

FORT STEWART JOINT LAND USE STUDY

Prepared by EDAW under contract to the
Coastal Georgia Regional Development Center

September 2005



JOINT LAND USE STUDY

This study was prepared under contract with the Coastal Georgia Regional Development Center with financial support from the Office of Economic Adjustment, Department of Defense. The content reflects the views of the participating entities and does not necessarily reflect the views of the Office of Economic Adjustment.

The Fort Stewart/Hunter Army Airfield Joint Land Use Study (JLUS) is a cooperative land use planning initiative between the U.S. Army and surrounding cities and counties of the region.

Partners in the JLUS study include: Bryan, Effingham, Chatham, Liberty, Long, and Evans Counties; the Cities of Hinesville, Savannah, Pooler, Bloomingdale, Pembroke, Richmond Hill, Glennville, Gum Branch, Allenhurst, Flemington, and Walthourville; the Coastal Georgia Regional Development Center and the Heart of Georgia-Altamaha Regional Development Center; and Fort Stewart/Hunter Army Airfield.

This document serves as an ongoing guide to local government and Army actions to enhance compatibility around Fort Stewart/Hunter Army Airfield and strengthen the civilian-military relationship.



Policy Committee:

Chair of the Policy Committee: Tom Ratcliffe, Mayor, City of Hinesville

Colonel John M. Kidd, Garrison Commander, Fort Stewart/Hunter Army Airfield

John Parrish, Chairman, Bulloch County Commission

Brooks Warnell, Chairman, Bryan County Commission

Pete Liakakis, Chairman, Chatham County Commission

Gregg Howze, Chairman, Effingham County Commission

John D. McIver, Chairman, Liberty County Commission

Randall Wilson, Chairman, Long County Commission

Roger Moore, Chairman, Evans County Commission

John Parker, Chairman, Tattnall County Commission

Otis Johnson, Mayor, City of Savannah

Mike Lamb, Mayor, City of Pooler

Ben A. Rozier, Mayor, City of Bloomingdale

Judy Cook, Mayor, City of Pembroke

Barbara Nelson Lanier, City of Pembroke

Richard Davis, Mayor, City of Richmond Hill

Jean Bridges, Mayor, City of Glennville

Eddie Simpson, Mayor, City of Gum Branch

Thomas Hines, Mayor, City of Allenhurst

Sandra Martin, Mayor, City of Flemington

Henry Frasier, Mayor, City of Walthourville

Luciria Lovette, Council, City of Walthourville



Technical Committee:

Teresa Scott , District V, Georgia Department of Transportation
Phil Jones, Administrator, Bryan County
Christy Stringer, Planner, Bryan County
Russ Abolt, Administrator, Chatham County
David Rutherford, Administrator, Effingham County
Joey Brown, Administrator, Liberty County
Beverly Johnson, Long County
Caughey Hearn, Administrator, Evans County
Betty Hall, Manager, Tattnall County
Michael Brown, Manager, City of Savannah
Billy Edwards, Administrator, City of Hinesville
Dennis Baxter, Administrator, City of Pooler
Sandra Jones, City Clerk, City of Bloomingdale
John Butler, Zoning Administrator, Bryan County
Mike Melton, Administrator, City of Richmond Hill
Steve Scholar, Planning, City of Richmond Hill
Teresa Pazderski, City Clerk, City of Glennville
Evelyn Strickland, City Clerk, City of Gum Branch
Terri Willet, City Clerk, City of Flemington
Beth Willis-Stevenson, Environmental Specialist-Noise Program and NEPA
James Pearson, Range Control
Tim Beaty, Chief, T&E Species Management Section, Environmental and Natural Resources Division, Directorate of Public Works
Laura Putnam, Planning, Master Planning Division, Directorate of Public Works
Frank Barton, Project Manager, Office of Economic Adjustment
Rafael Nail, Altamaha Regional Development Center
Allen Mazza, Exec Director, Altamaha Regional Development Center
Russ Marane, Coastal Program, Trust for Public Land
Frank McIntosh, Georgia Land Trust
Courtland Hyser, Planner, Chatham-Savannah Metropolitan Planning Commission
Tom Wilson, Chatham-Savannah Metropolitan Planning Commission
Sonny Timmerman, Director, Hinesville-Liberty County Metropolitan Planning Organization
Paul Smith, Planning Director, Coastal Georgia Regional Development Center



Table of Contents

1. Study Purpose	1
2. Organization	4
3. Background Information	7
4. Technical Information	18
5. Compatibility Tools	30
6. Implementation Plan	45

Technical Appendix

- Acronyms
- Glossary
- DoD Compatible Land Use Guidelines for Clear Zones and Accident Potential Zones
- Guidelines for Considering Noise in Land Use Planning And Control
- Sample Real Estate Disclosures
- Sample Memorandum of Understanding
- Georgia Land Conservation Program Request

List of Tables

Table 1. Distribution of Land by County	1
Table 2. JLUS Committee Structure	5
Table 3. Committee Meeting Dates	5
Table 4. Regional Growth Trends	15
Table 5. Noise Compatibility Guidelines	24
Table 6. Air Safety Compatibility Guidelines	24
Table 7. Fort Stewart Areas of Concern	42
Table 8. HAAF West Areas of Concern	43
Table 9. HAAF East Areas of Concern	44



List of Figures

- Figure 1. Regional Context
- Figure 2. Regional Environmental Resources
- Figure 3. Small Arms Noise Contours
- Figure 4. Existing Large Arms Noise Contours
- Figure 5. Proposed DMPRC Noise Contours
- Figure 6. Air Safety and Noise Zones, WAAF
- Figure 7. Air Safety and Noise Zones, HAAF
- Figure 8. Existing Land Use, Pembroke
- Figure 9. Existing Land Use, Hinesville
- Figure 10. Existing Land Use, East HAAF
- Figure 11. Existing Land Use, West HAAF
- Figure 12. Future Land Use, Pembroke
- Figure 13. Growth Trends, Pembroke
- Figure 14. Future Land Use, West HAAF
- Figure 15. Growth Trends, HAAF
- Figure 16. Future Land Use, Hinesville
- Figure 17. Growth Trends, Hinesville
- Figure 18. Zoning, Pembroke
- Figure 19. Zoning, Hinesville
- Figure 20. Zoning, East HAAF
- Figure 21. Zoning, West HAAF
- Figure 22. 3,000-Foot Buffer
- Figure 23. Army Compatible Use Buffer
- Figure 24. Air Safety and Noise Zones
- Figure 25. Areas of Concern, Fort Stewart
- Figure 26. Areas of Concern, HAAF



1.1 Introduction

The Fort Stewart/Hunter Army Airfield Military Complex in southeast Georgia consists of maneuver/range, cantonment and impact areas, supported by an aviation power platform. The post is a relatively flat, coastal landscape of sandy soils, riparian areas, and marshland that falls in portions of six counties—Bryan, Chatham, Evans, Liberty, Long, and Tattnall. The City of Hinesville and Liberty County are adjacent to the cantonment area along the southern boundary of the post. The City of Pembroke and Bryan County surround Fort Stewart to the north. The Cities of Glennville and Richmond Hill lie to the west and east of post boundaries, respectively. Hunter Army Airfield (HAAF) is approximately 40 miles east of Hinesville in the City of Savannah and Chatham County, Georgia.

The Army first activated Camp Stewart, an anti-aircraft artillery training center in 1941, adjacent to the 500 residents of the City of Hinesville. Originally a 5,000-acre facility, the installation acquired substantially more land in subsequent years to accommodate the training needs of an entire brigade combat team. The Army acquired the 54,000-acre HAAF from the U.S. Air Force in 1967. Today, the Fort Stewart/HAAF complex is a major land use presence in the region. Table 1 shows the distribution of the post's 280,000 acres among the six counties.

Table 1. Distribution of Installation Land by County

County	Acres of Stewart/Hunter Complex from the County	Percentage of Stewart/Hunter Complex from the County
Bryan	108,780	38.2
Chatham	5,653	2.0
Evans	17,290	6.1
Liberty	118,256	41.5
Long	28,282	9.9
Tattnall	6,662	2.3
TOTAL	284,923	100.0

Over the years, the cities and counties around Fort Stewart and HAAF have grown along with the military, reinforcing the close relationship between the complex and



the nearby communities. This interdependence, however, raises the challenge that is central to the Joint Land Use Study effort.

As military installations expand, they bring new people and economic activity to an area. The communities then build houses, schools and infrastructure, and create new jobs to support soldiers, installation workers, and their families. More people begin to live and work in proximity to the noise and safety risks generated by military installations. The presence of civilian uses can in turn place pressure on installations to modify their operations, possibly compromising the overall military mission.

The Department of Defense (DoD) has two major programs designed to address potential conflicts between military and civilian land uses. In 1983, the Army established the Installation Compatible Use Zone (ICUZ) program to identify noise-affected areas around installations and to develop cooperative approaches for reducing adverse impacts. The ICUZ program has since become the Army's Installation Environmental Noise Management Plan (IENMP).

In 1985, the DoD initiated the Joint Land Use Study (JLUS) program to create a participatory, community-based framework for land use planning around military installations.

The objectives of the JLUS are two-fold:

1. to encourage cooperative land use planning between military installations and the surrounding community; and
2. to seek ways to reduce the operational impacts of military installations on adjacent land.

The JLUS process encourages residents, local decision-makers, and installation representatives to study issues of compatibility in an open forum, balancing both military and civilian interests.

Civilian and military stakeholders joined in initiating this effort for the region around Fort Stewart and HAAF as part of DoD's nationwide JLUS program. The Office of Economic Adjustment (OEA) within DoD funded three-quarters of the study, while



participating jurisdictions supplemented the initiative with local and regional resources.

1.2 Study Goals

The Fort Stewart/HAAF JLUS is the outcome of the public, private and military sectors acting together to achieve the following overall goals:

- increase communication between the military and the communities;
- evaluate the potential impacts of current and future military operations on surrounding cities and counties; and
- evaluate the potential impacts of community growth on the long-term viability of Fort Stewart's and Hunter's mission.

The ultimate goal is to reduce potential land use conflicts, accommodate growth and sustain the regional economy.



2.1 Planning Area

The JLUS focuses on the Fort Stewart and Hunter Army Airfield (HAAF) military complex and the surrounding communities of the region. Affected local jurisdictions include members of the Coastal Georgia Regional Development Center (Region 12) and the Altamaha-Heart of Georgia Regional Development Center (Region 9).

Given the number of stakeholders and governmental entities, the JLUS team identified two tiers of participants: those communities, such as the Cities of Hinesville, Pembroke, Savannah and Richmond Hill and the Counties of Bryan, Liberty, and Chatham that are directly adjacent to Fort Stewart/HAAF facilities; and other jurisdictions that are within the regional influence of the military installation.

The JLUS boundary, therefore, includes a broad area of approximately five miles around the post and airfield to ensure that the study team analyzed compatibility issues on all lands that could either affect or be affected by military activities (see Figure 1).

2.2 Participating Stakeholders

One of the most critical goals of the JLUS process is to create a community-based plan that builds consensus from varied interests, including residents and property owners, local elected officials, businesses, and military representatives.

The following organizational committees participated throughout plan development to ensure that the JLUS document incorporates a cross-section of opinions and reflects feasible, practical solutions.

The Policy Committee

The Policy Committee consisted of local elected officials from each participating jurisdiction, along with leadership from Fort Stewart and Hunter Army Airfield and senior representatives from stakeholder organizations.

The Policy Committee was responsible for the overall direction of the JLUS, approval of the budget, preparation of the study design, review of draft and final written reports, consideration of policy recommendations, and monitoring the implementation of any adopted policies.



The Technical Committee consisted of area planners, city and county managers and professional staff, military planners, and representatives from natural resource protection organizations. This committee was responsible for data collection, identifying and studying technical issues, and developing recommendations for further consideration by the Policy Committee.

Table 2 shows the general roles and responsibilities of the committees, as recommended by the DoD Program Guidance Manual.

Table 2. JLUS Committee Structure

Committee	Members	Responsibilities
Policy Committee	City Officials County Officials Post Leadership	Policy Direction Study Oversight Budget Approval Monitoring Report Adoption
Technical Committee	Post Planners City Staff County Staff	Technical Issues Tool Evaluation Report Development

The Policy and Technical Committees met on a regular basis throughout the JLUS planning process as shown in Table 3.

Table 3. Committee Meeting Dates

Policy Committee	Technical Committee
August 12	September 15
September 15	November 3
November 3	December 14
May 11	January 5
	February 2
	April 22

2.3 Public Participation Opportunities

In addition to the Policy and Technical Committee meetings, the JLUS process conducted a series of public involvement events in jurisdictions around the installation. These meetings gave residents an opportunity to understand the



existing issues, review draft land use compatibility tools, and provide input on implementation strategies.

Public workshops were held on:

October 6, 7, 11 and 12 in the Cities of Pembroke, Hinesville, Richmond Hill and Savannah;

November 29 and 30 and December 1 in the Cities of Pembroke, Hinesville and Savannah;

August 3, 10 and 11 2005 in the Cities of Pembroke, Savannah and Hinesville.

In addition to public information forums, the JLUS team met with large landowners in the region on December 14, 2004 to explain the JLUS process and provide information about conservation opportunities. The team also posted presentation materials on the Coastal Georgia Regional Development Center web site (www.coastalgeorgiardc.org).



3.1 Chronology of Events

This JLUS document is one step in an ongoing effort by local governments and Fort Stewart/HAAF representatives to address compatibility around the complex. The following timeline of actions represents a desire on the part of local and military officials to be proactive in dealing with land use, safety, access, and noise issues and to protect the health and well-being of both the military and civilian communities.

February 2004 - Fort Stewart Installation Environment Noise Management Plan

February 2004 – Hunter Army Airfield Installation Environment Noise Management Plan

August 14 2004 – Fort Stewart/Hunter Army Airfield Kick-Off Meeting

September 15 2004 – Joint Policy and Technical Committee Meeting

October 2004 – First set of public information sessions

November 3 2004 - Joint Policy and Technical Committee Meeting

November and December 2004 – Second set of public information sessions and large landowners meeting

February 2005 – Draft Technical Memorandum containing recommendations circulated to Technical Committee

March 2005 – Final Technical Memorandum circulated to Policy Committee members

May 2005- Policy Committee meeting to accept content of Technical Memorandum

June 15 2005 –Draft Final JLUS Report circulated to Technical and Policy Committee members

August 2005 – Final public information sessions

September 2005 – Final JLUS Report submitted



3.2 Economic Impacts of the Installation

Over the years, the Fort Stewart/HAAF military complex has become a major economic force in southeast Georgia. The military and civilian payroll, coupled with spending in goods and services, infuse the regional economy with almost two billion dollars each year.

According to a study conducted by the Bureau of Business Research & Economic Development at Georgia Southern University in 2002, Fort Stewart/HAAF account for approximately 75 percent of the total direct economic effect of the military in Region 12. Several key points of the study include:

- For every 100 military and civilian jobs created the region gains an additional 84 jobs (i.e., an estimated jobs multiplier of 1.84);
- Every dollar spent by the military creates an additional \$1.10 in economic activity (i.e., the estimated expenditures multiplier is 2.1);
- Ft. Stewart/HAAF account for \$1.007 billion in payroll, contracts and other operating budget expenses; and
- Those dollars add \$2.115 billion to the region's economy annually.

Today, Fort Stewart/HAAF has over 22,000 assigned military personnel and over 3,000 civilian employees. The post processed approximately 26,500 annual and weekend reserve component trainees during FY03. The State of Georgia overall is home to approximately 35,000 military retirees.

3.3 Military History

Fort Stewart

Known as the "Army's Premier Power Projection Platform" on the Atlantic Coast, Fort Stewart/HAAF is the home of the 3rd Infantry Division. Fort Stewart began as a modest-sized anti-aircraft training center in 1940 and later in World War II functioned as a holding area for German and Italian prisoners of war, operated a Cook and Bakers School, and served as a staging area for a number of Army postal units. At the conclusion of the war, Fort Stewart served briefly as a separation center for redeployed soldiers. Following the formal end of hostilities in September of 1945, the post remained inactive for a period of five years.



When the Korean War began, Fort Stewart resumed operations as the newly designated 3rd Army Anti-Aircraft Artillery Training Center. After Korea, the Army designated Fort Stewart as a permanent installation. The Cuban missile crisis and the Cold War tensions kept Fort Stewart in an active training role until the end of the Vietnam War in 1973. At that time, the Air Force closed HAAF and Fort Stewart limited its operations to National Guard training. The Army reactivated Fort Stewart in 1974 with the 1st Battalion, 75th Infantry Regiment (Army Ranger unit). Since 1996, Fort Stewart has been home to the 3rd Infantry Division (ID). The 3rd ID consists of 1st Brigade Combat Team, 2nd Brigade, 3rd Brigade, 4th Brigade, Aviation Brigade, Division Fires Brigade, and the Division Support Brigade. The complex also houses a variety of tenant units and agencies.

Wright Army Airfield

Wright Army Airfield (WAAF, formerly Liberty Field) provides Fort Stewart with a fully functional airport east of the installation cantonment area and tactical range complexes, along the southern installation boundary near Hinesville. Currently, Liberty County and the City of Hinesville are negotiating with Fort Stewart/HAAF and DoD officials to convert WAAF into a joint-use airport serving the needs of the city and county. The plans also include an industrial park that would be on the Fort Stewart/City of Flemington border, and a bypass that would connect the park with Highway 84.

Hunter Army Airfield

The Army Air Corps first built aviation facilities near Savannah during the summer of 1940. Over the decades, HAAF has generally followed the same activation and deactivation patterns as Fort Stewart. In 1967, the U.S. Air Force transferred the airfield to the Army, where today it operates as a fully integrated component of the region's military complex. Currently, HAAF is the primary Power Projection Platform for air operations associated with the 3rd Infantry Division (Mechanized) and non-divisional units. The airfield also hosts the largest helicopter unit in the U.S. Coast Guard, and provides Savannah and Coastal Georgia with ongoing search and rescue coverage.



An Integrated Installation: Fort Stewart's Current Mission

Over the years, Fort Stewart has grown to almost 280,000 acres, becoming the largest Army installation east of the Mississippi River. Fort Stewart's primary mission is to:

- Provide the nation with a trained, equipped, and ready fighting force composed of the 3rd Infantry Division (Mechanized), known as the "Rock of the Marne," and other attached units capable of deploying rapidly anywhere in the world in support of national objectives.
- Upon order, Fort Stewart is ready to support, train, and deploy mobilized Reserve Component units in accordance with national directives to accomplish their wartime and peacetime missions.
- As a power projection platform, HAAF has a primary mission to provide aviation support to the 3rd ID (M) at Fort Stewart. Designated support functions include the testing, qualifying, and instruction of officers and enlisted personnel in aviation techniques and tactical operations. Hunter Army Airfield additionally supports various non-divisional and military tenant activities, including the development and training of a portion of the Army's Rapid Deployment Force.

3.4 Current and Future Military Operations

Fort Stewart divides its 280,000 acres of land into 120 maneuver training areas. These areas total over 191,000 acres (including 19,985 acres of impact areas), or 68 percent of Fort Stewart's total property. The Army conducts live-fire training exercises involving mortars, artillery, and tanks at Fort Stewart on a 24 hour a day basis throughout the year.

The ranges provide training and qualification firing for individual and crew-served weapons systems, anti-tank weapons, demolitions, helicopter gunnery, 25 mm gun and 120 mm tank gun firing. The artillery and mortar firing points (approximately 90) can support MLRS, 105 mm through 155 mm howitzers and 60 mm through



120 mm mortars. HAAF and WAAF (Class A runways) serve both fixed and rotary-wing aircraft.

The HAAF facility consists of 11 training areas with a main training area of approximately 100 acres in the southwest corner of the runway. HAAF also hosts the U.S. Army's longest runway, which at 11,000 feet can accommodate any aircraft in the civilian or military fleet.

Fort Stewart Ground Training Ranges

Soldiers conduct live-fire ground training exercises at Fort Stewart within the following areas:

- 190,700 acres of maneuver training land;
- 120 maneuver/exercise areas;
- 19,985 acres of impact areas;
- 14 small arms ranges;
- Eight dismounted live fire assault ranges;
- Two tank/Bradley sub caliber ranges;
- Five tank/Bradley gunnery ranges;
- One MK-19 Qualification range;
- Three aerial gunnery ranges;
- One Demolition Range;
- One Close Quarter Battle facility;
- One MOUT live fire facility;
- One AT/AP HE Range;
- Three Ambush Lanes;
- 85 artillery firing points;
- Four mortar points;
- Four observation posts; and
- 10 Multiple Launch Rocket System (MLRS) launch points.

The small arms ranges (used for arms .50 caliber and below) lie north of the cantonment area in the southern portion of the installation. Soldiers fire artillery, mortar, and MLRS at approximately 100 firing points (85 artillery, 5 mortar, and 10 MLRS) throughout the training ranges in Fort Stewart, using direct and indirect fire.



The Red Cloud Range Complex contains the armor/mechanized infantry ranges, including a 1,600 acre multiple-purpose range complex (MPRC) RC-Alpha, Red Cloud-Echo (RC-E), Red Cloud-Foxtrot (RC-F), Red Cloud-Golf (RC-G), and Red Cloud-Hotel (RC-H). The armor/mechanized infantry ranges can accommodate the simultaneous moving of tanks and firing of munitions to simulate battle conditions for purposes of tank crew qualifications. Crews fire TPDS-T, HEAT-TPT, and HEP-TPT projectiles, along with 25 mm, .50 caliber, TOW/Dragon, 2.75-inch rocket, MK-19, and other small arms. All rounds fired at the Red Cloud Range Complex are inert.

Fort Stewart Aerial Training Ranges

Aerial training areas within Fort Stewart include:

- 7 drop zones;
- 13 stagefields/airstrips;
- 1 assault landing strip; and
- Camp Oliver Airstrip and WAAF.

Fort Stewart has seven drop zones, eight landing zones and three airstrips throughout the installation. Use at these drop zones varies from 1 to 72 days annually with 2 to 218 missions each year at 250 – 6,000 feet altitude above ground level (AGL).

The Mine Clearing Line Charge (MICLIC) uses 1,854 pounds of explosives that are detonated linearly along a 100-meter line in the Galahad DZ in the northeast portion of the installation.

Soldiers practice aerial gunnery throughout the installation, including the 7.62 mm door gun, 20 mm gun, 30 mm gun, inert TOW missile and the HELLFIRE missile.

Wright Army Airfield (WAAF) is east of the cantonment area along the southern post boundary. WAAF operates 365 days each year, supporting Army, Navy, Marine, Army Reserve, Air National Guard, Army National Guard, and some commercial aviation. During 2004, WAAF conducted 17,753 air operations.



As noted earlier, Liberty County and the City of Hinesville are in negotiations with Fort Stewart and the Department of Defense officials to make WAAF into a joint-use airport serving the economic development needs of the city and the county.

Other Training Areas near Fort Stewart

Other ranges within the Fort Stewart installation include the Demolition Range, Squad/Platoon Assault Course, Close Quarter Battle Complex, Tirehouse, AGR 1, 2, and 3, and the Luzon Range.

Fort Stewart also has four major low-level helicopter training routes (Blue, White, Purple and Red), primarily along the installation boundary, and State Routes 119 and 144.

The installation also contains six helipads within its boundaries, including the Command Pad, Winn Army Community Hospital, NCO Academy, National Guard Training Site and others.

The current military environment is extremely fluid and dynamic. The Fort Stewart/HAAF complex has been operating at a high tempo since the initiation of hostilities in Afghanistan and Iraq. The installation's foreseeable military mission will continue to evolve as a result of both planned growth and broader Army policy.

Currently, Fort Stewart plans to develop a Digital Multi-Purpose Range Complex (DMPRC) on the post with operation scheduled to begin in 2007. The purpose of the DMPTR is to:

- increase training capacity;
- increase training realism;
- conduct coordinated training exercises; and
- allow for digital communications, targeting and scoring equipment.

As discussed more fully in Section 4, operations at the new DMPTR would affect the post's noise environment. Munitions fired at the facilities would not generate more noise, but additional range capacity would allow for a higher throughput of training units, therefore increasing the intensity and frequency of range use.



To better meet today's global security threats, the Army is pursuing a policy of modularity, which converts large units attached to Divisions into smaller stand-alone units that can deploy rapidly to areas of conflict anywhere in the world. These stand-alone, or modular, units are called Units of Action (UAs).

The Army would reorganize by shifting units and personnel from one installation to another, restructuring troops on a given installation or some combination. Modular reorganization of forces at Fort Stewart/HAAF could result in more intensive use of installation training lands, an increased aviation component, and more soldiers stationed at the post.

Hunter Army Airfield Training

Currently, HAAF is home to 101 aircraft. During 2004, the assigned aircraft conducted 52,630 operations. The low-level transition routes accommodate rotary wing use during the day, night vision devices and special visual flight rules. These routes are designed to provide safe transitions to and from Fort Stewart using terrain flight altitudes. The five training routes are:

1. Little Neck. This is used one way (eastbound) from Tina's Landing to Reporting Point (RP) Chinook.
2. King's Ferry. This route is used one way (westbound) to identification point (IP) Cobra Bridge at Forest River, west along Little Ogeechee River, southeast to Hodges Airport to RP Church, and then west to Kings Ferry
3. Belfast. This is a one way (eastbound) route from KP 6 to Belfast and Ogeechee River, at this IP fly an approximate heading of 100 degrees to Grove Point, turn to a heading of 020 degrees to Lotts Island for landing at HAAF.
4. External Load Operations (ELO). Aircraft departing HAAF will proceed westbound from the airfield remaining clear of the Ammo Supply Point, then south passing between RP Cobra Bridge and Lotts Island.
5. Administrative Route. This route is used for off-reservation flights between HAAF and Wright Army Airfield located at Fort Stewart.



3.6 Regional Demographics and Growth Patterns

The coastal Georgia region displays the state's second fastest percentage rate of growth. Virtually all of the counties in the Joint Land Use Study planning area will continue to grow over the next decade as shown in Table 4. The US Census Bureau's list of Georgia's most rapidly growing counties includes Bryan and Effingham. The Savannah-Chatham County Metropolitan Planning Commission's 2005 Tricentennial Plan specifically identifies West Chatham as a high growth area, particularly as Savannah and unincorporated East Chatham build out on remaining land. The plan projects that West Chatham, including municipalities, will add 45,000 persons (73 percent) by 2030.

These trends could raise compatibility issues with Fort Stewart/HAAF operations in the foreseeable future, particularly as north Bryan County's population spreads south and unincorporated West Chatham and south Bryan County, including the City of Richmond Hill, extend west. The state's Office of Planning and Budget (OPB) data indicate a future decrease in the residential population of Liberty County. The military presence at Fort Stewart/HAAF strongly influences the county's population base. While OPD projections reflect an assumed troop reduction, proposed modularity may actually increase the numbers of soldiers stationed at the complex, placing Liberty County on a growth path similar to the region's other jurisdictions.

Table 4. Regional Growth Trends

County	2000 Pop	2010 Projection	2015 Household Projection	2015 Pop Projection	2000-2015 Growth Rate
Bryan	23,417	33,135	38,603	38,746	65.5%
Bulloch	55,983	64,275	64,33	68,235	21.9%
Chatham	232,048	244,446	239,959	249,580	7.6%
Effingham	37,535	54,807	64,619	64,874	72.8%
Evans	10,495	13,315	14,282	14,905	42.0%
Liberty	61,610	55,431	49,097	54,197	-12.0%
Long	10,304	11,881	12,729	12,729	23.5%
Tattnall	22,305	23,094	19,749	23,549	5.6%

Source: State of Georgia Office of Planning and Budget, 2005



3.7 Environmental Resources

The Fort Stewart/HAAF complex lies within the Georgia Coastal Plain and includes a number of saltwater marshes, wetlands, and freshwater estuaries. This unique coastal environment is one of the most ecologically rich and diverse places in the world.

Figure 2 shows the major natural features of the region, including water bodies, wetlands, conservation lands, federally-owned lands, and Department of Natural Resource lands. Areas of particular conservation value include the Ogeechee River area east of the post and silviculture land to the north.

To protect this delicate ecosystem, Fort Stewart/HAAF, The Trust for Public Land, The Nature Conservancy, and the Georgia Land Trust formed the Coastal Georgia Private Lands Initiative to identify environmentally sensitive resources near the installation and promote conservation strategies. Referred to throughout the remainder of this study as the Army Compatible Use Buffer (ACUB), this approach supports the goal of land use compatibility by maintaining open space through cooperative agreements with landowners. The intent of the ACUB strategy is to reduce encroachment risk, protect high-value conservation targets, and link up with other conservation properties in the region to create an integrated network of greenspace.

The installation also forms a core habitat area for many species of plants and animals. Fort Stewart/HAAF currently contain six species that are listed as threatened or endangered, including the bald eagle, wood stork, shortnose sturgeon, and red cockaded woodpecker. Increasing development on surrounding civilian lands further fragments and reduces valuable wildlife habitat, which in turn isolates military lands as the remaining intact natural areas. Species drawn to reservation lands could trigger federal protections that restrict the use of installation lands for training purposes.

Along with the protection of threatened or endangered species, the Army manages the longleaf pine ecosystem on the post through periodic prescribed burns. The burns maintain the environmental health of the forest and protect visibility and maneuver room on range lands.



3.8 State Conservation Tools

In December 2003, an Advisory Council appointed by Governor Sonny Perdue created the Georgia Land Conservation Partnership Plan. The Plan urges conservation, but also recommends that most protected land in Georgia remain in private ownership. In 2005, the Governor created the enabling legislation, the Georgia Land Conservation Act.

The Act establishes the Georgia Land Conservation Trust Fund and the Georgia Land Conservation Revolving Loan Fund managed by the Georgia Environmental Facility Authority.

All local governments and the Georgia Department of Natural Resources are eligible to receive loans and grants from a pool of \$100 million in state, federal and private funding for the purchase of conservation lands.

The Plan further recommends conservation through the use of tools, such as the purchase and donation of fee simple title, the leasing of land, conservation easements, and the purchase of agricultural easements, along with local land use controls, such as overlay zoning, agricultural easements, and the transfer of development rights.

The Policy and Technical Committees have identified the Georgia Land Conservation Program as one of the best opportunities to conserve land around the installation (See the Appendix).



The red-cockaded woodpecker is among the threatened or endangered species that occur on Fort Stewart/HAAF lands.



4.1 Operational Impacts

The Fort Stewart/HAAF complex generates operational impacts and issues that are typical of Army installations around the country, including:

- physical adjacency to training operations;
- conservation and natural habitat protection;
- noise;
- vibration;
- dust;
- smoke;
- air safety (both for people on the ground and for pilots);
- the physical security of the installation;
- the risk of either civilian or military people or vehicles moving inadvertently from one side of the installation to the other;
- the need for flexibility to accommodate expanding existing and future military missions; and
- visual compatibility with adjacent communities.

4.2 Installation Compatible Use Zone

The Army's Installation Compatible Use Zone (ICUZ) is a program designed to assess the noise and safety effects caused by proximity to an active military installation. Most of the noise associated with Fort Stewart/HAAF results from the following activities:

- small arms firing;
- large arms weapons firing;
- demolitions; and
- aviation, particularly helicopters

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 Stewart/HAAF.



Though the impulsive noise produced by large arms weaponry can cause vibration and the shaking of nearby buildings, the noise is air-borne. Sound is not transmitted through the ground as a result of mortar or artillery impact on the post, but instead travels through the air.

Noise in excess of 55 dB can become intrusive and continued exposure to noise above the 85 dBA threshold can, over time, cause hearing loss.

The contours around the post reflect an annualized noise measure that converts noise varying from peak bursts to relative quiet into a steady measure of acoustic energy over a 24 hour period. The contours essentially take all operations that occur at the military installation over the year and divide by 365 days, producing the average day-night sound level (DNL).

The Army depicts noise based on a computer simulation that processes data such as the type of weapons fired from each range or firing point including demolitions, the number and type of rounds fired from each weapon, the location of targets for each range or firing point and the amount of propellant used to reach the target. 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.

In addition to operational characteristics, such as the type of weaponry used, a variety of 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. For example:

- wind moves the air and thus carries noise farther;



- humid air has more density, thus carrying noise farther from the source; and
- low, dense cloud cover can reflect more noise to the ground, thus increasing sound intensity.

Experts at the Environmental Noise Program, US Army Center for Health Promotion and Preventive Medicine, created the noise zones shown in Figures 3 through 7. The zones and corresponding land use guidance as identified by the Army are as follows:

Noise Zone III. Noise Zone III (NZ III) consists of the immediate areas around the source of the noise in which the A-weighted DNL (ADNL) is more than 75 decibels, and the C-weighted DNL (CDNL) exceeds 70 decibels. Guidance indicates that noise in this zone is severe enough to cause conflicts with almost all activities, particularly sensitive land uses, such as housing, schools, medical facilities, and places of worship.

Noise Zone II. Noise Zone II (NZ II) consists of an area where the A-weighted DNL is between 65 and 75 decibels and the C-weighted DNL is between 62 and 70 decibels. Guidance deems noise exposure within this area to be significant and recommends limiting use of land to non-sensitive activities such as industry, manufacturing, transportation, and agriculture. However, if the community determines that land in NZ II areas must be used for residential purposes, guidance suggests that the design and construction of the buildings incorporate noise level reduction (NLR) features to minimize the annoyance experienced by residents.

Noise Zone I. Noise Zone I (NZ I) includes areas around a noise source in which the DNL is less than 65 dBA and less than 62 dBC. Since the noise exposure in this zone is low enough that it does not trigger compatibility with sensitive uses, Figures 3 through 7 do not show NZ I contours.

Land Use Planning Zone. The noise contours, 65 ADNL and 62CDNL, represent an annual average that separates the Noise Zone II, which has compatibility issues, from the fully compatible NZ I. Since the noise environment at the installation varies daily and seasonally, the Land Use Planning Zone (LUPZ) contour more broadly encompasses off-post lands, where on particularly active days, noise and the resulting community annoyance can approach levels typically associated with NZ II. The LUPZ, thus, gives the installation more flexibility for performing its mission and better reflects actual noise conditions during a period of heightened



activity.

These noise contours should be viewed as a planning tool, not as a series of discrete lines that sharply divide noise-affected land from non-noise affected areas. But, contours are a useful framework for identifying those off-post areas in which noise exposure may be high enough to generate annoyance among a certain percentage of people.

As shown in Figure 3 – Small Arms Noise Contours, all noise zones associated with small arms firing are contained on post lands and maneuver areas and, therefore, generally do not pose compatibility issues with surrounding civilian uses.

Noise caused by the firing of heavy weaponry or large arms (large arms weapons 20 mm and greater), such as the main guns of tanks training at the Red Cloud Complex, however, affect noise levels experienced on off-post lands as shown in Figure 4 – Existing Large Arms Noise Contours.

As shown on Figure 5, the LUPZ extends beyond the installation boundary, affecting the City of Pembroke and Bryan County to the north, and the City of Hinesville and Liberty County on the south. Land within this zone, particularly during periods of more intense activity, can be subject to noise high enough to trigger annoyance. The more severe NZ II caused from large arms firing crosses the boundary north of the post to include portions of Bryan County. Noise exposure in this zone is sufficient to raise compatibility issues with sensitive uses. The most severe of the zones, NZ III, does not cross post boundaries.

As noted earlier, a proposed Digital Multi-Purpose Range Complex (DMPRC) would affect the noise setting around the post due to increased intensity of range use. Figure 5 shows the noise contours that would result from operation of the existing Red Cloud Complex and the DMPRC. NZ II contours would extend farther to the north to an area just below the City of Pembroke and also cross south of the installation boundary near the Cities of Flemington and Gum Branch. Since these contours reflect noise in the foreseeable future when the DMPRC begins operation in approximately 2009, analyses of compatibility issues in later sections of this report reflect the proposed noise contours.

In addition to assessing the impacts of noise on surrounding land uses, the Army's ICUZ program examines the relationship among nearby land uses, aircraft accident



potential, and possible hazards to air navigation. The air safety component of ICUZ identifies areas around the airfield where a mishap would be most likely to occur and also assesses the likely impact of any single accident.

The following ICUZ air safety zones exist around Wright Army Airfield and Hunter Army Airfield.

- 🕒 ▪ **Clear Zone (CZ).** The Clear Zone is an area 1,000 feet wide by 3,000 feet long at the immediate ends of the runway. The accident potential in this area is sufficient to recommend the prohibition of any structures in the CZ.
- **Accident Potential Zone I (APZ I).** APZ I is less critical than the CZ, but still possesses significant potential for accidents. A wide variety of industrial, manufacturing, transportation, open space and agricultural uses can exist safely within this 1,000-foot wide by 2,500-foot long area just beyond the CZ. However, uses that concentrate people in small areas, such as higher density housing pose a conflict with the safety risks of this zone.
- 🕒 ▪ **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 also 1,000 feet wide and extends 2,500 feet beyond APZ I. 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.

As shown in Figure 6, the accident potential zones from WAAF cross the Fort Stewart boundary to affect a portion of unincorporated Liberty County. Air safety and noise zones cross both to the west and east of HAAF, affecting the City of Savannah and West Chatham (see Figure 7).

4.4 Analysis of Current Land Use

The following analysis assesses the compatibility of existing civilian land uses around the installation. When compatible, land uses can exist next to each other without causing interference or exposing people to undue safety risks or nuisance. In this JLUS context, Army training activities raise compatibility issues when next to the following nearby land uses:



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

For purposes of evaluating compatibility, the JLUS draws guidance from The Federal Interagency Committee on Urban Noise (FICUN) land use guidelines (FICUN 1980) and the DoD guidelines for compatible land use for clear zones and accident potential zones (U.S. Army 1981).

These compatibility guidelines are standards only and do not determine acceptable uses of land within communities. Only local governments have the authority to establish permissible land uses and to define the relationship between specific properties and noise or safety contours. (See Appendix for a full listing of land use compatibility guidelines)

Table 5 assesses the compatibility of various land uses relative to levels of noise exposure. The guidelines below are based on the A-weighting function, which evaluates noise from transportation (vehicle and aircraft), small arms, and continuous noise sources. Most of the noise from post operations is impulsive and, therefore, better expressed with a C-weighting that captures the effects of low frequency sound. As noted earlier, the impulsive sound pressure from the firing of large weapons and the detonation of explosive charges can cause structures to vibrate and, therefore, tends to be more annoying than A-weighted noises of the same decibel level. Table 6 recommends compatible land uses within the various air safety zones around WAAF and HAAF.



Table 5. Noise Compatibility Guidelines

FICUN	NZ I (dB)		NZ II (dB)		NZ III (dB)	
	< 55	55 to 65	65 to 70	70 to 75	75 to 80	80 to 85
Households	Y	C	C	C	N	N
Industrial	Y	Y	Y	C	C	C
Retail – General	Y	Y	Y	C	C	N
Restaurants	Y	Y	Y	C	C	N
Services	Y	Y	Y	C	C	N
Hospitals	Y	C	C	C	N	N
Government	Y	C	C	C	C	N
Education	Y	Y	Y	Y	N	N
Public Assembly	Y	Y	Y	N	N	N
Parks	Y	C	C	C	N	N
Agriculture	Y	Y	C	C	C	C

Table 6. Air Safety Compatibility Guidelines

LAND USE	APZ II	APZ I	CLEAR ZONE
Households	C	N	N
Industrial	Y	Y	N
Retail	Y	N	N
Personal Services	Y	N	N
Public Services	C	N	N
Outdoor Recreation	Y	C	N
Agriculture	C	Y	Y

Note: Y = compatible use

C = compatible use with some conditions (identified in Appendix)

N = non-compatible use

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. For conditionally compatible residential land uses, guidelines suggest consideration of the following factors:

- Is there a demonstrated community need for residential use that would not be met if development were prohibited in these zones?
- Where the community determines that residential uses are desired, structures should incorporate noise level reduction measures of at least 25 dB (65-70 ADNL) and 30 dB (70-75 ADNL).
- Noise level reduction criteria will not eliminate outdoor noise problems. However, building location and site planning, design, and use of berms and barriers can help mitigate outdoor noise exposure particularly from ground level transportation sources. Measures that reduce noise at a site should be used wherever practical in preference to measures that only protect interior spaces.

Guidelines deem noise exposure that exceeds DNL 75 dB to be “incompatible” with all residential uses. Many uses, such as manufacturing, retail, government facilities, and agriculture, however, can be suitable even within a relatively high noise setting.

Guidelines also strongly discourage any uses within the Clear Zone around airfields due to the risk of an aircraft mishap. However, non-residential activities can maintain compatibility with designated Accidental Potential Zones.

The eastern boundary of Fort Stewart includes the Ogeechee River, an area of significant conservation value. Land to the north of the post features major tracts currently in timber production, along with the City of Pembroke. The western boundary of the installation remains primarily agricultural. Pockets of development, such as the City of Hinesville, surround the post on the south, though most of these uses are relatively low density.

Land east of HAAF is within the City of Savannah and includes the most significant urban pattern in proximity to air safety and noise impacts. Areas to the west of the HAAF runways are primarily undeveloped, but under significant growth pressure.

While much of the land adjacent to the installation is rural or low density in character, a review of existing land use patterns, growth trends, and operational issues identifies the following areas of concern:

- north of Fort Stewart in the City of Pembroke and Bryan County;



- south of Fort Stewart in the City of Hinesville and Liberty County;
- east and west of HAAF.

For purposes of compatibility analysis, Figures 9, 10, 11 and 12 focus more closely on these areas to identify existing land use conflicts.

As Figure 8 indicates, pockets of existing residential use in Bryan County just north of the post may raise compatibility issues with military operations. Current residential activity in the City of Flemington and the City of Hinesville south of the post along Fort Stewart Road/Old Sunbury Road could be subject to noise levels sufficient to trigger annoyance (see Figure 9). As shown in Figure 10, several pockets of higher intensity commercial and residential are subject to the air safety risks associated with HAAF's eastern flight operations. Areas of lower density housing farther east may also be subject to noise conflicts during more intense training periods. Land west of HAAF displays some potential conflicts between current residential activity and aviation noise (see Figure 11). Though existing land use patterns do not demonstrate significant encroachment within the designated air safety zones, trends indicate that this area is an emerging growth zone in west Chatham County.

4.5 Analysis of Future Land Use and Growth

Two future land use patterns and growth trends within the region could raise compatibility issues with installation operations in the foreseeable future—the spread of Savannah's and Chatham County's expanding population to areas west of HAAF and the emergence of dispersed residential uses within rural areas north of Fort Stewart.

Though the City of Pembroke continues to grow primarily north along Highway 119, Figures 13 and 14 reflect increasing residential activity north of the installation, particularly along State Route 204 in Bryan County (see Figure 12 and 13). Figures 14 and 15 demonstrate the emerging risk of encroachment on land west of HAAF.

Communities south of the post, including the City of Hinesville, Liberty County, and the City of Flemington also show some planned residential development near the installation, particularly near WAAF and the City of Gum Branch (see Figures 16 and 17).



4.6 Analysis of Zoning

Zoning patterns north of the installation in Bryan County show major areas of permissible residential development in areas that are subject to high noise levels from post training operations (see Figure 18). The Cities of Hinesville and Flemington zone for some residential uses, including high density housing, near the noise and safety impacts associated with WAAF (see Figure 19). Figure 20 shows some areas in the City of Savannah subject to noise and air safety risks as zoned for intense commercial activity and medium density housing. Chatham County (see Figure 21) currently zones land west of HAAF for industrial and residential purposes (Residential-Agriculture district with a minimum lot size of 6,000 sq ft in areas served by public water and sewer.)

4.7 Current Army Compatibility Tools

The Army has a variety of tools in place to address operational impacts, such as noise, vibration, or air safety, on off-post lands. The primary tool for mitigating noise is the Installation Operational Noise Management Plan, which includes identification of the Installation Compatible Use Zone (ICUZ) noise contours discussed earlier, education and outreach components, noise complaint management procedures, and noise/vibration mitigation. Fort Stewart's Directorate of Public Works - Environmental and Natural Resources Division with support from Public Affairs Office (PAO) and US Army Center for Health Promotion and Preventive Medicine also plans to host open house events for the City of Pembroke before construction of the DMPTR to address current and foreseeable noise issues. Also, the installation's Range Control can provide an electronic Range Bulletin to the PAO for posting on the Fort Stewart/HAAF web site to give the public a general schedule of activities.

Additionally, the Army participates in the Sustainable Range Program (SRP) Outreach. The SRP Outreach goals are to: improve public support; increase public awareness of current range management actions; communicate the Army's training doctrine and philosophy; ensure consistency with broader Army and DoD efforts; and provide installations with guidance and useful tools to carry out effective community outreach. In accordance with the SRP Outreach and Communication Campaign Plan and implementing instructions from the Installation Management Agency, Senior Mission and Garrison Commanders from Fort Stewart/HAAF will



conduct SRP outreach efforts using the installation training support package developed by the Directorate of Training, Training Simulations Division.

4.8 Current State and Local Compatibility Tools

The State of Georgia has passed legislation that requires local planning entities to request written comments from military commanders when considering proposed zoning decisions on land that is adjacent to or within 3,000 feet of an installation or within 3,000 feet of a Clear Zone or Accident Potential Zones I and II.

Comments are intended to address issues such as land use compatibility, any potentially adverse affects on military operations, reasonable economic use of the property, safety risks, and consistency with local land use plans.

In addition to formalizing coordination during land use decisions, the state Department of Community Affairs requires all counties and municipalities to develop a comprehensive plan to maintain their Qualified Local Government status and thereby remain eligible to receive certain state grants and permits. The comprehensive plans can serve as a strong foundational document to guide collaboration with the military and identify land use compatibility policy.

In general, the communities of the region maintain a collaborative relationship with Fort Stewart/HAAF. The local governments, however, vary greatly in the availability of specific tools to sustain compatible, flexible land use around the installation. Evans, Long and Tattnall Counties currently do not regulate land through zoning ordinances. Several local governments, including the City of Pembroke, the City of Hinesville, the City of Richmond Hill, Bryan County and Liberty County have several basic land use control mechanisms in place that could support compatibility around installations, such as Planned Unit Development zoning.

The Chatham County-Savannah Metropolitan Planning Commission's Tricentennial Plan contains language on establishing non-residential buffer areas to the west of Hunter Army Air Field in Accident Potential Zones and intensive Noise Zones. The plan also supports cluster and conservation design, and New Urban development options.



No local governments in the region implement tools specifically designed to address military/civilian compatibility issues, such as sound attenuation of buildings in high noise areas or disclosure of proximity to a military installation as part of real estate transactions.

The section contains a series of tools that the Army and the local governments can choose to adopt during the implementation phase of the JLUS process. All of the entities participating in the JLUS, including the Army, cities and counties, retain the prerogative of selecting those compatibility tools that best reflect the specific issues, concerns, and needs of each stakeholder.

The tools identified below are the result of a thorough, good-faith effort by the Technical and Policy Committees to assess the existing and foreseeable effects of Fort Stewart/HAAF on adjacent land and to develop a set of options that promote collaborative regional decision-making and seek to balance community and military interests.

The JLUS report is intended to frame two general questions:

- 1. What can we do to improve current and future land use compatibility around Fort Stewart/Hunter Army Airfield?*
- 2. Where can we use the tools that we identify?*

To address these questions, this section organizes information into two parts:

The first part (Land Use Compatibility Tools) includes a list of tools that Technical and Policy Committee members identified as the most promising options for reducing current and future conflicts between civilian and military land uses. The tools include measures that are designed specifically for certain areas around Fort Stewart/HAAF; more general tools that are appropriate for all governments in the region; and tools intended for Army implementation.

The second section (Areas of Concern) describes more fully where area-specific tools could be used, supported by Figures 22 through 26.

List of Land Use Compatibility Tools

The Technical Committee evaluated a wide range of tools based on criteria such as: feasibility; likely effectiveness; the availability of resources for implementation; the ability to protect military missions and installation sustainability; the ability to protect the economic health of the region and individual property rights; and the overall ability to protect health, safety, welfare, and quality of life.



The tools are also intended to address a variety of possible land use and operational issues, including physical adjacency to Fort Stewart/HAAF, conservation or natural resource value, noise, vibration, dust, smoke, air safety (both for people on the ground and for pilots), the physical security of the installations, the need for flexibility to accommodate expanding existing and future military missions, and visual compatibility.

The Fort Stewart/HAAF Policy Committee reviewed Technical Committee recommendations and accepted the following tools as implementation options.

Area-Specific Tools

These tools address the land use and operational issues associated with specific areas around Fort Stewart/HAAF. The Areas of Concern section describes where these tools can be most effectively applied.

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, maintaining agriculture/silviculture, and conserving open spaces and rural character.

As part of this strategy, local governments in the region would explore partnerships with the Army, the State of Georgia, and non-profit conservation entities, such as the Trust for Public Land and The Nature Conservancy, to secure conservation easements or to purchase development rights from willing sellers of land in proximity to Fort Stewart/HAAF.

In 2002, Fort Stewart/Hunter Army Airfield, the Trust for Public Land, The Nature Conservancy, and the Georgia Land Trust formed a special partnership—the Coastal Georgia Private Lands Initiative (CGPLI)—to promote conservation of a buffer around Fort Stewart and Hunter Army Airfield. The CGPLI initiative is now part of the Army Compatible Use Buffer (ACUB) program.



The initiative seeks to protect lands primarily through a conservation easement in which a landowner exchanges some of the development potential of a tract for tax incentives. Other tools for conservation could include transfer of development rights and purchase of development rights, which compensates the owner for the assessed market value of development potential lost when the land remains permanently undeveloped. The partners in the CGPLI have been in the process of contacting landowners around the installation to determine their interest in participating in the program. All such transactions would be totally voluntary.

2. **General Land Use Guidelines:** Land use compatibility guidelines encourage or require activities (industry, retail, recreation, agriculture, very low density/rural residential) that maintain compatibility with post operations. Compatible activities generally avoid the concentration of people and show lower sensitivity to noise/vibration, smoke and other possible operational impacts. Local governments would implement such guidelines through Comprehensive Plan policy and zoning.

The Areas of Concern section includes more detail on land use guidelines for specific areas around the post. The appendix also contains land use compatibility guidelines used by the Army to gauge the suitability of activities relative to noise exposure.

3. **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 would typically require attenuation as part of building code enforcement for new residential and other noise sensitive construction in certain noise affected areas.
4. **Disclosure:** Disclosure requires the release of information on possible impacts (dust, smoke, noise/vibration, vehicular movements, air safety zones) to prospective buyers or renters during real estate transactions for properties close to Fort Stewart/HAAF. Local governments would implement this tool by adopting a local real estate disclosure ordinance. See the Appendix for sample disclosure forms.
5. **Infrastructure:** As part of this strategy, local governments would consider the impacts of both public and private infrastructure installation/extension



(e.g. water and sewer facilities) into noise and safety affected areas around Fort Stewart/HAAF. 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.

6. **Coordination:** Under this approach, local governments would promote collaboration by sharing information on specific community development proposals (rezonings and subdivisions) as part of a Fort Stewart/HAAF JLUS Regional Coordinating Committee described below. Such coordination already takes place as required by Georgia law within a 3,000-foot buffer around the installation boundary. The Army would also share information about on-post activity within a 3,000-foot buffer inside the installation boundary and in instances where on-post activities may increase off-post noise levels or expand noise zones farther off the installation.
7. **Air Safety Land Use Guidelines:** These are compatibility guidelines focused specifically on land uses near airfields. The guidelines encourage or require land uses that maintain compatibility with safe air space operations, including limiting concentrations of people, properly siting and marking tall structures to protect airspace zones, and meeting the approval of the Federal Aviation Administration and Army Aviation.
8. **Clustering or Transfer of Development Rights:** 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 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.

Local governments could also pursue a pure transfer of development rights (TDR) program, which shifts growth from a designated “sending area” with development constraints (noise or air safety zones, areas adjacent to the post, conservation buffers) to a designated “receiving area” that does not have site limitations. This transaction takes place voluntarily in the free



market. The owner of the constrained land sells the development credits established under zoning to a buyer who then can develop additional density on another property based on the number of credits purchased. Georgia law grants local governments the authority to adopt a TDR program though they are not as yet widely used within the state.

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.

General Regional Tools

These general communication and coordination tools are appropriate for any local government participating in the JLUS.

1. **Communication:** Under this communication option, participating jurisdictions would develop appropriate mechanisms to ensure that residents, developers, businesses, and local decision-makers have adequate information about Army operations, possible impacts on lands surrounding Fort Stewart/HAAF, 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.
2. **Coordinating Committee:** To continue the momentum created by the JLUS, the local jurisdictions, in collaboration with the Army, would establish a Fort Stewart/HAAF Regional Coordinating Committee, consisting of select members of the Technical and Policy Committees. The Regional Coordinating Committee would serve as a forum for a collaborative exchange of information and the review of major land use proposals both within the military and civilian communities.
3. **Comprehensive Plan:** Under this option, local governments would include specific language on JLUS coordination as part of any Comprehensive Plan update. The Comprehensive Plan establishes a firm legal basis for the implementation of compatibility actions. 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.

4. ***Memorandum of Understanding (MOU)***: The MOU is a "good faith" document that lays out procedures for communication among affected parties and formalizes collaboration among multiple stakeholders. All participating local governments and Fort Stewart/HAAF would sign a general MOU to be executed at the beginning stages of implementation. See the Appendix for a sample MOU.
5. ***Variable Message Boards***: Maintaining access on Highways 144 and 119, which cross through the post, is a particularly critical issue for people who live north, west and northwest of Fort Stewart. Closure of the roadways for safety purposes during training activities is infrequent and generally does not occur during peak hour traffic. Nonetheless, closure can require a lengthy diversion around the post perimeter. While the JLUS cannot influence the level of roadway access, the plan does recommend improved communication, particularly through the use of variable message boards at key driving decision points (City of Hinesville, City of Pembroke, I-95/Highway 144) to permit motorists to plan alternate routes during highway closures.

Army Tools

These tools are intended to minimize the noise, safety, and other impacts experienced by communities around Fort Stewart/HAAF, while protecting the viability of the military mission.

1. ***Conservation***: With this strategy, the Army would pursue conservation initiatives, such as the Army Compatible Use Buffer. The Army has the authority to partner with local governments and conservation organizations to assist in acquiring land or the development rights of land near military installations from a willing seller when the acquisition can protect both the environment and the military mission. Fort Stewart/HAAF has already begun to explore this option as a partner in the Coastal Georgia Private Lands Initiative.



2. **Communications:** This tool urges the Army to improve 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; establishing a PAO liaison to address noise and other issues in the community; and creating a brochure/poster on post mission and activities, operational impacts and mapped noise contours, and other compatibility issues.

As noted earlier, the Army participates in an outreach program called the Sustainable Range Program Outreach. Fort Stewart/HAAF also plans to host open house events before construction of the DMPTR.

3. **Coordination:** Along with local governments, the Army would participate in the Fort Stewart/HAAF JLUS Regional Coordinating Committee by organizing an internal committee on-post to review issues and establish one Point of Contact for coordination with the communities. The Army would then use the Regional Committee as a proactive forum to notify local governments of on-post actions that could affect the broader physical or economic environment of the installation.

With this strategy, the Army could develop a broad map of future functional areas, including training areas, inside the post boundary. The map would assist local communities in understanding the physical and economic impacts of foreseeable military missions, such as operational changes and unit assignments.

4. **MOU:** The Army would also sign a general MOU that documents future efforts at collaboration between local communities and the military. A specific provision of the MOU may include monitoring noise and conducting noise surveys in NZ II areas (off the installation) where incompatible development seems likely.
5. **Peak Noise Mapping:** Under this tool, the Army would explore the emerging use of peak noise data mapping to supplement the current method of day-night average noise modeling. Peak noise mapping can contribute to



a better understanding of the noise environment around the post because it more accurately reflects what people hear.

6. **Noise Mitigation:** Noise mitigation refers either to an operational change or a structural practice for reducing the noise produced by military activity for example by: muffling the noise at the source or interfering with the path that the noise travels as it goes off post (e.g. an intact forested buffer.)

There are currently engineering limitations to the amount of reduction, particularly for low frequency sound, that can be achieved at the source of the noise or along the path that noise travels. However, the Army continues to research mitigation methods.

7. **Variable Message Boards:** The Army should work with local governments and GDOT to explore use of variable message boards at key driving decision points in surrounding communities to alert motorists of planned closures of Highways 144 and 119 during training operations.
8. **Burn Procedures:** Smoke from controlled burns on post land can generate smoke that affects surrounding communities. While the burns are essential to maintain the open landscape desired by military trainers and to manage the longleaf ecosystem, the Army can reduce the impact on neighbors by providing advanced notification of controlled burns and information on standard burn procedures through e-mail, newspapers, web site postings, and published materials.

Areas of Concern

The purpose of this section is to create a framework for indicating where the area-specific tools described above can be effectively applied within the study area. The analysis relies on five maps:

- Figure 22 shows the 3,000-foot buffer
- Figure 23 shows the ACUB



- Figure 24 shows noise zones and airfield accident potential zones around Fort Stewart and HAAF
- Figure 25 is the Areas of Concern Map around Fort Stewart
- Figure 26 is the Areas of Concern Map around HAAF

The 3,000-foot buffer, ACUB and noise zone/air safety zones are described below.

3,000 foot buffer: The boundary shown on Figure 22 reflects Georgia State law, which as described earlier requires local planning agencies to review each proposed zoning decision involving land that is adjacent to or within 3,000 feet of any military installation or within 3,000 feet of a Clear Zone and Accident Potential Zones I and II.

The intent of showing the 3,000-foot buffer is to identify those areas that may raise compatibility issues with military operations due to the close physical proximity to the installation.

ACUB: The ACUB boundary as shown on Figure 23 represents an area of possible conservation interest identified by the partners of the Coastal Georgia Private Lands Initiative based upon factors such as adjacency to Fort Stewart/HAAF, environmental features, and impacts from Fort Stewart/HAAF operations.

The intent of showing the ACUB is to identify those areas that should be targeted for conservation-related strategies.

Noise Zones:

Figure 24 included areas around the post and airfield that are affected by noise from nearby military operations. The contours express noise exposure in decibels, calculated as a Day-Night Average Sound Level (DNL).

All of the noise zones surrounding Fort Stewart reflect the sound generated from the firing of large weapons on the post (defined as large caliber of 20mm or greater). The large weapons contours shown on Figure 24 represent a future noise environment of approximately 2007 in which a proposed Digital Multi-purpose



Training Range Complex (DMPTR) operates along with the existing range complex. Noise from smaller weapons is localized and, therefore, not shown on the map.

Of particular interest for JLUS planning purposes is the orange noise contour that crosses beyond Fort Stewart to the north and also slightly to the south of the installation boundary. This orange boundary represents Noise Zone II, an area in which the low frequency noise from large weapons firing can be high enough to raise compatibility issues with certain noise sensitive uses, such as housing, schools, and medical facilities. The blue line shown on Figure 24 reflects the Land Use Planning Zone (LUPZ), an area of lower noise exposure in which some sensitive uses can experience annoyance during especially active periods on the post.

Similarly, operations at Hunter Army Airfield (HAAF) produce noise that extends beyond the installation boundaries. The orange contour of Noise Zone II crosses both to the east and west of the airfield runways, indicating an area of high noise exposure that could trigger compatibility issues with some sensitive land uses. As with the post contours, the zones around HAAF depict the noise environment based on foreseeable military operations. The lesser noise exposure of the LUPZ shown in blue also encompasses land east and west of the runways. The noise produced at HAAF is A-weighted due to the higher frequency sound of aircraft (primarily helicopters).

Accident Potential Zones:

In addition to noise, Figure 24 also shows air safety impacts surrounding WAAF and HAAF. The three zones—the Clear Zone (CZ), Accident Potential Zone I (APZ I) and Accident Potential Zone II (APZ II)—identify areas around the airfield where an aircraft mishap would be most likely to occur and also assess the likely impact of any single accident. The risk is highest in the CZ immediately following the runway and then lessens in the APZ I and APZ II. In addition to indicating air safety risks for land uses, the zones depict areas where the building height, glare, or dust or smoke of adjacent activities could interfere with safe aircraft operations.

The APZ II of WAAF crosses south of the post near the City of Flemington. The APZ I and APZ II of HAAF go beyond the airfield boundary both to the east and the west.



To begin organizing the study area and to develop priorities for action, the Technical and Policy Committee members looked at a map that combined the 3,000-foot buffer, the ACUB, and the noise and accident potential zones. The purpose of this map was to understand the various operational, environmental and land use issues around the post and airfields and to find those critical and thus higher priority areas in which these issues converge.

The resulting maps are Figures 26 and 27, Areas of Concern. These maps break down the study area into a series of prioritized categories based on factors such as adjacency to the post, noise/vibration, possible interference with navigable air space, air safety risks, and conservation interest.

The tables at the end of this section then tailor the area-specific tools described earlier and pair the tools with a particular geographic area of concern.

Areas of Concern Categories:

Fort Stewart

The analysis identified the following areas of concern around the post in order of priority for action (see Figure 25).

Primary Protection: land inside the 3,000-foot buffer; inside the ACUB; and inside the Noise Zone II

Secondary Protection: land inside Noise Zone II

Influence Area: land inside a contiguous 3,000 foot buffer drawn around both the post and the accident potential zones of WAAF

ACUB: land inside the Army Compatible Use Buffer boundary

Stewart Land Use Planning Zone: land inside the LUPZ (includes Cities of Pembroke, Hinesville, Flemington)



Joint Land Use Study (JLUS) Boundary: study area established as part of the JLUS process

Hunter Army Airfield – West

The analysis identified the following areas of concern west of HAAF in order of priority for action (see Figure 26).

Primary Protection: land inside the accident potential zones associated with HAAF

Secondary Protection: land inside NZ II

Influence Area: land inside a contiguous 3,000 foot buffer drawn around both the airfield and its accident potential zones

ACUB: land inside the Army Compatible Use Buffer boundary

Transition Routes: land inside the helicopter flight transition corridors between HAAF and Fort Stewart

Joint Land Use Study (JLUS) Boundary: study area established as part of the JLUS process

Hunter Army Airfield – East

The analysis identified the following areas of concern east of HAAF in order of priority for action (see Figure 26).

Primary Protection: land inside the accident potential zones associated with HAAF

Secondary Protection: land inside NZ II

Influence Area: land inside a contiguous 3,000 foot buffer drawn around both the airfield and its accident potential zones

Joint Land Use Study (JLUS) Boundary: study area established as part of the JLUS process



The following tables identify specific tools that can be used in each of the identified areas of concern. The tools in the first column correspond to the area-specific tools described in the List of Land Use Compatibility Tools section. The areas of concern in the top row correspond to areas shown on Figures 25 and 26. A check (√) indicates that the tool is recommended for that area.

Table 7. Compatibility Tools for Fort Stewart Areas of Concern

Areas of Concern	Primary Protection	Secondary Protection	Influence	ACUB	LUPZ	JLUS
Tool						
Conservation	√	√	√	√		
General Land Use Guidelines	√ ¹	√ ¹	√ ²			
Attenuation	√	√				
Disclosure	√ ⁴	√ ⁴	√ ⁴	√ ⁵	√ ⁵	√ ⁵
Infrastructure	√	√	√			
Coordination	√	√	√	√	√	
Air Safety Land Use Guidelines						
Clustering/Transfer ³						

Notes:

1. General land use guidelines for land inside the Primary Protection or Secondary Protection Area around Fort Stewart recommend a very low density/rural residential pattern of no more than 1 dwelling unit per 5 acres. In particular, the priority of the JLUS is to protect the Primary Protection zone from the encroachment of denser, noise-sensitive land uses. Cell towers and other tall structures proposed for property within the Primary and Secondary Protection Zones of Fort Stewart/HAAF should also be sited so as not to interfere with safe air space operations.
2. General land use guidelines for land inside the Influence Zone recommend a low density residential pattern, possibly incorporating a clustered design to minimize the number of dwelling units exposed to safety risks. Development in this area should also be thoroughly reviewed for building height, ambient glare or other impacts that could interfere with safe air space use at WAAF.
3. Currently, transfer of development rights (TDR) does not seem to be a feasible tool for the areas around Fort Stewart because sufficient density is available through the regular rezoning process. As the region continues to grow, however, a TDR program may become a viable land use management option.



4. More specific disclosure recommended for property within the protection or influence zones of the installation
5. More general disclosure for areas beyond the protection or influence zones of the installation

Table 8. Compatibility Tools for Hunter Army Airfield West Areas of Concern

Area	Primary Protection	Secondary Protection	Influence	ACUB	Transition Corridors	JLUS
Tool						
Conservation	√	√	√	√		
General Land Use Guidelines	√ ¹	√ ¹	√ ²			
Attenuation	√	√				
Disclosure	√ ⁴	√ ⁴	√ ⁴	√ ⁵	√ ⁵	√ ⁵
Infrastructure	√	√	√			
Coordination	√	√	√	√	√	
Clustering/Transfer	√	√	√	√		

Notes:

1. Air safety land use guidelines for land west of HAAF and inside accident potential zones recommend no new residential development and no land uses that have a tendency to concentrate people i.e. retail, restaurants, churches. Development in this area should also be thoroughly reviewed for building height, ambient glare or other impacts that could interfere with safe air space use at HAAF. Cell towers and other tall structures proposed for property in the vicinity of Fort Stewart/HAAF should be sited so as not to interfere with safe air space operations.
2. General land use guidelines for the Influence Area west of HAAF suggest a low density residential pattern possibly incorporating a clustered design to minimize the number of dwelling units in proximity to the airfield.
3. Air safety land use guidelines for land inside the transition corridors should require a thorough review for building height, ambient glare or other impacts that could interfere with the safe navigation of helicopters flying between HAAF and Fort Stewart.
4. More specific disclosure recommended for property within the protection or influence zones of the installation
5. More general disclosure for areas beyond the protection or influence zones of the installation



Table 9. Compatibility Tools for Hunter Army Airfield East Areas of Concern

Area	Primary Protection	Secondary Protection	ACUB	JLUS
Tool				
Conservation ³				
General Land Use Guidelines	√ ¹	√ ¹	√ ²	
Attenuation	√	√		
Disclosure	√ ⁴	√ ⁴	√ ⁵	√ ⁵
Infrastructure ³				
Coordination	√	√	√	
Clustering/Transfer ³				

Notes:

1. Given the developed land use context east of HAAF, air safety land use guidelines in the Primary and Secondary Protection Areas recommend policies to discourage redevelopment that increases residential density above current levels. Cell towers and other tall structures proposed for property in the vicinity of Fort Stewart/HAAF should be sited so as not to interfere with safe air space operations.
2. General land use guidelines in the Influence Area east of HAAF Areas recommend policies to discourage redevelopment that increases residential density above current levels.
3. Given the developed land use context east of HAAF, it is assumed that opportunities to manage growth through conservation, infrastructure planning and clustering or transfer of development rights are significantly limited.
4. More specific disclosure recommended for property within the protection or influence zones of the installation
5. More general disclosure for areas beyond the protection or influence zones of the installation

Receipt of the final JLUS document is not the end of the planning process for the Fort Stewart-HAAF/coastal Georgia community. This document identifies possible compatibility tools that can be adopted by local communities and the installation.

As a first step toward achieving collaborative planning, this Implementation Section identifies all compatibility options described earlier in the report and identifies specific action steps and parties.

Proposed Tools	Action Steps	Implementation Entity
Purchase of Conservation Easements or Development Rights (PDRs)	Research potential funding sources/partnerships on a regional and state-wide basis and explore opportunities with the Georgia Land Conservation Trust Fund.	Army, Federal, State of Georgia, Local Jurisdictions, and Non-Profit Conservation Organizations
General Land Use Guidelines	Use comprehensive plan policy and zoning to encourage or require activities (industry, retail, recreation, agriculture, very low density/rural residential) that maintain compatibility with post operations in designated areas of concern.	Local Jurisdictions
Require indoor noise reduction measures.	Work with building industry to develop appropriate standards and incorporate into existing ordinances with the approval of local elected officials. Also require building codes and code enforcement mechanisms.	Local Jurisdictions and Building Industry
Disclosure of possible impacts as part of a real estate transaction.	Work with real estate and building industry to develop and implement language for inclusion.	Local Jurisdiction and Real Estate-Builders Representatives.

Proposed Tools	Action Steps	Implementation Entity
Coordinate the Capital Improvement Plan with Areas of Concern Map	Incorporate land use compatibility language into plans for infrastructure extensions and improvements.	Local Jurisdictions
Create a Fort Stewart/HAAF JLUS Regional Coordinating Committee	Select representatives from the Technical and Policy Committees to continue collaboration on issues. Should also include members of the development and business community, conservation interests, and landowners.	Local Jurisdictions and Army
Encourage use of current PUD zoning or new cluster/conservation zoning techniques.	Implementation by Local Planning and Zoning Staff.	Local Jurisdictions
Improve local government communications	Establish permanent web site link and integrate property appraiser's database when feasible. Publish awareness materials. Also work with local business organizations to publicize the economic relationship of the military in the region.	Local Jurisdictions and Business Organizations
Proposed Tools	Action Steps	Implementation Entity
Sign a Memorandum of Understanding	General MOU to be executed at the beginning stages of implementation.	Army and All Participating Local Jurisdictions.

Include JLUS implementation and land use coordination in Comprehensive Plan.	Include new language as part of updates of existing plans.	Local Jurisdictions
Establish Variable Message Boards	Post variable message boards at key driving decision points (City of Hinesville, City of Pembroke, I-95/Highway 144) to alert motorists of closure of Highways 144 and 119.	Army, GDOT, Local Jurisdictions
Improve Army communications	Publish planned training schedules and operational guidelines; establish a PAO liaison to address noise and other issues in the community; create brochure/poster on post mission and activities, operational impacts and mapped noise contours, and other compatibility issues; participate in Sustainable Range Program, and conduct open house events.	Army
Proposed Tools	Action Steps	Implementation Entity
Improve Army coordination	Develop a broad map of future functional areas, including training areas, inside the post boundary.	Army

Noise Mapping	Explore the emerging use of peak noise data mapping to supplement the current method of day-night average noise modeling.	Army
Burn Procedures	Provide advanced notification of controlled burns and information on standard burn procedures through e-mail, newspapers, web site postings, and published materials.	Army

Appendices

List of Acronyms

ACUB	Army Compatible Use Buffer
APZ	Accident Potential Zone
CGPLI	Coastal Georgia Private Lands Initiative
CZ	Clear Zone
dB	Decibels
dBA	A-weighted decibels
dBc	C-weighted decibels
DNL	Day-night sound level
DMPRC	Digital Multi-purpose Range Complex
DMPTR	Digital Multi-purpose Training Range
DU	Dwelling Unit
FAA	Federal Aviation Administration
FICUN	Federal Interagency Committee on Urban Noise
HAAF	Hunter Army Airfield
JLUS	Joint Land Use Study
LUPZ	Land Use Planning Zone
MOU	Memorandum of Understanding
NZ	Noise Zone
PAO	Public Affairs Office
TDR	Transfer of Development Rights
WAAF	Wright Army Airfield

Glossary

A-weighting (dBA) – A measure of sound that depicts higher frequency noise caused by small arms firing, aircraft use, and vehicle operations.

Accident Potential Zone I (APZ I) [Class A Runway Accident] - An area just beyond the Clear Zones at each end of the runway. Less critical than the Clear Zone it still possesses significant potential for accidents. Land use compatibility guidelines allow a wide variety of industrial, manufacturing, transportation, communication, utilities, wholesale trade, open space, recreation and agricultural uses. Uses that concentrate people in small areas are not acceptable in APZ I.

Accident Potential Zone II (APZ II) [Class A Runway] - An area extending beyond APZ I. This area is less critical than APZ I but still possesses potential for accidents. Acceptable land uses include those in APZ I, as well as low density, single family residences. Also acceptable are personal and business services and commercial retail trade uses of low intensity or scale of operation. High-density functions such as multi-story buildings, places of assembly (e.g., theaters, schools, churches, and restaurants) and high-density office uses are not considered appropriate.

Army Compatible Use Buffer (ACUB) - A new program allows military installations to provide funds to a partner who, in turn, would purchase title or conservation easements on tracts of land that surround the installation to buffer the installation from further development. Partners may include states, cities and counties as well as not-for-profit, non-governmental conservation organizations.

C-weighting (dBC) – a measure of sound that shows the low frequency noise and vibration associated with the firing of larger weapons systems.

Clear Zone (CZ) [Class A Runway] - An area 1,000 feet wide by 3,000 feet long located at the immediate end of the runway. The accident potential in this area is so high that no building is allowed.

Day-Night Average Sound Level (DNL) - The 24-hour average frequency-weighted sound level, in decibels, from midnight to midnight, obtained after addition of 10 decibels to sound levels in the night from midnight up to 7 a.m. and from 10 p.m. to midnight (0000 up to 0700 and 2200 up to 2400 hours).

Decibels (dB) - The decibel is a logarithmic unit of measure of sound pressure.

Land Use Planning Zone. The noise contours, 65 ADNL and 62CDNL, represent an annual average that separates the Noise Zone II, which has compatibility issues, from the fully compatible NZ I. Since the noise environment at the installation varies daily and seasonally, the Land Use Planning Zone (LUPZ) contour more broadly encompasses off-post lands, where on particularly active days, noise and the resulting community annoyance can approach levels typically associated with NZ II. The LUPZ, thus, gives the installation more flexibility for performing its mission and better reflects actual noise conditions during a period of heightened activity.

Noise Zone I. Noise Zone I (NZ I) includes areas around a noise source in which the DNL is less than 65 dBA and less than 62 dBC. Since the noise exposure in this zone is low enough that it does not trigger compatibility with sensitive uses, maps of the noise environment do not show NZ I contours.

Noise Zone II. Noise Zone II (NZ II) consists of an area where the A-weighted DNL is between 65 and 75 decibels and the C-weighted DNL is between 62 and 70 decibels. Guidance deems noise exposure within this area to be significant and recommends limiting use of land to non-sensitive activities such as industry, manufacturing, transportation, and agriculture. However, if the community determines that land in NZ II areas must be used for residential purposes, guidance suggests that the design and

construction of the buildings incorporate noise level reduction (NLR) features to minimize the annoyance experienced by residents.

Noise Zone III. Noise Zone III (NZ III) consists of the immediate areas around the source of the noise in which the A-weighted DNL (ADNL) is more than 75 decibels, and the C-weighted DNL (CDNL) exceeds 70 decibels. Guidance indicates that noise in this zone is severe enough to cause conflicts with almost all activities, particularly sensitive land uses, such as housing, schools, medical facilities, and places of worship.

DoD COMPATIBLE LAND USE GUIDELINES FOR CLEAR ZONES AND ACCIDENT POTENTIAL ZONES (APZ). (U.S. Army 1981)

LAND USE	CLEAR ZONE	APZ I	APZ II
A. RESIDENTIAL			
Single Family Unit	No	No	Yes ²
2-4 Family Units	No	No	No
Multifamily Dwellings (Apartments)	No	No	No
Group Quarters	No	No	No
Residential Hotels	No	No	No
Mobile Home Parks or Courts	No	No	No
Other Residential	No	No	No
B. INDUSTRIAL & MANUFACTURING³			
Food and Kindred Products	No	No	Yes
Apparel	No	No	No
Lumber and Wood Products	No	Yes	Yes
Furniture and Fixtures	No	Yes	Yes
Printing, Publishing	No	Yes	Yes
Miscellaneous Manufacturing	No	Yes	Yes
C. TRANSPORTATION, COMMUNICATIONS & UTILITIES⁴			
Railroad, Rapid Rail Transit (on-grade)	No	Yes ⁴	Yes
Highway and Street Rights-of-Way	Yes ⁵	Yes	Yes
Auto Parking	No	Yes	Yes
Communications	Yes ⁵	Yes	Yes
Utilities	Yes ⁵	Yes ⁴	Yes
Other Transportation, Communications and Utilities	Yes ⁵	Yes	Yes
D. COMMERCIAL & RETAIL TRADE			
Wholesale Trade	No	Yes	Yes
Building Materials (Retail)	No	Yes	Yes
General Merchandise (Retail)	No	No	Yes
Food (Retail)	No	No	Yes
Automotive, Marine, and Aviation	No	Yes	Yes
Apparel and Accessories (Retail)	No	No	Yes
Furniture, Home Furnishings (Retail)	No	No	Yes
Eating and Drinking Facilities	No	No	No
Other Retail Trade	No	No	Yes
E. PERSONAL & BUSINESS SERVICES⁶			
Finance, Insurance, and Real Estate	No	No	Yes
Personal Services	No	No	Yes
Business Services	No	No	Yes
Repair Services	No	Yes	Yes
Professional Services	No	No	Yes
Contract Construction Services	No	Yes	Yes
Indoor Recreation Services	No	No	Yes
Other Services	No	No	Yes
F. PUBLIC AND QUASI-PUBLIC SERVICES			
Government Services	No	No	Yes ⁶
Educational Services	No	No	No
Cultural Activities	No	No	No
Medical and Other Health Services	No	No	No
Cemeteries	No	Yes ⁷	Yes ⁷

Non-profit Organizations including Churches	No	No	No
Other Public and Quasi-Public Services	No	No	Yes
G. OUTDOOR RECREATION			
Playgrounds and Neighborhood Parks	No	No	Yes
Community and Regional Parks	No	Yes ⁸	Yes ⁸
Nature Exhibits	No	Yes	Yes
Spectator Sports Including Arenas	No	No	No
Golf Courses ⁹ , Riding Stables ¹⁰	No	Yes	Yes
Water Based Recreational Areas	No	Yes	Yes
Resort and Group Camps	No	No	No
Entertainment Assembly Areas	No	No	No
Other Outdoor Recreation	No	Yes ⁸	Yes
H. RESOURCE PRODUCTION & EXTRACTION& OPEN LAND			
Agriculture ¹¹	Yes	Yes	Yes
Livestock Farming, Animal Breeding ¹²	No	Yes	Yes
Forestry Activities	No	Yes	Yes
Fishing Activities and Related Services ¹³	No ¹⁴	Yes ¹³	Yes
Mining Activities	No	Yes	Yes
Permanent Open Space	Yes	Yes	Yes
Water Areas ¹³	Yes	Yes	Yes

Footnotes:

- 1 A "Yes" or "No" designation for compatible land use is to be used only for gross comparison. Within each, uses exist where further definition may be needed as to whether it is clear or usually acceptable/unacceptable owing to variations in densities of people and structures. For heliports and stagefields, the takeoff safety zone is equivalent to the clear zone and the approach-departure zone is equivalent to APZ I for these land use guidelines.
- 2 Suggested maximum density 1-2 dwelling units per acre, possibly increased under a Planned Unit Development where maximum lot coverage is less than 20 percent.
- 3 Factors to be considered: Labor intensity, structural coverage, explosive characteristics, and air pollution.
- 4 No passenger terminals and no major above ground transmission lines in APZ I.
- 5 Not permitted in graded area.
- 6 Low intensity office uses only. Meeting places, auditoriums, etc., not recommended.
- 7 Excludes chapels.
- 8 Facilities must be low intensity.
- 9 Clubhouse not recommended.
- 10 Concentrated rings with large classes not recommended.
- 11 Includes livestock grazing but excludes feedlots and intensive animal husbandry.
- 12 Includes feedlots and intensive animal husbandry.
- 13 Includes hunting and fishing.
- 14 Controlled hunting and fishing may be permitted for the purpose of wildlife control.

GUIDELINES FOR CONSIDERING NOISE IN LAND USE PLANNING AND CONTROL. (FICUN 1980)

	NZ I		NZ II		NZ III		
	0-55	55-65	65-70	70-75	75-80	80-85	85+
RESIDENTIAL							
Household Units	Yes	Yes*	25 ¹	30 ¹	No	No	No
Group Quarters	Yes	Yes*	25 ¹	30 ¹	No	No	No
Residential Hotels	Yes	Yes*	25 ¹	30 ¹	No	No	No
Manufactured Housing	Yes	Yes*	No	No	No	No	No
Other Residential	Yes	Yes*	25 ¹	30 ¹	No	No	No
MANUFACTURING							
Food Products	Yes	Yes	Yes	Yes ²	Yes ³	Yes ⁴	No
Textile Mill Products	Yes	Yes	Yes	Yes ²	Yes ³	Yes ⁴	No
Apparel	Yes	Yes	Yes	Yes ²	Yes ³	Yes ⁴	No
Wood Products	Yes	Yes	Yes	Yes ²	Yes ³	Yes ⁴	No
Furniture	Yes	Yes	Yes	Yes ²	Yes ³	Yes ⁴	No
Paper	Yes	Yes	Yes	Yes ²	Yes ³	Yes ⁴	No
Printing	Yes	Yes	Yes	Yes ²	Yes ³	Yes ⁴	No
Manufacturing	Yes	Yes	Yes	Yes ²	Yes ³	Yes ⁴	No
TRANSPORT, COMMS & UTIL							
Railroad	Yes	Yes	Yes	Yes ²	Yes ³	Yes ⁴	Yes ⁴
Motor Vehicle	Yes	Yes	Yes	Yes ²	Yes ³	Yes ⁴	Yes ⁴
Aircraft	Yes	Yes	Yes	Yes ²	Yes ³	Yes ⁴	Yes ⁴
Marine Craft	Yes	Yes	Yes	Yes ²	Yes ³	Yes ⁴	Yes ⁴
Highway & Street	Yes	Yes	Yes	Yes ²	Yes ³	Yes ⁴	Yes ⁴
Parking	Yes	Yes	Yes	Yes ²	Yes ³	Yes ⁴	No
Communications	Yes	Yes	Yes	25 ⁵	30 ⁵	No	No
Utilities	Yes	Yes	Yes	Yes ²	Yes ³	Yes ⁴	Yes ⁴
Other T, C & U	Yes	Yes	Yes	25 ⁵	30 ⁵	No	No
TRADE							
Wholesale Trade	Yes	Yes	Yes	Yes ²	Yes ³	Yes ⁴	No
Retail - Building	Yes	Yes	Yes	Yes ²	Yes ³	Yes ⁴	No
Retail - General	Yes	Yes	Yes	25	30	No	No
Retail - Food	Yes	Yes	Yes	25	30	No	No
Retail - Auto	Yes	Yes	Yes	25	30	No	No
Retail - Apparel	Yes	Yes	Yes	25	30	No	No
Retail - Furniture	Yes	Yes	Yes	25	30	No	No
Retail - Eating	Yes	Yes	Yes	25	30	No	No
Other Retail Trade	Yes	Yes	Yes	25	30	No	No
SERVICES							
Finance, Insurance	Yes	Yes	Yes	25	30	No	No
Personal Services	Yes	Yes	Yes	25	30	No	No
Cemeteries ¹¹	Yes	Yes	Yes	Yes ²	Yes ³	Yes ⁴	Yes ⁶
Repair Services	Yes	Yes	Yes	Yes ²	Yes ³	Yes ⁴	No
Profess Services	Yes	Yes	Yes	25	30	No	No
Hospitals, Nursing	Yes	Yes*	25*	30*	No	No	No
Other Medical Facilities	Yes	Yes	Yes	25	30	No	No
Contract Construction	Yes	Yes	Yes	25	30	No	No
Government Services	Yes	Yes*	Yes*	25*	30*	No	No
Educational Services	Yes	Yes*	25*	30*	No	No	No
Misc Services	Yes	Yes	Yes	25	30	No	No

CULTURAL, ENTERTAINMENT & REC							
Churches	Yes	Yes [*]	25 [*]	30 [*]	No	No	No
Nature Exhibits	Yes	Yes [*]	Yes [*]	No	No	No	No
Public Assembly	Yes	Yes	Yes	No	No	No	No
Auditoriums	Yes	Yes	25	30	No	No	No
Amphitheaters	Yes	Yes [*]	No	No	No	No	No
Outdoor Sports	Yes	Yes	Yes ⁷	Yes ⁷	No	No	No
Amusements	Yes	Yes	Yes	Yes	No	No	No
Recreational	Yes	Yes [*]	Yes [*]	25 [*]	30 [*]	No	No
Resorts	Yes	Yes [*]	Yes [*]	Yes [*]	No	No	No
Parks	Yes	Yes [*]	Yes [*]	Yes [*]	No	No	No
Other	Yes	Yes [*]	Yes [*]	Yes [*]	No	No	No
RESOURCE PRODUCT							
Agriculture	Yes	Yes	Yes ⁸	Yes ⁹	Yes ¹⁰	Yes ¹⁰	Yes ¹⁰
Livestock	Yes	Yes	Yes ⁸	Yes ⁹	No	No	No
Forestry	Yes	Yes	Yes ⁸	Yes ⁹	Yes ¹⁰	Yes ¹⁰	Yes ¹⁰
Fishing	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mining	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other Resource	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Legend:

Yes	Land use and related structures compatible without restrictions.
No	Land use and related structures are not compatible and should be prohibited.
ADNL	A-weighted day-night sound level
NZ	Noise Zone
Yes ^x	(Yes with restrictions) Land use and related structures generally compatible; see footnotes.
25, 30, 35	Land use and related structures generally compatible; measures to achieve noise level reduction (NLR) of 25, 30 or 35 must be incorporated into design and construction of structure.
25 [*] , 30 [*] , 35 [*]	Land use generally compatible with NLR; however, measures to achieve an overall NLR do not necessarily solve noise difficulties; additional evaluation is warranted.
NLR	Noise level reduction (outdoor to indoor) to be achieved through incorporation of noise attenuation into the design and construction of the structure.

Footnotes:

- * The designation of these uses as "compatible" in this zone reflects individual Federal agencies' consideration of general cost and feasibility factors as well as past community experiences and program objectives. Localities, when evaluating the application of these guidelines to specific situations, may have different concerns or goals to consider.
- ¹
- (a) Although local conditions may require residential use, it is discouraged in 65-70 ADNL and strongly discouraged in 70-75 ADNL. The absence of viable alternative development options should be determined and an evaluation indicating that a demonstrated community need for residential use would not be met if development were prohibited in these zones should be conducted prior to approvals.
- (b) Where the community determines that residential uses must be allowed, measures to achieve outdoor to indoor NLR of at least 25 dB (65-70 ADNL) and 30 dB (70-75 ADNL) should be incorporated into building codes and be considered in individual approvals. Normal construction can be expected to provide a NLR of 20 dB, thus the reduction requirements are often stated as 5, 10, or 15 dB over standard construction and normally assume mechanical ventilation and closed windows year round. Additional consideration should be given to modifying NLR levels based on peak noise levels.
- (c) NLR criteria will not eliminate outdoor noise problems. However, building location and site planning, design, and use of berms and barriers can help mitigate outdoor noise exposure particularly from ground level transportation sources.

Measures that reduce noise at a site should be used wherever practical in preference to measures that only protect interior spaces.

2 Measures to achieve NLR of 25 must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.

3 Measures to achieve NLR of 30 must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.

4 Measures to achieve NLR of 35 must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.

5 If noise-sensitive, use indicated NLR; if not, use is compatible.

6 No buildings.

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

8 Residential buildings require a NLR of 25.

9 Residential buildings require a NLR of 30.

10 Residential buildings not permitted.

11 In areas with ADNL greater than 80, land use not recommended, but if community decides use is necessary, hearing protection devices should be worn by personnel.

Sample Real Estate Disclosure (Inside 3,000 feet)

AREA OF MILITARY IMPACT REAL ESTATE DISCLOSURE FORM

Property at the following location is situated within 3,000 feet of a military installation or within a designated noise/air safety zone of Fort Stewart/Hunter Army Airfield. The subject property may therefore be exposed to periodic low-level military aircraft over-flights, large artillery noise, small arms noise, and impacts associated with other such military training activities.

Parcel #: _____ Deed Book # _____ Page # _____

Address: _____

I, _____, (owner of the subject property) hereby certify that I have informed _____ (prospective purchaser/lessee/renter) that the subject property is located within 3,000 feet of a military installation or within a designated noise/air safety zone of Fort Stewart/Hunter Army Airfield and may therefore be exposed to periodic low-level military aircraft over-flights, artillery/small arms noise, other such military training activities.

Owner/ Date

I, _____, (prospective purchaser/lessee/renter of the subject property) hereby certify that I have been informed by _____ (owner) that the subject property is located within 3,000 feet of a military installation or within a designated noise/air safety zone of Fort Stewart/Hunter Army Airfield and may therefore be exposed to periodic low-level military aircraft over-flights, artillery/small arms noise, other such impacts of military training activities.

Purchaser/Lessee/Renter Date

Signed before me on this _____ day of _____, 20____, in the
County of _____, Georgia.

_____, Notary Public, State of Georgia.

My Commission Expires on _____. (SEAL)

Sample Real Estate Disclosure (general disclosure)

AREA OF MILITARY INFLUENCE REAL ESTATE DISCLOSURE FORM

Property at the following location is situated in the vicinity of Fort Stewart/Hunter Army Airfield. The subject property therefore may currently or in the future be exposed to periodic low-level military aircraft over-flights, large artillery noise, small arms noise, and impacts associated with other such military training activities.

Parcel #: _____ Deed Book # _____ Page # _____

Address: _____

I, _____, (owner of the subject property) hereby certify that I have informed _____ (prospective purchaser/lessee/renter) that the subject property is located in the vicinity of Fort Stewart/Hunter Army Airfield and may therefore currently or in the future be exposed to periodic low-level military aircraft over-flights, artillery/small arms noise, other such military training activities.

Owner/ Date

I, _____, (prospective purchaser/lessee/renter of the subject property) hereby certify that I have been informed by _____ (owner) that the subject property is located in the vicinity of Fort Stewart/Hunter Army Airfield and may therefore be currently or in the future exposed to periodic low-level military aircraft over-flights, artillery/small arms noise, other such impacts of military training activities.

Purchaser/Lessee/Renter Date

Signed before me on this _____ day of _____, 20____, in the
County of _____, Georgia.

_____, Notary Public, State of Georgia.

My Commission Expires on _____. (SEAL)

Sample Memorandum of Understanding

MEMORANDUM OF UNDERSTANDING

Between Fort Stewart/Hunter Army Airfield and

The Counties of _____ and

The Cities of _____

This Memorandum of Understanding between Fort Stewart/HAAF, the Counties of _____, and the Cities of _____, is enacted to establish a mutually beneficial process that will ensure timely and consistent notification and cooperation between the parties on projects, policies, and activities. These parties have a mutual interest in the cooperative evaluation, review, and coordination of local plans, programs, and projects in the Counties of _____, the Cities of _____, and on Fort Stewart or Hunter Army Airfield.

The Cities of _____ and the Counties of _____ agree to:

1. Submit information to Fort Stewart/HAAF on plans, programs, actions, and projects that may affect Fort Stewart/HAAF. This may include, but not be limited to the following:
 - Development proposals
 - Transportation improvements and plans
 - Sanitary waste facilities//any infrastructure necessary to support development
 - Open space and recreation
 - Public works projects
 - Land use plans and ordinances
 - Rezoning and variances
2. Submit to Fort Stewart/HAAF for review and comment, project notification, policies, plans, reports, studies and similar information on development, infrastructure and environmental activities within proximity of Fort Stewart/HAAF as defined by _____.

3. Consider Army comments as part of local responses or reports.
4. Include Fort Stewart/HAAF in the distribution of meeting agendas for, but not limited to:
 - City Council or County Commission Meetings
 - Planning Commission Meetings
 - Zoning Boards of Adjustment
 - Review Board
 - Transportation Studies

Fort Stewart/HAAF agrees to:

1. Submit information to City and County representatives on plans, programs, actions, and projects which may affect the city or county. These may include, but not be limited to, the following:
 - Installation Master Plan
 - Installation Compatible Use Zone Studies
 - Noise Management Studies
 - Changes in existing installation use that may change off-post impacts, such as noise
 - Appropriate data on troop strength and activities for local plans, programs and projects
2. Submit to City and County representatives for review and comment, project notification, policies, plans, reports, studies and similar information on development, infrastructure and environmental activities at Fort Stewart or HAAF.

This agreement will remain in effect until terminated by any of the parties.

Amendments to this memorandum may be made by mutual agreement of all the parties. Review process details and appropriate forms may be developed to facilitate uniform and efficient exchanges of comments.

This understanding will not be construed to obligate the U.S. Army, the Cities of _____, the Counties of _____ to violate existing or future laws or regulations.

This agreement is approved by:

County

City

Fort Stewart/Hunter AAF

State of Georgia Land Conservation Program Request

MAYOR
Thomas J. Ratcliffe, Jr.

CITY MANAGER
Billy Edwards

CITY CLERK
Sarah Lumpkin

CITY ATTORNEY
Jeffery L. Arnold

City of Hinesville

115 East M.L. King, Jr. Drive

Hinesville, Georgia 31313-3699

Phone - (912) 876-3564

Fax - (912) 369-2416

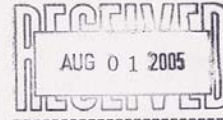
MAYOR PRO TEM
David Anderson, Sr.

COUNCIL MEMBERS

Charles Frasier
Kenneth Shaw
Jack Shuman
Steve Troha

July 18, 2005

Jennifer M. Spivey
Land Conservation Program Manager
Georgia Environmental Facilities Authority
100 Peachtree St., NW
Suite 2090
Atlanta, GA 30303-1911



Dear Ms. Spivey:

On behalf of the Fort Stewart/Hunter Army Airfield Joint Land Use Study (JLUS) Policy Committee, I urge you to consider the lands adjacent to Fort Stewart and Hunter Army Airfield for their conservation value to the region. Where practicable, State conservation funds would be used along with US Federal funds provided through Army Compatible Use Buffer (ACUB) program to acquire lands or easements in the ACUB area around Fort Stewart and Hunter Army Airfield as identified in the JLUS and shown on the attached map.

It is our contention that a responsible use of much of the land immediately adjacent to Ft. Stewart and Hunter Army Airfield is conservation. The conservation of this land fits exceptionally well with the intentions of the Georgia Land Conservation Program in that significant lands surrounding these installations are environmentally sensitive areas including wetlands and critical wildlife habitat.

Fort Stewart has been recognized by the Nature Conservancy and other organizations for its wealth of biodiversity, including the state's largest populations of endangered red-cockaded woodpeckers, eastern indigo snakes, and flatwoods salamanders. The Army is to be commended for its stewardship of the natural resources entrusted to its care, but a long term program is clearly needed to ensure the sustainability of the installation's training mission and the region's natural resources. Conservation of lands adjacent to the installation will protect both the environment and the military mission.

Your attention and consideration will be appreciated. We would be pleased to present this matter in greater detail in a face to face meeting at your convenience. Please advise.

Sincerely,

Mayor Thomas J. Ratcliffe, Jr.
Chairman, Ft. Stewart/Hunter AAF JLUS Policy Committee

TJRjr/ss