion of the same parcel outside of areas adjacent to the post, targeted conservation areas or designated noise or air safety zones. Also as part of this strategy, local governments could require developers to use low impact site design principles, including the creation of green space/conservation buffers that can support noise and safety impact mitigation.

7.0 Implementation Plan



7.0 Recommendations

This section contains an analysis of existing policy gaps and an Implementation Plan for the civilian and military communities to improve compatibility planning.

The Technical Committee reviewed the menu of available tools in Section 6.0 based on locally appropriate criteria, including:

- Feasibility;
- Likely effectiveness;
- Resource availability for implementation;
- Ability to protect the military missions and sustainability of the two installations;
- Ability to protect the economic health of the region and individual property rights; and
- Ability to protect the health, safety, welfare, and quality of life in the region.

Their feedback is the basis for the detailed action steps described below.

The surrounding communities have adopted some compatibility practices to protect essential training and readiness activities at the post and base. A review of current measures, however, indicates gaps in the region's encroachment reduction approach, both in the form of geographic areas that remain unregulated and in existing policies that require additional regulatory provisions or communication procedures (See Table 7.1). The Prioritized Action Steps and Implementation Plan are intended to strengthen the critical policy challenges shown in Table 1 (highlighted in orange) and enhance the capacity of local governments and regional stakeholders to promote compatible land use in the years ahead.

The following sections organize these recommendations in three ways:

- **By Geography** – the Planning Areas section identifies the geographic areas around Fort Jackson/McCraday TC and McEntire JNGB in which the JLUS recommends land use controls and communication procedures.
- **By Priority and Type of Tool** – the Prioritized Action Steps section describes the most feasible and critical near-term measures to reduce encroachment risk, as well as longer-term tools and strategic efforts.
- **By Implementing Partner** – the Implementation Plan identifies key steps, responsible entities, and general timeframes and potential funding sources for compatibility tools. (See Attached Tables)
- **The Supporting Appendix** includes specific language, forms and samples to illustrate recommended practices.

ENCROACHMENT TOOL	RICHLAND COUNTY	KERSHAW COUNTY	CITY OF COLUMBIA	CITY OF FOREST ACRES
Airport Overlay	Airport Height Restrictive Overlay District (AP)	Airport Compatibility District (ACD)	Airport Height Restrictive Area (AP)	
Also applies to McEntire Joint National Guard Base	Yes, Section 26-103	No	No	N/A
Requires coordination or consultation with the installation for all zonings, subdivisions, or building permits when within close proximity	South Carolina law requires rezonings within 3,000 feet of a military installation or runway safety zone to consult with the military.	South Carolina law requires rezonings within 3,000 feet of a military installation or runway safety zone to consult with the military.	South Carolina law requires rezonings within 3,000 feet of a military installation or runway safety zone to consult with the military.	N/A
Includes lands within the 55 Ldn and greater Noise Contours	No	No	No	N/A
Provides definition of incompatible land uses and/or encroachment	No	No	No	N/A
Lists permitted and prohibited uses	No	No	No	N/A
Differentiates between noise and safety impact areas	Only lists Clear Zone and Approach zones. Does not include noise contours or Accident Potential Zones 1 and 2	No	No	N/A
Discusses residential density	No	No	No	N/A
Noise Attenuation				
Provides general noise attenuation requirements in airport impact areas	No	No	No	N/A
Provides specific noise attenuation standards based on location within impact areas	No	No	No	N/A
Which Building Code standards, if any, are used for noise attenuation?	South Carolina law prohibits the adoption of different building codes from the state standard unless in specific areas such as coastal regions	South Carolina law prohibits the adoption of different building codes from the state standard unless in specific areas such as coastal regions	South Carolina law prohibits the adoption of different building codes from the state standard unless in specific areas such as coastal regions	N/A
Electromagnetic or Radio Frequency Interference				
Specifically prohibits interference with airport electromagnetic and radio frequency communications links	Yes, general statement in Section 26-103(c)	No	Yes, general statement in Section 17-307(c)	N/A

Table 7.1: Review of Existing Compatibility Tools and Policy Gaps

ENCROACHMENT TOOL	RICHLAND COUNTY	KERSHAW COUNTY	CITY OF COLUMBIA	CITY OF FOREST ACRES
Height Standards				
Other than FAA requirements, additional requirements related to airports	Yes, specific approaches controlled for Downtown Airport and McEntire. Permit required in most zones, but some exceptions for structures shorter than 75 feet in outer approach zones. Sec 26-103(d)	No	Yes, specific approaches control structures and trees Sec 17-307(d)	N/A
Bird Strike Hazards				
Specifically addresses bird strike hazards	Yes, general statement in Section 26-103(c)	No	Yes, general statement in Section 17-307(c)	N/A
Lighting Standards				
Light spillage addressed	Yes, Section 26-177.	No	Generally not permitted	No
Specific Light Ordinance	Yes, Section 26-177. Applies to entire county. Lights must be directed downward	No	No	No
Specific lighting standards related to safety for airplane maneuvering	Yes, general statement in Section 26-103(c)	No	No	No
Specific lighting standards related to night vision and military training	No	No	No	No
Avigation Easements				
Easements required as condition of approval of request	No	No	No	No
Noise Easements				
Easements required as condition of approval of request	No	No	No	No
Flexible Development Patterns				
Creates or has available a conservation subdivision ordinance	Yes, Conservation Overlay District, but only applies to water-sensitive lands and does not allow clustering. Sec 26-104	Yes, Conservation Overlay District- floodprone areas and open space. Sec 3-4	No. Zero lot-line developments permitted, but not true cluster or conservation subdivisions.	No

Table 7.1 (cont.): Review of Existing Compatibility Tools and Policy Gaps

ENCROACHMENT TOOL	RICHLAND COUNTY	KERSHAW COUNTY	CITY OF COLUMBIA	CITY OF FOREST ACRES
Zoning Categories				
List the zoning categories and maximum density currently permitted in affected areas around Fort Jackson, McCrady Training Center and McEntire Joint National Guard Base	• RU- Rural permits 1 detached dwelling per acre (du/acre) • RS-LD Low Density Residential permits up to 3.6 du/acre • GC- General Commercial, permits up to 16 du/acre • M-1-Light Industrial • HI- Heavy Industrial • MH- Manufactured Home permits up to 6 du/acre • RM-HD- Residential Multi-Family High Density	• RD2- Rural District permits 1 detached sf dwelling per acre	Multiple	• C-1, Neighborhood Commercial • OI, Office Institutional • RS-1, permits up to 3 du/acre
Disclosure				
Requires property owners to disclose location within Noise Contours, APZs, or Clear Zones to potential buyers or renters	South Carolina law requires real estate disclosure form, which has area for nuisances included noise and smoke	South Carolina law requires real estate disclosure form, which has area for nuisances included noise and smoke	South Carolina law requires real estate disclosure form, which has area for nuisances included noise and smoke	South Carolina law requires real estate disclosure form, which has area for nuisances included noise and smoke
Comprehensive Plan				
Comprehensive Plan updated on a regular basis either by adopted policy or practice	Yes; currently under development	Yes, every 10 years. Recently adopted in 2007	Yes. Recently adopted in 2008	Yes. Recently adopted in 2008
Plan includes language supporting compatible land use planning surrounding Fort Jackson/ McCrady and McEntire JNGB	Yes, general statement refers to the JLUS process and recommends implementation of it.	No	Yes, mentions the JLUS process	No
Future Land Use Plan reflects desire for compatible land uses surrounding the military installations	No, the plan does not attempt to guide specific land uses, but does recognize the importance of protecting the installations.	No	Yes, Military Buffer zone permits low density residential and open space	No
Plan is specifically tied to the Capital Improvement Plan or to individual capital improvement projects	The plan includes the Priority Investment Element that lists the Capital Improvement Plan. No specific link between the projects on the list and the Comp Plan goals	The plan states a goal of coordinating infrastructure with development (LU-4), but the CIP is not attached to the Comprehensive Plan	The plan includes Priority Investment Element that lists the Capital Improvement Plan. No specific link between the projects on the list and the Comp Plan goals	A Capital Improvement Plan is not included in the comprehensive plan

Table 7.1 (cont.): Review of Existing Compatibility Tools and Policy Gaps

ENCROACHMENT TOOL	RICHLAND COUNTY	KERSHAW COUNTY	CITY OF COLUMBIA	CITY OF FOREST ACRES
Future Land Use Categories				
List the future land use categories and uses recommended in affected areas around Fort Jackson, McCrady Training Center and McEntire Joint National Guard Base	• Rural permits 1 du per 0.75 acre • Conservation- Congaree Refuge	• Economic Development permits up to 4 du/acre • Residential Development permits up to 1 du/acre	• Fort Jackson Buffer Zone permits low density development and open space • Urban permits medium/high density • Suburban permits low/medium density • Rural permits very low density	• Commercial • Residential
Local Coordination Agreements				
Local jurisdictions have signed agreements with each other pertaining to infrastructure service delivery or future annexations and potential land uses/ densities on those properties	No	No	No	No
Local jurisdictions have signed a Memorandum of Understanding with each other, Fort Jackson/McCrady Training Center and McEntire Joint National Guard Base concerning communication procedures	No	No	No	No
Education and Outreach				
Local Jurisdiction has an outreach program about military impacts on surrounding properties	No	No	No	No
Implementation and Enforcement				
Local Jurisdiction has an implementation and/ or enforcement body that regularly addresses encroachment and compatible land use decisions	No	No	No	No

Table 7.1 (cont.): Review of Existing Compatibility Tools and Policy Gaps

7.1 Planning Areas

Members of the JLUS Technical Committee identified a series of overlapping geographic areas around Fort Jackson/McCrary and McEntire JNGB that warrant special coordination procedures or land use and development controls due to their proximity to training and readiness activities. Each of the planning areas, also referred to as a Military Activity Zones (MAZ), is exposed to noise, the risk of an aircraft accident, and/or other operational impacts related to the military mission. When combined, these planning areas form the spatial framework for compatible land use planning around the installations as shown in Figure 7.3. The Prioritized Action Steps in Section 7.2 contain a series of regulatory and communication tools that apply within these planning areas.

The remainder of this section describes each planning area and its corresponding land use, development intensity and communication recommendations. Table 7.2 summarizes permitted land uses and development intensities by MAZ. These development standards form the basis of the zoning overlay provisions that top the list of prioritized actions for the region (See Appendix for Model Zoning Overlay).

The descriptions below begin with the geographically broadest and least restrictive of the designated planning areas and proceed to areas with the highest risk of serious operational impact and, therefore, the most limiting land use guidelines. These areas overlap so that the restrictions are cumulative. Property falling anywhere within the broadest planning area would be subject to basic provisions related to coordination, communication, and performance standards. Property that is closer to the post or base may be subject to additional measures related to noise attenuation and height and density restrictions.

Military Activity Zone 6 (MAZ 6)

The Military Activity Zone Area or MAZ 6 is inclusive of all noise, air safety and buffer zones, encompassing property that is close enough to the post or airfield to affect or be affected by military operations. This broad zone does not contain specific restrictions on land uses or development intensities, but instead promotes the use of general coordination and communication tools and basic performance standards to reduce conflicts that could compromise local safety and quality of life.

Recommended measures for the Military Activity Zone Area 6 (MAZ 6) include:

- **Avigation and/or noise easements.** All applications for subdivision approval and/or building permits for any structure requiring plan approval should include the dedication of an avigation/noise easement to the city or county. The dedicated avigation easement allows property owners to develop land in accordance with the applicable zoning district and regulations. However, Fort Jackson/McCrary and McEntire JNGB would receive a clear right to maintain flight operations over the land or to conduct noise-generating training activity within proximity of the parcel. This easement is shown on the plat and incorporated into each deed transferring title to the property. (See Appendix)
- **Area of Military Impact Notification.** All subdivision plats and property deeds inside the Military Activity Zone 6 should contain language on possible exposure to noise and military overflights.
- **Real Estate Disclosure.** All real estate transactions within the MAZ 6 should require a form disclosing the proximity of the site to the military installations. (See Appendix)
- **Performance Based Standards.** While the land uses associated with underlying zoning would remain permissible, zoning should regulate the performance of activities to prevent impacts that could interfere with aircraft flight corridors or firing range operations:
 - » **Height Restrictions.** Structures should not exceed the heights indicated in the section on approach and departure zones. Richland County can reference compatibility with its existing Airport Height Restrictive Overlay District.
 - » **Noise Attenuation.** All new residential buildings would be constructed with sound protection based on the level of noise exposure within the 55 Ldn or higher noise contours of McEntire JNGB or the PK 115 dB or higher noise contours of Fort Jackson/McCrary TC. As noted later, South Carolina state law requires that local governments request approval to modify existing codes. Given the difficulty of attenuation sound in manufactured housing, local governments should also prohibit manufactured home parks within the 55 Ldn or higher noise contours of McEntire JNGB or the PK 115 dB or higher noise contours of Fort Jackson/McCrary TC.
 - » **Outdoor Lighting Standards.** Uses should install less visually intrusive lighting applications and illuminated signs to minimize the risk of

light pollution and glare that may interfere with pilot or soldier vision during night vision device training activities. Richland County can reference compatibility with Section 26-177 of the zoning ordinance.

- » **Emissions.** Land uses should not produce smoke, gas, steam, glare or other visual emissions that can interfere with the safe use of runways, flight corridors or training range areas at the installations.
- » **Electronic Interference.** Land uses should not produce electronic interference with navigation signals or radio communication between the airfield and the aircraft.
- **Aircraft-wildlife strike hazards.** Constructed areas, such as retention ponds, roosting habitats on buildings, landscaping, putrescible waste disposal operations, wastewater treatment plants, agricultural or aquacultural activities, surface mining, or wetlands should achieve adequate separation from runways, loading ramps, or aircraft parking areas. (See Appendix)
- **Consultation with the Military.** Current South Carolina State Law mandates that planning entities provide information to the military installation commander on a land use plan or zoning proposal for property that is within 3,000 feet of an installation, Clear Zone, or Accident Potential Zones I and II. As shown in Figure 7.2, this 3,000-foot buffer does not encompass all land affected by noise or low-level helicopter flights. To ensure adequate coordination in all areas that could affect or be affected by military operations, local governments should expand consultation to the full extent of the MAZ 6. Consultation should specifically include development permits, such as zoning applications (except agriculture), major subdivision plats (5 lots or more), changes to the future land use map that result in more intense uses, corridor or neighborhood plans, planned unit developments or special use permits. The local governments and the Army, South Carolina Army National Guard, and Air National Guard should formalize these consultation procedures as part of a Memorandum of Understanding with the MAZ 6 established as the appropriate boundary for general coordination and information sharing. (See Appendix)
- **Local Coordination.** Many of the impact areas, particularly near McEntire JNGB are in unincorporated Richland County, but within proximity to the City of Columbia's existing water and wastewater service areas and therefore subject to future annexation pressure. To ensure a coordinated approach to annexation and infrastructure extension, the City of Columbia and Richland County should consider a

Joint Boundary and Service Delivery Agreement in the transitional urban-rural lands north of McEntire JNGB in the MAZ 6. This may also be an appropriate area in which to explore establishing an extraterritorial jurisdictional boundary that plans for the orderly expansion of future urban growth. The intent of any agreement and extraterritorial jurisdictional boundary would be to encourage a more contiguous growth pattern, reduce the risk of scattered and disconnected pockets of development and promote densities that are appropriate for nearby military operations and rural lands.

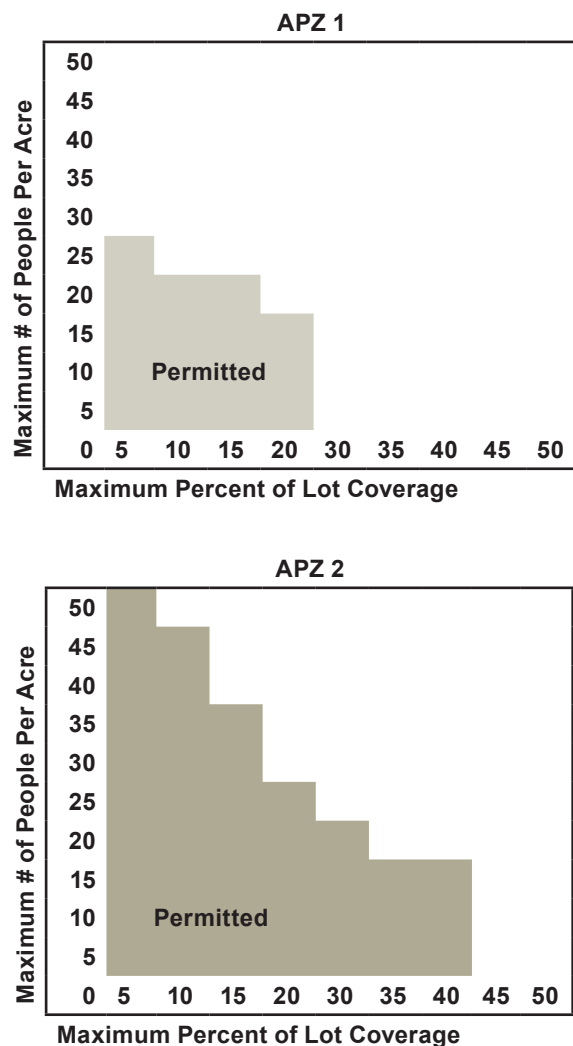


Figure 7.1: Sliding Scale of Employment Density and Lot Coverage in McEntire APZs.

Fort Jackson/MTC Perimeter Buffer (Military Activity Zone 5 or MAZ 5)

The Fort Jackson/McCraday Perimeter Security Buffer or MAZ 5 includes lands that are within 1,000 feet of the installation boundary. The intent of this zone is to restrict taller buildings and denser development that could compromise Anti-Terrorism/ Force Protection (AT/FP) objectives. Similar to the concept of “standoff distances” used in building designs on installations, the 1,000-foot separation around the installation assists in establishing a visually permeable and physically secure buffer that reduces the vulnerability of personnel to outside attacks.

Recommended measures for the Fort Jackson/McCraday Perimeter Security Buffer or MAZ 5 include all of the provisions for MAZ 6, as well as:

- **Residential Density Limitations.** While some residential development can be compatible in this zone, adjacency to the installation and the greater likelihood of exposure to noise from on-post activities conflicts with denser housing patterns. Zoning should restrict multi-family and manufactured home parks within the buffer and set a maximum density of two detached single-family units per acre.
- **Height Limitations.** Zoning should also limit the height of buildings in the MAZ 5 to 35 feet to prevent direct weapons firing from vantage points outside of the installation.

McEntire Perimeter Buffer (Military Activity Zone 4 or MAZ 4)

Similar to the MAZ 5, the McEntire Perimeter Security Buffer (MAZ 4) restricts taller buildings or denser housing patterns on lands within 1,000 feet of the base boundary.

Recommended measures for the McEntire Perimeter Security Buffer or MAZ 4 include all of the provisions for MAZ 6, as well as:

- **Residential Density Limitations.** While some residential development can be compatible in this zone, adjacency to the installation and the greater likelihood of exposure to noise from aircraft and on-base activities conflicts with denser housing patterns. Zoning should restrict multi-family and manufactured home parks within the buffer and set a maximum density of two detached single-family units per acre.
- **Height Limitations.** Zoning should also limit the height of buildings in the MAZ 5 to 35 feet to prevent direct weapons firing from vantage points outside of the installation.

McEntire Accident Potential Zones 2 (Military Activity Zone 3 or MAZ 3)

This planning area includes lands off of Runway 14/32 at McEntire JNGB. These three-dimensional spaces which project north and south of the base have a statistically higher risk of an aircraft accident than surrounding land. The Accident Potential Zone 2 or APZ 2 has the lowest safety risk of the three zones designated around the airfield, but the severity of impact in the event of an accident and proximity to the runways warrant efforts to limit the number of people and structures in the APZ 2. The goal of intensity limitations in any of the accident potential zones is two-fold: to limit the number of people exposed to an accident and to maintain some open land, thus providing greater flexibility to the pilot during an emergency landing.

Recommended measures for the McEntire JNGB Accident Potential Zones 2 (MAZ 3) include all of the provisions for MAZ 6, as well as:

- **Residential Density Limitations.** Zoning should prohibit denser development patterns such as multi-family units and manufactured home parks that would expose more people to an accident. Compatibility guidance indicates that some housing can be a safe fit in the APZ 2. The MAZ 3, therefore, can accommodate single-family detached housing at a maximum density of one dwelling unit per acre.
- **Commercial Intensity Limitations.** Zoning should also specifically prohibit those commercial, institutional or industrial uses that tend to concentrate people within a structure on a regular basis. Examples would include sports stadiums, auditoriums, churches, schools, hospitals, assisted living and other medical facilities, hotels, restaurants, and strip commercial centers. To control the scale of uses, zoning should specify a maximize size for likely gatherings of people within permitted facilities and also regulate the size of buildings and lot coverage. Zoning for MAZ 3 should limit the size of gatherings to 50 people per acre and set a maximum building footprint 15,000 square feet and a maximum lot coverage of 35 percent.
- **Industrial Intensity Limitations.** Less labor intensive light industrial uses, such as warehousing and distribution are more compatible with the air safety risks of APZ 2. Zoning should be more flexible with industrial activity, permitting a sliding scale that allows higher lot coverage for buildings housing relatively fewer employees. The maximum number of employees per shift should not exceed 50 and building lot coverage should not exceed 40 percent. The sliding scales are shown in Figure 7.1.

McEntire Accident Potential Zones 1 (Military Activity Zone 2 or MAZ 2)

Given its closer proximity to the runway, MAZ 2, which encompasses the Accident Potential Zones 1 (APZ 1), around McEntire JNGB has a statistical higher risk of an aircraft accident than MAZ 3. Compatibility guidance thus recommends against any residential use in this zone and the scale of permissible commercial and industrial uses is also lower.

Recommended measures for the McEntire JNGB Accident Potential Zones 1 (MAZ 2) include all of the provisions for MAZ 6, as well as:

- **Residential Density Limitations.** Zoning should prohibit all residential uses in the zone.
- **Commercial Intensity Limitations.** Zoning for MAZ 2 should restrict uses that routinely concentrate people and limit the size of likely gatherings to 25 people per acre. Commercial and industrial uses should not exceed a maximum building footprint 8,000 square feet and a lot coverage of 20 percent.
- **Industrial Intensity Limitations.** The maximum number of employees per shift should not exceed 25 and building lot coverage should not exceed 20 percent.

McEntire Clear Zones (Military Activity Zone 1 or MAZ 1):

Given the air safety issues associated with Clear Zones, the MAZ 1 is the most restrictive of the designated planning areas around the base and thus requires a complete prohibition of uses and structures with the exception of roads, underground utilities, some agriculture (except livestock) and permanent passive open space. While much of the MAZ 1 lies on base property, some of this highly constrained land is in private ownership. The JLUS recommends that the Air Force and Air National Guard pursue efforts to secure aviation easements on remaining privately owned land in the Clear Zones.

Recommended measures for the McEntire JNGB Clear Zones or MAZ 1 include all of the provisions for MAZ 6, as well as:

- **Residential Density Limitations.** Zoning should prohibit all residential uses in the zone.
- **Non-Residential Intensity Limitations.** Zoning for MAZ 1 should prohibit all uses and structures with the exception of some agriculture, open space, roadways and underground utilities.

Noise and air space issues related to both range training and aircraft activity cut geographically across all of the Military Activity Zones or MAZs described above. These planning areas are the appropriate basis for development standards that govern sound attenuation, structure height, outdoor lighting, and the design of potential wildlife attractants. The model zoning overlay in the Appendix incorporates noise contours and approach and departures zones among the regulatory provisions that affect all MAZs.

All Noise Contours

In those areas with average or peak noise exposure sufficient to affect quality of life (55 DNL or higher around McEntire JNGB or PK 115 dB or higher around Fort Jackson/McCrady) the JLUS recommends a combination of notification and siting standards to minimize conflicts. The noise contours are part of the MAZ 6 and would thus also trigger provisions for real estate disclosure, noise easements, and plat notification.

Local governments should collaborate with school districts to site new educational facilities outside of noise zones. Jurisdictions should emphasize use of a flexible planned unit development approach for large tracts that straddle the noise contours. Site plans can set aside open space in noise exposed areas and cluster housing units away from sound generating activities on the post or near the airfield.

McEntire Approach/ Departure Zones

The approach and departure zones represent three-dimensional areas around McEntire JNGB. The primary purpose of this area is to minimize physical intrusions into flight paths. These zones are also appropriate planning boundaries in which to govern activities that could obscure pilot vision, such as outdoor lighting or uses that emit airborne substances. These zones are also critical areas in which to control uses that attract birds and wildlife posing a strike threat to aircraft.

The JLUS recommends that Richland County continue to reference its existing outdoor light code and Airport Height Restrictive Overlay District as part of the model zoning overlay. The Appendix contains a model ordinance that Richland County and surrounding jurisdictions can adopt to meet additional needs in this zone.

PLANNING AREA	COORDINATION TOOLS	PERFORMANCE STANDARDS	USE LIMITATIONS		
			RESIDENTIAL	COMMERCIAL	INDUSTRIAL
MAZ 6	A	D	No intensity or use restrictions		
MAZ 5	A	D	MF; 2 du/acre maximum	Max. height of 35 ft or 3 stories	
MAZ 4	A	D	MF; 2 du/acre maximum	Max. height of 35 ft or 3 stories	
MAZ 3	A	D	MF; 1 du/acre maximum	No more than 50 people per acre; Max. building footprint 15,000 sf & min. side yard setback of 10' Max. coverage of 35%. Strip commercial prohibited and Planned Development encouraged	Use Sliding scale of employment/coverage. Max. coverage 40% with 50 employees per shift. Planned Development encouraged
MAZ 2	A	D	Not permitted	No more than 25 people per acre; Max. building footprint 8,000 sf & min. side yard setback of 15' Max. coverage of 20%. Strip commercial prohibited and Planned Development encouraged	Use Sliding scale of employment/coverage. Max. coverage 20% with 25 employees per shift. Planned Development encouraged
MAZ 1	A	D	Not permitted	None permitted	None permitted
Noise Contours	B	D	No intensity or use restrictions		
Approach/ Departure	C	E	No intensity or use restrictions		

A: Real Estate Disclosure; Consultation with military; Avigation easement; Inter-local coordination

B: Real Estate Disclosure; Consultation with military; Avigation easement; Inter-local coordination; Sound attenuation for new residential Construction

C: Consultation with military

D: Shielded outdoor lighting; No Emissions; No Electronic Interference; No bird airstrike hazards

E: Shielded outdoor lighting; No Emissions; No Electronic Interference; No bird airstrike hazards and Height restrictions

Table 7.2: Summary of Intensity Limitations and Communication Tools by Planning Area

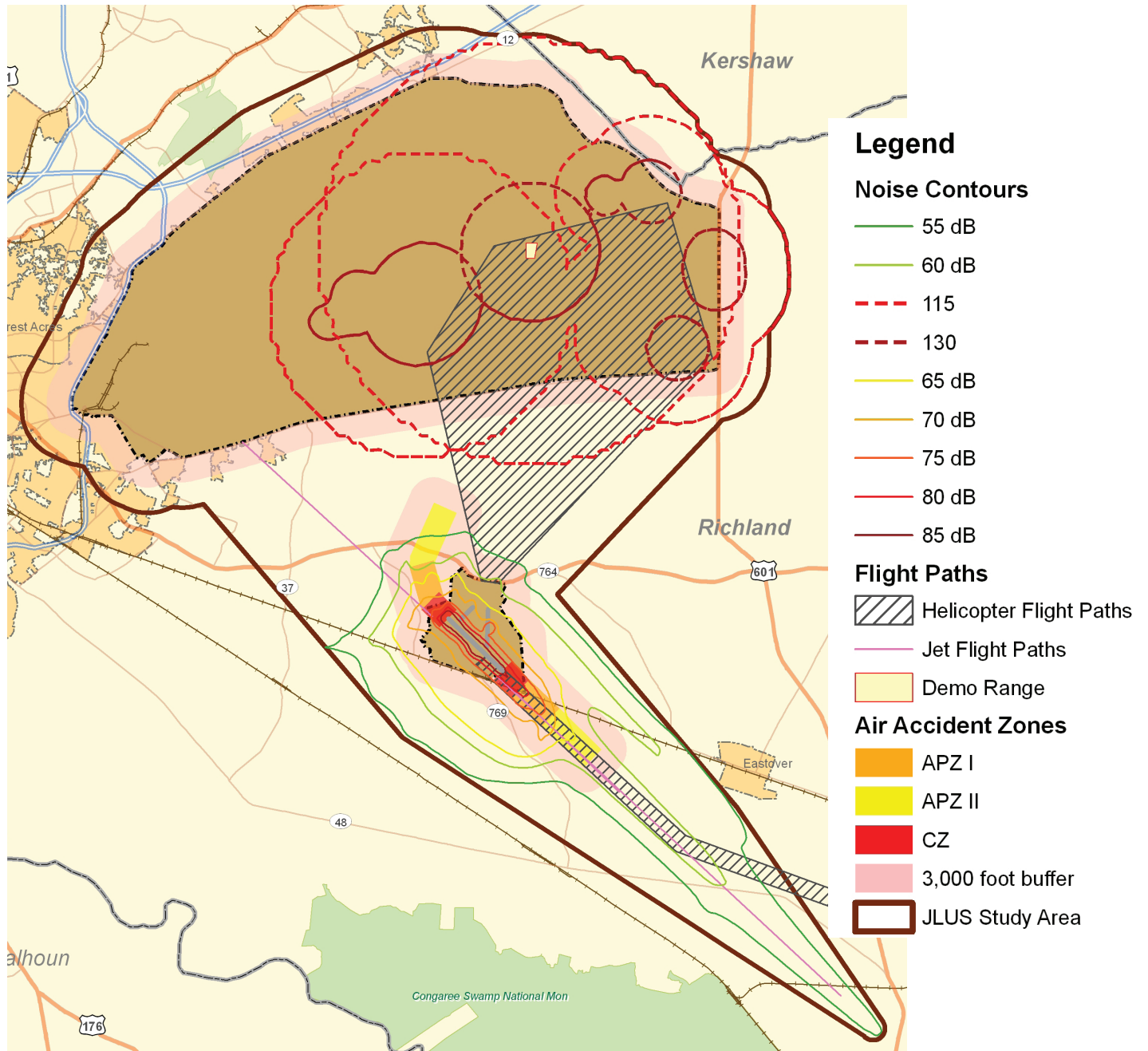


Figure 7.2: Existing 3,000 foot Consultation Buffer

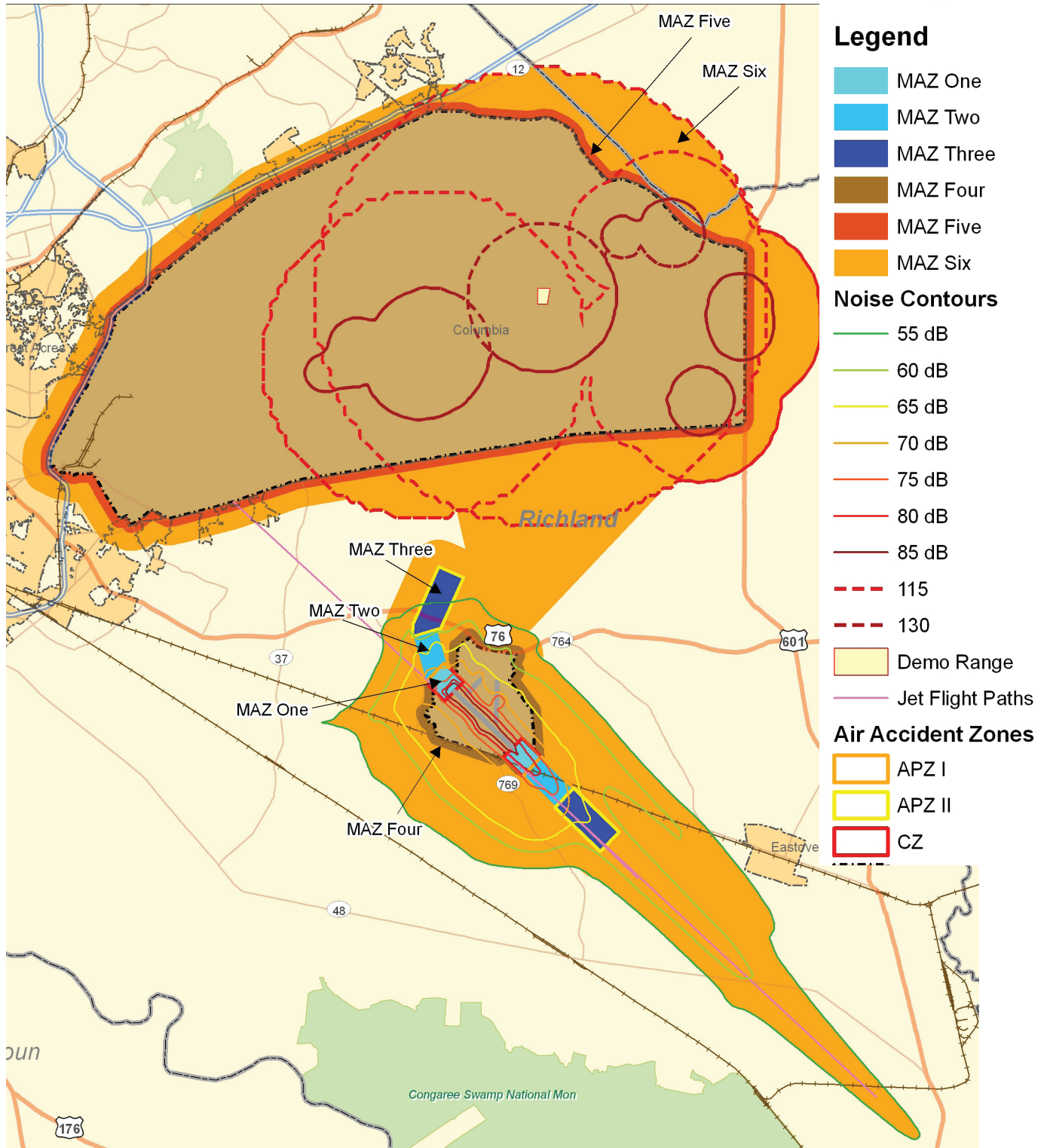


Figure 7.3: Military Activity Zones

7.2 Prioritized Action Steps

The following is a list of recommended measures developed on the basis of the planning team's compatibility findings and feedback from area stakeholders and officials. The near-term actions are feasible strategies intended to address the most pressing land use conflicts around Fort Jackson/McCrary and McEntire JNGB and lay the basic framework for coordinating resource use decisions. The communities and the US Army, South Carolina Army National Guard, and South Carolina Air National Guard should, however, also continue to broaden and refine their array of compatibility planning tools by exploring the longer-term options and strategic efforts that build on these foundational steps.

Near-Term Actions

1. Separate Military Activity Zone District Overlays

While Richland County has an outdoor light code and Airport Height Restrictive Overlay District that controls some of the impacts that can interfere with safe aviation activity, the provisions in the existing codes are not sufficiently detailed in regulating land uses and density in proximity to noise and air safety hazards. The existing overlay district is also intended to minimize aviation hazards near the McEntire airfield and does not address potential land use conflicts associated with noise and low-level flights originating on Fort Jackson/McCrary TC. Similarly, the City of Columbia and Kershaw County lack specific military zoning in proximity to the installation. Though current rural zoning in Kershaw County is compatible with nearby operational impacts, the use of a separate and tailored military zoning overlay allows local government to impose additional standards and provisions that reflect particular encroachment issues. The adoption of a military activity zone overlay district is the single most effective regulatory vehicle for preventing future incompatible growth around the post and base and implementing other recommended consultation and communication procedures.

The Appendix contains a model zoning ordinance appropriate for Richland County since both Fort Jackson/McCrary and McEntire JNGB fall within its boundaries. The ordinance draws from the six Military Activity Zones described in the previous section. The City of Columbia and Kershaw County can modify the ordinance by including

only those Military Activity Zones that are within their jurisdictions.

The most fundamental component of recommended zoning is clarity on the type and intensities of permitted land uses as shown in Table 7.2. The ordinance also includes several critical communication or performance provisions that are described further below, including:

- Real estate disclosure for properties in the broad MAZ 6, which encompasses all noise, air safety and buffer zones around both installations;
- Prohibition of all manufactured home parks in noise zones and air safety zones;
- Sound attenuation for new residential construction (existing housing units and commercial or industrial structures would be exempt from this provision) inside the 55 Ldn or higher around McEntire JNGB or PK 115 dB or higher around Fort Jackson/McCrary TC;
- More detailed language on siting and design practices to reduce the risk of attracting birds and other wildlife to roosting and feeding areas;
- Reference to mandatory consultation with the military for rezoning, major developments or special use permits in the MAZs; and
- Required donation of avigation and/or noise easements for subdivision approval and/or building permits for any structure requiring plan approval.

2. Comprehensive Plan Policy

Both the City of Columbia and Richland County refer to the Joint Land Use Study in their Comprehensive Plans. Columbia's recently adopted 2008 plan includes language on the installation in its Future Land Use, Existing Land Use, Natural Resources and the Priority Investment sections. Richland County has not yet adopted its Comprehensive Plan, but the draft document references the military in the Natural Resources, Economic Development, Priority Investment, and the Land Use Elements.

Clear Comprehensive Plan guidance on collaboration with the military is critical in laying a firm policy framework for specific regulatory tools, such as zoning and sound attenuation. The Appendix contains recommended language that builds on the draft Richland County Comprehensive Plan. The JLUS recommends that comprehensive plan and future land use policy for all jurisdictions in the Military Influence Area include references to:

- Coordination with MAJIC and other conservation land

trusts to implement the Joint Compatible Use Buffer conservation easement program as part of the city or county natural resource strategy;

- Coordination of planned infrastructure expansion to protect the military mission from incompatible development, while achieving the goal of sustainable service delivery;
- Fort Jackson/McCrary TC and McEntire JNGB in the Intergovernmental Coordination section of the Priority Investment Element;
- The military planning areas as identified in the JLUS as part of the future land use mapping process; these planning areas should then become the basis for future land use policy and eventually zoning that is compatible with nearby military operations; (The Columbia Plan, for example, includes a rural buffer around the periphery of Fort Jackson and also identifies a Fort Jackson Buffer Zone and McEntire ANG Station Buffer Zone); and
- Figures on the economic impact of the installations to the region, including growth related to BRAC and other Transformation initiatives in the military.

Though not directly related to compatibility planning around installations, any quality or smart growth policies that encourage urban infill, the revitalization of mature neighborhoods, contiguous areas of growth, and open space preservation are strong complements to military-based zoning districts because they curb the spread of development into the rural areas.

3. JLUS Partnership Organization

It is critical during the implementation phase to have an organization that conducts ongoing advocacy for coordinated land use planning and monitors growth trends and mission-related issues to identify emerging encroachment threats. The JLUS recommends establishing a JLUS Partnership that consists of representatives from each local government, Fort Jackson/McCrary, McEntire JNGB, MAJIC, the Greater Columbia Chamber of Commerce Military Affairs Committee, CMCOG, and other state stakeholders, such as BRAC coordinators. The Partnership would meet on an annual or bi-annual basis to review any changes in mission, facilities, or troop strength at the post and base, discuss significant regional developments, identify encroachment reduction actions taken, and share data and the results of monitoring activities.

Multi-jurisdictional and multi-sector collaborations are more effective when led by a single entity. The JLUS

recommends that CMCOG spearhead organization efforts for the Partnership and provide technical assistance and staffing to coordinate meetings. The Partnership could, for example, become a CMCOG committee or a sub-committee under the existing Regional Planning & Development Advisory Committee.

Two of the best examples of regional JLUS frameworks are the Fort Campbell JLUS Partnership in Kentucky and Tennessee and the Fort Bragg/Pope Air Force Base Regional Land Use Advisory Commission in North Carolina. The Fort Campbell Partnership meets on an annual basis. The installation's community planner prepares a yearly briefing for all participants that includes statistics on mission change and realignment, expenditures, transportation, infrastructure and facility improvements, and growth near the installation.

One of the most sophisticated of ongoing regional JLUS frameworks, the Fort Bragg/Pope Air Force Base Regional Land Use Advisory Commission (RLUAC) first organized in 1991 and incorporated in 2004. RLUAC holds quarterly meetings and has conducted detailed encroachment studies of issues such as telecommunications towers and light pollution. Members also have reviewed over 130 rezoning cases, subdivision proposals, and proposed telecom tower locations. All findings are non-binding and intended to be of technical assistance to local communities and the military when making decisions on resource and land use. The RLUAC consists of approximately 60 members, including local elected officials, city and county administrators, planners, environmental and GIS specialists, and military personnel. The organization has a part-time Executive Director and raises funding from the member governments and the State of North Carolina. The Appendix contains the organization's by-laws as adopted by both local communities and the military.

When establishing the initial organizational framework for a JLUS Partnership, the CMCOG in collaboration with partner governments and military stakeholders should focus on several key steps, including:

- Identifying Partnership members, which will likely reflect a mix of current Policy and Technical Committee participants;
- Establishing issues to review and information to share, including monitoring mechanisms such as the tracking of all building permit and subdivision data within the Military Influence Area around the installations; and
- Developing a list of longer-term implementation

measures that could be funded by the Office of Economic Adjustment as part of a second phase of the JLUS; one of the most useful data-sharing projects is to build an interactive, web-based GIS application that allows select stakeholders to access a standardized set of zoning, existing land use, future land use, utility, environmental resource, conservation and planning boundary layers. CMCOG could, for example, host and update data in conjunction with the local governments and MAJIC to ensure that all members have access to this useful decision-support tool.

While the formality of incorporation and the adoption of by-laws may be unnecessary, particularly during the early stages of formation, stakeholders can include provisions for ongoing meetings and exchanges of information as part of a signed Memoranda of Understanding. (See Appendix).

4. Enhanced Legal Notification/ Real Estate Disclosure

As described earlier, the recommended zoning overlay district includes enhanced provisions for notifying prospective home buyers and renters of a property's proximity to noise, air safety risks, low-level military overflights, and related operational impacts. The JLUS recommends use of a Real Estate Disclosure form for all properties inside the Military Influence Area or MAZ 6. The form can be affixed to all listing agreements and sales and rental contracts, as well as the State of South Carolina Residential Property Condition Disclosure Statement. The state currently requires an owner of residential real estate (single-family homes and buildings with up to four dwelling units) to provide a purchaser with a completed property condition disclosure statement prior to signing a contract of sale.

The Appendix contains a sample Real Estate Disclosure Form. Local and regional stakeholders could also lobby the State of South Carolina to include proximity to a military installation as a condition requiring disclosure on the form. The successful use of real estate disclosure requires cooperation from local realtors and builders. The JLUS recommends conducting outreach to the real estate and development industry to build support for implementation.

In addition to disclosure during private real estate transactions, the cities and counties should clearly mark "Military Influence Area" on subdivision plats and property deeds, thus triggering notice during a title search.

5. Enhanced Community Information

Better information on the interaction between community and military growth will flow naturally from efforts to establish an ongoing Partnership and to require real estate disclosure and expanded consultation. The JLUS, however, also recommends that stakeholders take steps to facilitate less formal communication within the community, including:

- Hosting a long-term link on city, county, CMCOG and Fort Jackson and McEntire web sites to the JLUS document and maps; and
- Publishing and disseminating a brochure or poster that includes key maps, discusses the regional economic impact generated by the installations, identifies military operational issues and summarizes key JLUS findings and potential development standards for property owners; any materials circulated through the community should also clearly identify a point of contact for each local government, as well as Fort Jackson, McCrady TC, and McEntire JNGB.

6. Residential Sound Attenuation

As indicated in the model zoning overlay, the JLUS recommends requiring sound attenuation construction practices for new residential construction in the 55 Ldn or higher noise contours of McEntire JNGB and the PK 115 dB or higher noise contours of Fort Jackson/McCrady TC. Noise attenuation generally tends to be more effective in minimizing the high frequency sound associated with aircraft and vehicle movement, rather than the impulsive lower frequencies generated by large weapons firing. Attenuation efforts should, therefore, prioritize implementation in the McEntire noise contours.

Given the relative inability to insulate manufactured housing from noise exposure, the model zoning also suggests a prohibition on manufactured home parks in high noise areas. The prohibition as currently proposed would not limit individual manufactured units placed on property. Compliance and enforcement can also create an administrative challenge in implementing noise mitigation. Effective noise abatement provisions will typically require that an acoustical engineering submit evidence of compliance through an acoustical analysis report to be included along with the application for a building permit.

South Carolina has adopted the building, residential, gas, plumbing, mechanical, fire, and energy codes as published by the International Code Council, Inc (Council). Local communities currently use the 2006 International Building Code (IBC) and the 2003 International Residential Code

(IRC). Local jurisdictions cannot develop their own codes, regardless of whether they are more or less restrictive. However, the Council may modify or amend the Codes by request of a local jurisdiction or professional association after a finding that the modifications provide a reasonable degree of public health, safety, and welfare.

Regional and local stakeholders could lobby the Council to include military noise exposure as a condition that warrants possible Code revision. Stakeholders can also participate in the ongoing comment period to revise the 2009 code, which began on June 1, 2009. Comments will be accepted until December 1, 2009. The planned date of implementation for the 2009 Code is July 1, 2011.

The Appendix contains an amendment to the International Code Council's 2003 International Building Code to require sound attenuation for new housing units. The amendment language could be used as the basis for input during the Council's comment period. The Appendix also includes a summary of general construction requirements to achieve specific noise level reductions and the Sound Transmission Class (STC) of various building construction elements. These practices reflect findings from a study prepared by Wyle Research and Consulting for Wright-Patterson Air Force Base.

Similar to real estate disclosure, the use of sound attenuation construction practices will require the cooperation of private sector interests. The JLUS recommends conducting outreach to the development industry to raise awareness of the value of sound attenuation and the secondary benefits related to energy efficiency. Local communities could also provide incentives, such as reduced application review fees for developers meeting more stringent noise reduction standards.

7. Aircraft-Wildlife Strikes Mitigation Standards

The model zoning overlay contains several specific provisions to reduce the likelihood of attracting wildlife, particularly birds into active air spaces. Local communities should use these siting and design standards as a routine part of site plan review for properties inside the approach and departure zones around McEntire JNGB and inside the Military Influence Area. The Appendix contains an example of a Memorandum of Agreement among federal agencies to take steps reducing strike potential. Specific standards that can be incorporated into land development codes at the local level include:

- Human-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 should be sited at least 10,000 feet from any runways, loading ramps, or aircraft parking areas used or planned to be used by turbojet or turboprop aircraft;
- Human-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 should be sited at least 5 miles from any runways, loading ramps, or aircraft parking areas if the use places the runways and/or approach and departure patterns of the airfield between bird feeding, water or roosting areas; and
- Stormwater facilities should be designed to use steep-sided, narrow, linearly-shaped, rip-rap lined, water detention basins rather than retention basins. When possible, ponds should be placed away from aircraft movement areas to minimize aircraft-wildlife interactions. All vegetation in or around detention or retention basins that provide food or cover for hazardous wildlife should be eliminated.

The FAA also offers specific guidance on safe wetlands mitigation near airports:

- FAA recommends that wetland mitigation projects that may attract hazardous wildlife be sited outside of the separations identified above. Wetland mitigation banks meeting these siting criteria offer an ecologically sound approach to mitigation in these situations.
- Exceptions to locating mitigation activities outside the separations identified in the siting criteria may be considered if the affected wetlands provide unique ecological functions, such as critical habitat for threatened or endangered species or ground water recharge. Such mitigation must be compatible with safe airport operations. Enhancing such mitigation areas to attract hazardous wildlife should be avoided. On-site mitigation plans may be reviewed by the FAA to determine compatibility with safe airport operations.
- Wetland mitigation projects that are needed to protect unique wetland functions and that must be located in the siting criteria should be identified and evaluated by a wildlife damage management biologist before implementing the mitigation. A wildlife damage management plan should be developed to reduce the wildlife hazards.

8. Gate Access and Transportation Planning

Stakeholders and members of the public consistently raised the issue of vehicular congestion of the local road network resulting from heavy visitation to Fort Jackson on Graduation Days. In 2008, Fort Jackson conducted the Hilton Field Area Development Plan, which among other issues examined the access route through Gate 4 to the parade field.

The plan proposes moving Gate 4 farther into the installation, effectively adding queue space on the post. An enhanced gate area could accommodate six inspection lanes, along with two truck lanes, thus accelerating the inspection process. Overall, these access improvements would cost approximately \$3 million. The JLUS recommends that the Army and Fort Jackson planners continue to support implementation of the recommended access improvements. The local governments and the CMCOG should also explore opportunities to enhance post access, including:

- Providing another alternative to get to Fort Jackson Gate 2 by improving access from I-20. Improve Exit 76 A and 76 B off of I-20 to a half clover-leaf design, facilitating southbound flow onto Alpine Drive. Realign the Alpine Drive and Percival Road intersection to make the southwest movement the primary direction; Also realign the Old Percival Road and Percival Road intersection to make Percival Road the primary movement and add signage directing all I-20 traffic to Exit 76 instead of I-77 Exit 15;
- Realigning Percival Road and Boyden Arbor Road to make the southbound traffic the primary movement. This will require purchasing single-family homes for the new road alignment. Alternatively, the community can provide traffic control measures on graduation days to restrict all movements except those entering the post; or
- Running a military-owned shuttle to a remote parking location on graduation days and prohibiting graduation traffic on the post.

Broader transportation studies and initiatives should also stress efforts to coordinate with military needs and operations. The Sumter/Columbia Transit Feasibility Study, for example, will focus on transit alternatives along Highway 378/76. Since transit feasibility necessarily requires increased residential and employment density to generate ridership, the study should carefully examine the interaction of any proposed transit nodes and associated pockets development on noise and accident potential zones.

Land use and operational impact issues should also be

coordinated as part of the Light Rail Study between the cities of Columbia and Camden. Highway 378/76 will continue to emerge as a key transportation corridor for the region. The corridor is part of the Strategic Highway Network system that supports defense readiness capabilities, such as troop mobilization and vehicle convoys. The Highways for National Defense program works with military installations and state departments of transportation to determine public highway infrastructure needs related to the military mission, public safety, and local economic development.

The Defense Access Road Program also contributes federal funding for public highway improvements necessitated by sudden defense-generated impacts. Ongoing CMCOG and state transportation efforts should continue to identify the Department of Defense as a potential partner when planning for improvements on stretches of Highway 378/76 or adjacent interstates near the installations. Also, the 378/76 corridor could be the basis for a broader regional effort to coordinate with Shaw AFB and Pointsett Range and market regional economic assets.

9. Corridor and Neighborhood Plans

Area corridors are particularly vulnerable to strip commercial development. Proactive corridor planning allows stakeholders to develop a long-term vision for the roadway and identify land use policies that cluster development at key intersections and protect open space along the corridor. The JLUS recommends corridor studies for Percival Road from I-77 to Screaming Eagle Road and Leesburg Road from Fairmont Drive to McCord's Ferry Road. The intent of these studies is to solidify the development character along the northern and southern peripheries of the installation and establish land uses that do not conflict with adjacent military operations. The study scopes should include:

- Community and stakeholder involvement;
- Coordination with land uses compatibility guidelines for the installation security buffers as described above;
- Traffic analysis;
- Landscaping/wayfinding/open space buffers;
- Access management; and
- Infrastructure and mobility improvements.

The JLUS also recommends development of a neighborhood plan for the large-scale residential project

proposed near in the vicinity of Lower Richland High School west of McEntire JNGB. Similar in scope to the Southeast Richland Neighborhood Master Plan around the intersection of Lower Richland Boulevard and Garners Ferry Road, this study should envision a mix of land uses and open space elements that minimizes encroachment around the airfield and directs the densest development to the west.

10. Intergovernmental Coordination and Planned Growth Areas

The biggest future threat of encroachment comes from the continuing eastward shift of Columbia's suburban development, particularly in areas north of Fort Jackson/ MTC and just west of McEntire JNGB. The city's water and sewer service areas typically drive annexation policy and the resulting patterns of growth. The existing process has created scattered pockets of urban development along the northern and southern peripheries of the installation. Since Fort Jackson is also part of the incorporated limits, the city can more readily extend services and annex land in rural parts of Richland County, thus generating the potential for more leap-frogging growth.

To address this risk of a creeping and blurred urban/rural boundary, the JLUS recommends that the City of Columbia and Richland County engage in a coordinated process of planning future growth areas. South Carolina state law enables the use of extraterritorial jurisdictional planning to delineate the boundary between urban and rural areas. As part of this effort, the city and county should execute a joint-service growth boundary agreement that identifies a phased, contiguous and orderly trajectory for suburban development and associated utilities.

Accommodating future development and public investments within an explicitly planned growth boundary supports several complementary goals, including directing development pressure back toward mature communities, promoting more efficient delivery of infrastructure, protecting the rural character and environmental resources of Richland County, and guiding growth away from impact areas near the installations.

The areas around Fort Jackson and McEntire, for example, 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. The Appendix contains an example of a city/county

Growth Management Agreement.

The Columbia City Council is currently exploring an Annexation Urban Service Area that would identify Primary and Secondary boundaries, as well as designated "donut holes" that will not receive municipal level services.

Long-Term Actions

1. Conservation Partnering and "Stacking"

The region already has a strong platform from which to implement one of the most innovative and effective of tools for reducing encroachment -The Midlands Area Joint Installation Consortium or MAJIC. MAJIC has continued its outreach to willing area landowners in an effort to purchase conservation easements as part of the Department of Defense's Joint Compatible Use Buffer initiative. The consortium focuses on properties between Fort Jackson and McEntire JNGB, areas south and southeast of McEntire JNGB, properties south and southwest of Poinsett, and areas south of Shaw AFB.

The Central Midlands Council of Governments and local jurisdictions can enhance the efforts of MAJIC in several critical ways:

- Align land use, natural resource, recreational, and infrastructure policies with JCUB priority areas. CMCOG and the cities and counties should collaborate with MAJIC to link their land use, open space planning, and infrastructure efforts to a generalized map of priority areas identified through the MAJIC ranking process. CMCOG, for example, has incorporated open spaces associated with Fort Jackson, McEntire JNGB, and the area between the installation and the Wateree River and the Sumter Highway Scenic Corridor as part of its concept document on green infrastructure. JCUB priority areas should be a key input in developing more specific county-wide open space, parks, scenic corridor and trails maps. The City of Columbia, Richland County and Kershaw County should also ensure that their existing land use and infrastructure policies do not conflict with conservation easement plans. Local regulatory and infrastructure policy should work in concert to guide the densest forms of development away from lands with an overlap of operational impacts and conservation value, thus easing development pressure and avoiding an unintended contribution to escalating land prices.

The cities and counties should also ensure that conservation subdivision designs, rural clustering, wetland and stream mitigation and other low impact development practices are consistent in reinforcing the JCUB's

geographic priorities.

- **Stack eco-system credits.** The concept of stacking recognizes the often overlapping benefits that result from sound eco-system management on a single piece of land e.g., air and water quality, soil restoration/conservation, and wildlife habitat. The intent is to create a market in which individuals can trade credits and thus receive multiple payments for inter-related ecological outcomes such as clean water, greenhouse gas reductions, or wetland preservation. Conservation thus becomes more economically competitive relative to alternative land uses.

The CMCOG, for example, participates in a wetlands mitigation banking system that allows landowners to restore degraded wetlands and stream banks and then sell development credits representing the value of the enhanced area to those individuals who may be adversely affecting wetlands in other parts of the same ecoregion. The landowner receiving credit payments must maintain an easement on the restored wetlands and stream areas. The CMCOG and MAJIC along with local governments should explore ways to combine wetlands mitigation and encroachment reduction efforts, creating a dual stream of income for the landowners and increasing the incentive for program participation. Other conservation efforts that could be rolled into an integrated trading system include the restoration of long-leaf pine forests and wildlife habitat for threatened and endangered species, such as the red-cockaded woodpecker. The CMCOG and MAJIC can also seek ways to leverage their conservation initiatives by siting future wetlands banking areas on high priority JCUB lands when feasible (wetlands can, however, pose a risk of attracting birds and other wildlife if too close to approach and departure areas around the airfield) and conducting joint outreach to property owners.

- **Expand Conservation Partners.** The CMCOG and cities and counties are already active participants in the MAJIC initiative. Regional stakeholders should continue to reach out to state and even inter-state partnerships to identify complementary conservation strategies. The South Carolina Conservation Bank, for example, seeks to protect significant natural resource areas and wildlife habitats, protect water quality, farmlands, significant historical and archaeological sites, and enhance public access for outdoor recreation. The Bank is authorized to award grants to eligible trust fund recipients for the purchase of interests of land either through fee simple acquisition or easements.

The State of Florida has used a similar land acquisition program, Forever Florida, to purchase land surrounding

military installations. Regional and local representatives should lobby the State of South Carolina and the Conservation Bank to recognize the protection of military installations as a significant secondary benefit of environmental preservation and to include encroachment reduction as an explicit criteria in evaluating applications for Bank grants.

The State of South Carolina is also a member of the Southeast Regional Partnership for Planning and Sustainability (SERPPAS), which works to prevent encroachment around military installations, encourage compatible resource-use planning, and improve coordination among regions, states, local governments, and the military. MAJIC and other Central Midlands stakeholders should continue to play an active role in this innovative multi-state project and participate in joint efforts, such as the Strategic Lands Inventory, which develops regional land suitability models.

- **Establish a One-Stop Shop for Environmental Initiatives.** Regional entities, such as CMCOG, MAJIC, and local land trusts should create a single clearinghouse of mapping data, resource inventories, regulatory policies, and available conservation incentives. A readily identifiable and accessible source of information for the Central Midlands would assist property owners in assessing potential conservation opportunities on their properties and in making resource use decisions that reinforce local and state environmental goals.

2. Strategic Transportation Improvements

While gate access to Fort Jackson emerged as the most pressing of transportation issues, stakeholders also identified other improvements to enhance mobility through and around the installation. At more than 13 miles in length along its southern perimeter, the post acts as a major barrier to north-south access in the region.

Stakeholders have identified the public opening of Wildcat Road, which travels through the installation as an opportunity to improve access. Precedent does exist for the public use of roadways through military installations, including Highway 119 in Fort Stewart. Allowing public vehicles on Wildcat Road would require the installation of security fencing and gates along the corridor and additional funding to staff gates with security personnel and to provide for county maintenance of the roadway. The total cost to design, construct, staff and maintain the roadway is estimated at \$20 million. Options may include restricting access on the corridor to military and contractor vehicles.

The re-opening of Wildcat Road remains a priority for the Lower Richland community and its representatives are examining project cost and possible financing sources. Military and community stakeholders should continue to explore safe, cost-effective, and feasible options for increasing access to the roadway, including possible bicycle access.

The widening of Leesburg Road from Fairmont and McCord's Ferry as identified in the COATS 2035 Long Range Transportation Plan could also play a major role in shaping land use and mobility decisions in southern Richland County. Widening the corridor would require the removal of some existing homes and would require further discussions with Fort Jackson concerning the potential for the acquisition of right-of-way on installation property. The South Carolina Department of Transportation is beginning the initial design study for a portion of the widening project. Military and community stakeholders should strongly promote a coordinated approach to land use and transportation planning along this sensitive corridor as part of any early study phase.

3. Sustainability Partnerships

While the JLUS is focused primarily on reducing the risk of encroachment to the military mission and protecting public safety, stakeholders should also remain focused on using the collaborative planning mechanisms developed in this process to promote quality of life throughout the Central Midlands. Emerging sustainability partnerships in defense communities not only protect the long-term viability of the military mission, but also focus on strategies to improve public infrastructure capacity, increase joint service delivery, protect the environment, and promote economic activity.

Fort Jackson has a very active and successful Sustainability Management System (SMS) that seeks sustainable, long-term economic development in the Fort Jackson region. The SMS could be combined with local government, regional, and non-profit efforts to build collaboration in the following areas:

- Evaluating the recreational use of Fort Jackson's lands to increase recreational access for the region's residents;
- Initiating an outreach/education/awareness program that explores sustainability strategies;
- Creating pilot programs to demonstrate sustainable practices and participating in a joint web site that contains links to sustainability resources;

- Exploring reduction, reuse, recycling, and composting methods to lower the quantity of solid waste;
- Jointly pursuing watershed protection strategies, such as wetlands banking, low impact site development techniques, maintenance of natural vegetative buffers, and stream restoration to ensure surface and ground water quality;
- Sharing regional GIS data on land uses, environmental features, and infrastructure;
- Establishing a pilot project to demonstrate alternative energy sources;
- Requiring new publicly funded community facilities to incorporate green building and site design standards;
- Encouraging the construction of more sustainable systems that use less energy and water;
- Participating in a Sustainable Transportation Plan process that includes community partners and CMOG and focuses on long-term performance in areas such as renewable energy, reducing hazardous air emissions, and promoting alternative transportation options;
- Adopting procurement practices that support sustainability, such as environmentally preferable cleaning products;
- Developing a series of sustainability indicators to monitor quality of life in the region; and
- Publishing an annual Sustainability Report that highlights joint military/community initiatives and success stories.

One of the best national examples of a broad regional sustainability partnership is the Sustainable Sandhills, a nonprofit organization focused on the eight county region surrounding Fort Bragg. Sustainable Sandhills includes programs in awareness and education, air quality, green business, green living and design, regional planning, recycling, and local food and culture.

4. Regional Coordination with Shaw AFB/ Defense Corridor

The Shaw AFB JLUS continues to be on hold due to the pending Joint Strike Fighter decision. However, once planning activity resumes, stakeholders should collaborate with the City and County of Sumter on issues of mutual interest such as transportation and growth along Highway 378/76. The communities should also coordinate more broadly on economic development and tourism strategies. For example, the region around Fort Bragg in North Carolina has formed the All-American Defense Corridor, which includes Fort Bragg, Pope AFB, and Camp Mackall.

The program's purpose is to attract defense companies, create partnerships and alliances between industry, universities and DoD programs and identify regional assets, such as skilled workers, educational institutions, infrastructure, and quality of life. Local and regional stakeholders should explore ways to articulate a similar vision among the five military installations of the Central Midlands.



Main Street, Columbia, SC