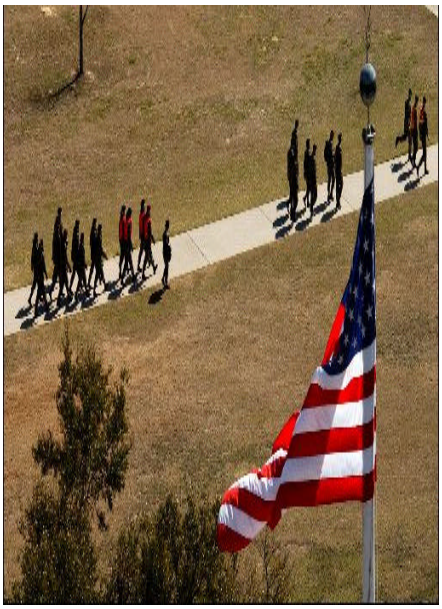
Partnership for Growth



Fort Gordon Joint Land Use Study

August 2005

Prepared by:

CSRA Regional Development Center

For:

Fort Gordon
Augusta-Richmond County
Columbia County
Jefferson County
McDuffie County

This study was prepared under contract with participating communities of the Central Savannah River Area region with financial support from the Office of Economic Adjustment, Department of Defense. The contents reflect the views of the CSRA Regional Development Center and do not necessarily reflect the views of the Office of Economic Adjustment.

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Introduction

Fort Gordon has a long-standing presence in the Central Savannah River Area (CSRA) and the cities and counties around Fort Gordon have grown over the years, reinforcing the close relationship between military and civilian communities. The Fort is critical to the CSRA economy, generating thousands of jobs and billions of dollars in economic activity and tax revenue. Similarly, Fort Gordon service members and civilian employees enjoy the region's great quality of life, benefiting from the amenities of large metropolitan areas but without the congestion and high cost of living. This interdependence, however, poses the challenge that is central to the Joint Land Use Study.

When originally built, most major military installations were located outside urban centers. However, the spin-off economic effects of post operations and the general trend toward growth unrelated to military installations in previously rural and semi-urban areas resulted in new land use challenges. In many cases, development in exiting cities and counties has expanded toward or engulfed installations. Increases in population and economic activity draw more people toward the noise and accident risk areas generated by military training.

As growth occurs, so too does the tension between land uses as segments of new populations are not economically dependent on the installation, and tend to be annoyed by the noise aspect of military training. Encroachment places pressure on installations to modify their operations and procedures, resulting in limitations on support training and for assigned units to maintain adequate level of readiness, possibly compromising the overall mission. Limitations on operational activities degrade installation capability to support essential training.

Beyond impacts on readiness, encroachment unnecessarily costs the Department of Defense (DOD) funds that can be used for other purposes. Numerous installations were recipients of funding to offset incompatible development. These considerations have not escaped defense officials, who have included such criteria in the 2005 Base Realignment and Closure process. When evaluating components of the total military value of a specific military installation, DOD assesses the surrounding local area to determine land use compatibility with regard to mission operations.

In order to prevent conflicts between military operations and civilian land use from reaching significant proportions, the Army has worked with the local communities to prevent incompatible land use and taken reasonable steps to protect communities from noise. In 1985, 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:

- To encourage cooperative land use planning between military installations and surrounding communities.
- To seek ways to reduce the operational impacts of military installations on adjacent lands.

The JLUS process encourages residents, local decision-makers, and installation representatives to study issues of compatibility in an open forum, balancing both civilian and military interests. The reasoning for participating in the project is that the combined resources of all entities are more effective than the separate efforts of each in resolving issues of mutual interest.

Mission

Fort Gordon, located in east-central Georgia, is the largest communications training facility in the Armed Forces, and is the focal point for the development of tactical communications and information systems. Fort Gordon's organization consists of the Command and Command Staff of the U.S. Army Signal Center; the U.S. Army Garrison charged with installation management; Medical and Intelligence units, and a growing National Guard presence.

Major Study Findings

The State of Georgia, local governments and Fort Gordon have a number of land use coordination mechanisms and compatibility tools in place to prevent encroachment.

State of Georgia

- Under state enabling legislation (Title 36, SB261, 2003 of the Official Code of Georgia Annotated), local governments abutting all military installations are required to coordinate with installations in considering the impact of zoning decisions on military operations. The law requires local governments solicit a written recommendation from a military base's commanding officer when there is a proposed change in zoning or special exception of property that is within 3,000 feet of the installation. This provides an opportunity for Fort Gordon to offer a recommendation regarding the proposed land use or zoning change and allows installation officials to explain whether or not the proposed change will have a negative impact on operations.
- The Georgia Department of Community Affairs administers the Developments of Regional Impact (DRI) law. DRI's establish procedures for intergovernmental review of large-scale projects, designed to improve communication between affected governments and to provide a means of assessing potential impacts of large-scale developments before conflicts arise.

Local Governments

- Comprehensive plan language explicitly promoting land use coordination with Fort Gordon. For example, one of the goals of the Richmond County comprehensive plan is to: "Assure that Fort Gordon remains open by developing new missions,

building more support in the metro area, and protecting the Fort from encroachment by conflicting land uses".

- Stated policies to guide targeted growth away from areas that interfere with Fort Gordon's training areas.
- Flexible zoning, such planned unit developments, which reduce post impacts through innovative cluster/site design.
- Providing Fort Gordon a direct role in local transportation planning. Fort Gordon's Garrison Commander is a voting member of the Augusta Regional Transportation Study (ARTS) Policy Committee and a Garrison representative is a voting member of the ARTS Technical Coordinating Committee.
- Local government planning and Fort Gordon staffs serve jointly on the Augusta Watershed Roundtable.
- Local government planning and Fort Gordon staffs serve jointly on the Augusta Air Quality Task Force sponsored by the Metro Augusta Chamber of Commerce. Other cooperative efforts related to air quality include the Fort's support of Augusta's participation in the Early Action Compact (EAC) related to ozone pollution. Fort Gordon representatives have also participated in EAC public meetings.
- Local government planning staffs serve jointly with Fort personnel on installation environmental planning committees. Recent examples include the Butler Creek Water Supply Watershed Management Plan (2000) and the Installation Environmental Noise Management Plan (2001).

Fort Gordon

- Strategic placement of ranges and other training facilities to minimize noise impacts, resulting in reduced noise effects off-post.
- Regularly publishes notices of live fire exercises in *The Signal.*
- Restricts certain types of training during certain times to limit noise exposure on nearby communities.
- Includes adjacent local government on its planning committees, ensuring coordination in planning efforts.

Land Use

The CSRA region is primarily rural with the exception of two larger urban population centers within Columbia and Richmond Counties. Generally, existing land uses and development patterns within the study area can be characterized as typical urban/suburban in pre-established cities with rural areas future away.

- Augusta-Richmond County has the most diverse land use patterns of all study area communities.
- Census data for the period 1990-2000 indicates that Columbia County captured approximately 90% of the study area's growth. The result has been increasingly urbanized areas concentrated in the Evans-Martinez area and in the City of Grovetown.

- Close to 60% of McDuffie County land use is agricultural and forestry, a rate that is far higher when excluding Thomson, the county seat and relatively urbanized area.
- Jefferson County is a largely rural community containing the least intensely developed land within the study area. According to the Jefferson County Comprehensive Plan, just over 88% percent of the county's total acres are devoted to agricultural and forestry uses.

Land uses within 1-mile of Fort Gordon vary from semi-urban to rural:

- In western Richmond County, land use adjacent to Fort Gordon follows a pattern of more densely developed areas forming a crescent from the northeast and circling around the installation perimeter to Tobacco Road. From the Columbia County line around to Tobacco Road the pattern of land use closest to Fort Gordon is single-family residential with some mobile home development. Additionally, there is some multi-family development scattered throughout this area and business/commercial uses along the major thoroughfares such as Gordon Highway and Deans Bridge Road.
- The U.S. 1 corridor is lined with businesses north of Gate 5, and there is a mixture of rural residences, businesses, and undeveloped land south of Gate 1. The other section of U.S. 1 is a parallel corridor to the southeast that is predominantly agricultural in character.
- The pattern of land use in the area of Columbia County closest to Fort Gordon is mixed. The areas further away from Evans-Martinez are undeveloped and form the largest portion of land use adjacent to the installation. However, the areas closest to Grovetown contain low-density suburban-type single-family residential uses.
- Land use adjacent to Fort Gordon in Jefferson and McDuffie Counties is agricultural in character and extends from the Richmond and Columbia County lines deeply into those counties.

Development Intensity

- There is no record of any building permits issued within a 1-mile radius of Fort Gordon in Columbia, Jefferson and McDuffie Counties. In Richmond County, it is estimated that only a handful of the over 3,000 permits issued were to the north and east of the installation since 2000.
- The U.S. Bureau of the Census defines urban areas according to a number of variables, including population, densities and land use. In 2000, approximately 16.6% of the acreage within a 1-mile radius of Fort Gordon was classified as urban, mostly in Richmond County, representing a 4.1% increase from 1990.
- In 2000, approximately 23,167 residents were located within a 1-mile radius of Fort Gordon, an increase of 55% since 1990. Approximately 80% of these residents live within Richmond County. The overwhelming majority of population residing near Fort Gordon is located in areas of Augusta-Richmond and Columbia Counties considered compatible with the Fort's training environment.

- Approximately 4,105 people or 4.6% of the Columbia County population lies within 1-mile of Fort Gordon, an increase of 80% since 1990. Most of the growth has occurred in and around the Grovetown area.
- Combined, about 200 people or less than 1% of the population in Jefferson and McDuffie Counties lie within 1-mile of Fort Gordon. In Jefferson County, there are fewer people residing near the installation than in 1990.

Noise Environment

The U.S. Army has developed a 3-step noise model to correspond with land use guidance for planning in and around installations. Guidance suggests that all land use are acceptable in Noise Zone I, some limitations be placed in NZ II and no residential and other sensitive development occur within NZ III.

- Approximately 2,287 people reside within NZ I, slightly over double the 1990 rate. All land uses within NZ I are considered compatible.
- Approximately 74 people reside within NZ II in Richmond and Jefferson Counties, a rate more of less in the line with 1990 figures. The prevalence of mining and agricultural operations has limited population growth within NZ II areas.
- No population resides within NZ III.
- Approximately 1,079 parcels or 12,508 acres lay within NZ I, representing approximately 1% of parcels and acreage in the study area. Affected lands range from 0% in Jefferson County to a slightly over 3% in Richmond County.
- Approximately 69 parcels or 3,803 acres lie within NZ II, representing less than 1% of parcels and acreage in the study area. Affected lands range from 0% in Columbia and Jefferson Counties to approximately 0.8% in Richmond County.

Growth and Development Potential

Based on local comprehensive plans, the following planning assumptions summarize anticipated future land use trends over the next 20 years.

1. Moderate to High Residential Growth
2. Moderate Commercial Growth
3. Moderate Industrial Growth
4. Declining Agricultural and Forestry
5. Moderate Parks, Recreation and Conservation Growth

In terms of the distribution of growth, local comprehensive plans contain numerous targeted growth areas, none of which lie within Fort Gordon's critical training areas or noise zones.

- Columbia County: Growth focused in compact areas to the west and around the Grovetown area.
- Jefferson County: Growth concentrated near the airport areas in Wrens and Louisville, 10 and 25 miles away from Fort Gordon.

- McDuffie County: Growth focused in the Thomson area just south of I-20.
- Richmond County: Growth focused in west and south-central Richmond County.

Further, local plans include the various recommendations to encourage:

- Commercial development on heavy arterial highways where commercial or institutional development is now established.
- Infill development and concentrate multi-family and high-density housing in commercial and transitional commercial/residential areas.

Projected growth rates as identified in local comprehensive plans do not raise compatibility issues with Fort Gordon:

- Columbia County will undergo substantial conversion from undeveloped to residential uses. The area to the northeast of Fort Gordon, around the Grovetown area, is poised to enjoy significant population growth through the next two decades.
- Lands in Jefferson and McDuffie Counties, to the south and southwest of Fort Gordon, are projected to remain primarily agricultural and forestry.
- The future land use map for Richmond County includes growth areas away from both Noise Zones I and II.

Other Determinants of Future Growth

Infrastructure

- Major roadways expansion project along the Fall Line Freeway (U.S. 1) should not result in encroachment if growth follows the pattern established in the Jefferson and Richmond County comprehensive plans.
- The Savannah River Parkway (U.S. 25) should encourage growth in areas at substantial distances from Fort Gordon.

Utilities

- Very limited utilities are provided in proximity to Fort Gordon. Water lines have been added along U.S. 1 north of Blythe but sewer lines have not been extended that far south. In Columbia County, there is concentrated utilities coverage in Grovetown while in McDuffie County, utilities have not been provided in proximity to Fort Gordon. A review of Capital Improvement Plans for utilities indicates no immediate plans to place utilities near Fort Gordon's training areas.

Zoning

- Zoning districts within the study area vary. Both Columbia and Jefferson Counties have zoned the areas closest to Fort Gordon as mixed agricultural and very low-density rural residential (R-A) because intensive land development in those areas is

not desired due to limited ability to provide public services and facilities. The minimum lot size in the R-A district is 2½ acres in Columbia County and 1 acre in Jefferson County and permitted uses are limited to residential and agricultural.

- In McDuffie County, the area around Fort Gordon is zoned low-density residential. Currently, minimum lot sizes are 1 acre but the county is in the process of updating the zoning ordinance and is considering 5-acre lot sizes.
- Most of the area around Fort Gordon in Richmond County, including within Noise Zone I and II, is zoned agricultural. Some low-density residential and commercial districts are located further north.

Environmental Constraints

- Numerous environmental constraints (floodplains, wetlands, soils) near Fort Gordon's training areas render the cost of development in those areas relatively costly given the availability of unconstrained lands elsewhere.

Recommended Action to Prevent Encroachment

JLUS Implementation Schedule	
Recommendation	**Timeline**
Local Governments	
1) Support the efforts of the Georgia Military Affairs Coordinating Committee (GMACC) and state legislation to protect Georgia military installations from encroachment.	Ongoing
2) Adopt noise and smoke disclosures in Noise Zone I and II and within a 1-mile radius of Fort Gordon as part of the rezoning process.	2005-2010
3) Guide development away from Noise Zone II. Consider Noise Zone II as a factor in capital improvement projects and during development review.	Ongoing
4) Promote and encourage new population growth and land development (especially planned unit development) in urban areas and areas already served by infrastructure and community facilities.	Ongoing
5) Adopt FICUN guidance in building code modifications to mitigate noise for new structures in Noise Zone II areas.	2005-2010
6) Explore all available options for acquisition of strategic properties (i.e. purchase of development rights, transfer of development rights, fee simple purchase, etc).	Ongoing
7) Coordinate with conservation groups and explore greenspace options for strategic lands adjacent to Fort Gordon.	Ongoing
8) Update local planning documents to incorporate JLUS recommendations.	2005-2010
9) Coordinate city-county planning, particularly large-scale development, utilities and road projects.	Ongoing
10) Advise Fort Gordon of pre-planning phase of subdivisions and other large-scale development and redevelopment within 3,000 feet of the installation.	Ongoing

11) Provide noise contour layer in parcel mapping available to residents.	2005-2010
12) Appoint staff to serve on the JLUS committee to monitor and guide implementation of JLUS recommendations.	Ongoing
13) Incorporate JLUS Recommendations in important planning initiatives (air and water quality, transportation, etc).	2005-2010
Fort Gordon	
1) Pursue appropriate measures and construction techniques to minimize noise and smoke effects.	Ongoing
2) Improve existing community relations and education programs to ensure residents are kept informed about operational changes that may alter the noise and burn environment.	Ongoing
3) Develop and maintain user-friendly webpage available to the general public outlining areas of noise.	2005-2010
4) Provide schedule of range activity to local media consistent with security constraints.	Ongoing
5) Update planning documents to incorporate JLUS recommendations.	2005-2010
6) Model smoke effects for future planning efforts consistent with available resources.	2005-2010
7) Appoint staff to serve on the JLUS committee to monitor and guide implementation of JLUS recommendations.	Ongoing
8) Continue to coordinate on important planning initiatives (air and water quality, transportation, etc).	Ongoing
9) Advise local governments of on-post land use changes that may impact adjacent lands.	Ongoing
Implementation Committee / CSRA RDC	
1) Disseminate information on the JLUS and its implementation through ongoing media.	Ongoing
2) Provide a clearinghouse for information to ensure that residents, developers, businesses, and local decision-makers have adequate information about Fort Gordon operations, noise contours, and any additional measures to promote compatibility.	Ongoing
3) Update staff contact directories.	2005-2010
4) Educate stakeholders (lending institution, real estate, developers, etc) on noise and smoke zones.	Ongoing
5) Coordinate with construction and development organizations to ensure familiarity with noise attenuation techniques.	Ongoing
6) Coordinate activities with the GMACC and state & federal stakeholders.	Ongoing
7) Explore partnerships with environmental and conservation organizations and DOD on land use issues and funding.	Ongoing
8) Educate property owners within Noise zone II on attenuation techniques.	Ongoing
9) Develop and monitor best practices.	Ongoing
10) Update regional plans to incorporate JLUS recommendations.	2005-2010
11) Host and provide support for implementation committee meetings.	Ongoing

12) Provide support for tasks outlined.	Ongoing
13) Update JLUS every five years or as needed.	Ongoing

Vision Statement

To encourage an ongoing partnership that promotes development in the CSRA while protecting Fort Gordon's missions and operating environment within a coordinated and flexible planning environment.

1.0 Introduction

Fort Gordon has a long-standing presence in the Central Savannah River Area (CSRA) and the cities and counties around Fort Gordon have grown over the years, reinforcing the close relationship between military and civilian communities. The Fort is critical to the CSRA economy, generating thousands of jobs and billions of dollars in economic activity and tax revenue. Similarly, Fort Gordon service members and civilian employees enjoy the region's great quality of life, benefiting from the amenities of large metropolitan areas but without the congestion and high cost of living. This interdependence, however, poses the challenge that is central to the Joint Land Use Study.

When originally built, most major military installations were located outside urban centers. However, the spin-off economic effects of post operations and the general trend toward growth unrelated to military installations in previously rural and semi-urban areas resulted in new land use challenges. In many cases, development in exiting cities and counties has expanded toward or engulfed installations. According to a General Accountability Office report (GAO 04-608), 80% of communities surrounding military installations are growing at a rate higher than the national average. Increases in population and economic activity draw more people toward the noise and accident risk areas generated by military training.

Adding to the land use mix is changes to modern weapons systems, which have altered the tempo and depth of the battlefield. To meet the challenges of compressed time and expanded space in future conflicts, the Army develops trained soldiers that can deploy rapidly. Success on the battlefield, however, is achieved through hard realistic training that produces skilled soldiers. As firing ranges get longer and more training space is required, noise and safety contour zones are being stretched and extended.

As growth occurs, so too does the tension between land uses as segments of new populations are not economically dependent on the installation, and tend to be annoyed by the noise aspect of military training. Noise from ranges or aircraft provides a specific and undeniable object to complain about. As time goes on, complainers eventually address their issues to higher levels of command and government. In some cases, lawsuits are filed

resulting in installations making unilateral concessions without any reciprocal concessions from neighboring communities.

Encroachment places pressure on installations to modify their operations and procedures, resulting in limitations on support training and for assigned units to maintain adequate level of readiness, possibly compromising the overall mission. For example, the size of the explosives which were used in Engineer field training at Fort Belvoir, Virginia, was restricted severely which made it necessary to move a portion of the training to a less urbanized area at Fort A.P. Hill, Virginia. In another case, limitations were placed upon the type of weapons which could be fired at Fort Dix, New Jersey, as well as the times the weapons could be fired. In both these cases, the limitations on operational activities degraded the installations' capability to support essential training.

Beyond impacts on readiness, encroachment unnecessarily costs the Department of Defense (DOD) funds that can be used for other purposes. Numerous installations were recipients of funding to offset growth in incompatible development. The Air Force plans to spend $21.3 million to buy permanent, restrictive easements on more than 1,768 acres of land to prevent residential development from encroaching on Arizona's Luke Air Force Base and to safeguard the training that occurs on the Barry M. Goldwater Range. Nevada has also received approximately $40 million in federal funds used to acquire 413 acres around Nellis Air Force Base.

These considerations have not escaped defense officials, which have included such criteria in the 2005 Base Realignment and Closure process. When evaluating components of the total military value of a specific military installation, DOD assesses the surrounding local area to determine land use compatibility with regard to mission operations. Consistency assessments are made concerning both present and probable future land use mission compatibility. In order to exhibit military value, installations must demonstrate that present land use in surrounding areas is consistent with operational needs and that effective land use controls are in place to ensure future compatibility.

1.1 Installation Compatible Use Zone and Joint Land Use Study

In order to prevent conflicts between military operations and civilian land use from reaching significant proportions, the Army has worked with the local communities to prevent incompatible land use from occurring and taken reasonable steps to protect communities from noise.

To assist in these efforts, DOD has created two programs designed to address potential land use compatibility issues. 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). The document contains a wealth of information needed for land use decision-making.

IENMPs are designed to address land use issues in a proactive manner. Beyond ICUZ, other elements of the IENMP include education of both the military and civilian communities, management of noise complaints, noise mitigation, and noise abatement procedures. The planning phase includes the following 9-step process:

- Stage 1: Quantify the installation's noise and accident potential environment.
- Stage 2: Identify noise- and accident potential-impacted areas.
- Stage 3: Identify existing and potential incompatible land uses.
- Stage 4: Identify alternative actions to mitigate/minimize noise impacts.
- Stage 5: Evaluate alternative actions.
- Stage 6: Develop agreements with local communities and agencies.
- Stage 7: Submit agreements for review by decision-makers.
- Stage 8: Publish final IENMP and implement agreements.
- Stage 9: Review and update IENMP.

In 1985, 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:

- To encourage cooperative land use planning between military installations and surrounding communities.
- To seek ways to reduce the operational impacts of military installations on adjacent lands.

The JLUS process encourages residents, local decision-makers, and installation representatives to study issues of compatibility in an open forum, balancing both civilian and military interests. Civilian and military stakeholders joined in initiating this effort for the CSRA region. DOD's Office of Economic Adjustment (OEA) funded 75% of the study, which was further supplemented by the resources and efforts of participating local governments, the State of Georgia and the Alliance for Fort Gordon. The reasoning for participating in the project is that the combined resources of all entities are more effective than the separate efforts of each in resolving issues of mutual interest.

1.2 Mission and Setting

Fort Gordon is the largest communications training facility in the Armed Forces (130 courses/16,000 students a year), and is the focal point for the development of tactical communications and information systems. The Leader College of Information Technology is the Army's premiere site for all automation training and home to the Regimental NCO Academy. The installation is also home to the U.S. Army Garrison, 116th Military Intelligence Group (host for the GRSOC joint NSA intelligence mission), the Southeast

Region Medical Command, the Southeast Region Dental Command, the Southeast Region Veterinary Command, Eisenhower Army Medical Center (a teaching hospital), Army's only Dental Laboratory, 249th General Hospital, Regional Training Site-Medical, the National Science Center-Army, two deployable brigades: the 93rd Signal Brigade and the 513th Military Intelligence Brigade, and a Georgia National Guard Youth Challenge Academy.

More specifically, the Installation Mission includes:

- Command and support to all TRADOC, MEDCOM, INSCOM and NETCOM activities and units.
- Training, doctrine, force integration, and mobilization.
- Providing base operations support – ensuring force readiness and mobilization capabilities (to include Reserve Components).

Fort Gordon is located within the Central Savannah River Area (CSRA) in east-central Georgia and occupies approximately 55,600 acres in four counties (Map_1). The majority of the installation and the entire cantonment area lie within Richmond County, with small portions of the training areas in Jefferson, Columbia, and McDuffie Counties (Map_2). Fort Gordon lies nine miles southeast of the city of Augusta, which is situated along the Savannah River. Smaller urban areas closer to Fort Gordon include the urbanized portion of Columbia County, Harlem, Grovetown, Blythe and Hephzibah. Fort Gordon is bound to the north by U.S. Highway 78, on the east and south by U.S. Highway 1, and on its western edge by U.S. Highway 221. Interstate 20, located four miles north of the installation, and Interstate 520 (Bobby Jones Expressway), located two miles east of Gate One, provide service to the installation. There are no public roads and highways on the installation.

World War II brought the activation of Camp Gordon in the Augusta region on December 2, 1941. Initially, Camp Gordon served as a training base for Infantry, Mechanized Infantry, Armored Cavalry, Armor, and as the Southeastern Signal School. The first unit to occupy the new installation was the 4th Infantry Division, however, soldiers from the 26th Infantry Division and the 10th Armored Division also trained at Camp Gordon. All three units were active in Europe under General George Patton's Third Army.

Following the end of WW II, the U.S. Army Personnel Center was established at Camp Gordon. This facility, one of 25 located throughout the country, was responsible for processing returning servicemen (over 85,000 officers and enlisted personnel), and helping with their transition back to civilian life. The post also became home to a U.S. Disciplinary Barracks until 1947.

In 1948, Camp Gordon became home to the Signal Corps Training Center that moved from Fort Monmouth, New Jersey. The U.S. Military Police School also relocated from Carlisle

Barracks, Pennsylvania. During the early 1950s, many other training units were located at Camp Gordon and the Korean War saw the re-establishment of basic training at the installation.

The installation was designated Fort Gordon in March 1956 and established as a permanent Army installation. In August 1956, medical units assigned to Fort Gordon were re-designated Headquarters, U.S. Army Hospital 3441. This hospital eventually became the present Dwight David Eisenhower Army Medical Center (DDEAMC). In 1958, the Civil Affairs School from Carlisle Barracks, Pennsylvania, was relocated to Fort Gordon.

Combat operations resumed at Fort Gordon during 1961 when the Army Training Center Infantry was activated, providing basic and advanced infantry training (AIT). Basic and AIT brigades at Fort Gordon were deactivated in 1970. Further importance was placed on the installation in 1975, when the 1st Signal Training Brigade was activated.

Over the next decade, Signal Corps training was increasingly consolidated at Fort Gordon and following the relocation of all Signal Corps training units from Fort Monmouth, Fort Gordon was re-designated the U.S. Army Signal Center and Fort Gordon (USASCFG), "Home of the Signal Corps". The U.S. Army Signal Corps and Fort Gordon were reorganized in 1978, consolidating all directorates and activities under a single directorate staff.

Today the installation trains soldiers with the most sophisticated communications equipment and technology in existence. The 63rd Signal Battalion moved to Fort Gordon in 1992, the 513th Military Intelligence Brigade arrived in 1993, and the Gordon Regional Security Operations Center (GRSOC) was activated in 1996 (including the 116th Military Intelligence Group, the Naval Security Group Activity, the USAF 31st Intelligence Squadron, and Co D, Marine Cryptologic Support Battalion). In 1998, the 93rd Signal Brigade was activated.

1.3 Economic Impact of Fort Gordon

Fort Gordon's is the region's main employer and drives surrounding local economies. According to the *Economic Impact of Fort Gordon on Columbia and Richmond Counties, Georgia* study commissioned by the Alliance for Fort Gordon, Fort Gordon accounts for over 18,000 civilian and military jobs and generates $1.2 billion dollars in economic activity and tax revenue annually. The Fort provides direct employment to 19.5% of working individuals in Columbia County and 7.4% in Richmond County. Spin-off employment in Richmond County accounts for another 17%. According to the study, the loss of Fort Gordon would result in a decline of approximately 24.5% of the Richmond County and 12.6% of the Columbia County tax base.

The contracting needs of Fort Gordon are substantial and are important to the local economy. With an annual budget of approximately $900 million, the Fort procures a large amount of contract work from the private sector for maintenance, supplies, construction, manufacturing, equipment and materials, transportation, communications, and health and food services. Many local contractors have intentionally located in proximity to Fort Gordon to benefit from contract work.

Fort Gordon also provides a level of economic stability for area economies. Not only are wages for military personnel and civilians working on-post generally higher than the local average but defense spending is relatively unaffected by the financial ups and downs of the private sector. As a result, Fort Gordon provides a stable and consistent source of employment and tax revenue.

Furthermore, Fort Gordon employs personnel who tend to spend their money locally, benefiting area businesses. The development of south Richmond County, for example, is highly dependent on service members and spin-off economic activity. An estimated 25,000 retired military personnel account for a large segment of the population located near Fort Gordon, benefiting from a wealth of medical facilities, cultural and recreational opportunities.

1.4 Project Purpose

Conceived as a proactive regional endeavor to develop a framework for sound decision-making in the years ahead, the purpose of the Fort Gordon JLUS is to facilitate the implementation of compatible land uses around the installation through a cooperative and coordinated planning process among local governments, Fort Gordon, and other stakeholders.

1.5 Project Goals

The goals of the Fort Gordon JLUS are:

- To protect the health, safety and welfare of the civilian and military communities at and around Fort Gordon.
- To protect and promote the present and future operational capabilities of Fort Gordon.
- To encourage cooperative land use planning effort between Fort Gordon and surrounding jurisdictions.
- To institutionalize relations and cooperation between Fort Gordon and surrounding communities.
- To identify and update appropriate land use policies and regulations.

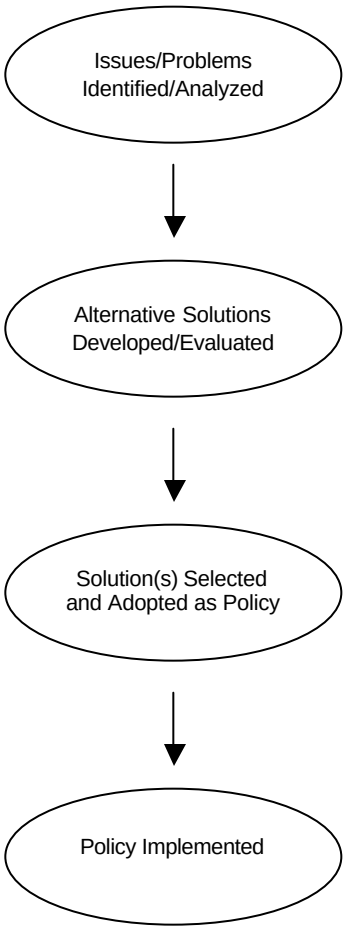
This study is intended to serve as input into the local comprehensive/master planning process for area local jurisdictions adjacent to the installation. The overall objective is to

examine the effects of development patterns and military operations on both Fort Gordon and adjacent communities and establish a context for appropriate land development policies.

Joint land use planning involves a range of competing and complementary interests. The intent of the JLUS process is to strike a reasonable balance in promoting diverse goals.

There is no universal approach to prevent encroachment. The aim is not to prevent growth, but to ensure that land uses in specified areas are compatible with the scope of military activities at Fort Gordon.

1.6 Plan Development and Organization



In September 2004, the Fort Gordon Joint Land Use Study began under the sponsorship of the CSRA Regional Development Center (CSRA RDC) with funding from the DOD's OEA, the State of Georgia, local governments and the Alliance for Fort Gordon.

Participating local government resolved to:

- Participate in the development of the JLUS.
- Designate the CSRA RDC as the sponsor and grantee for the JLUS.
- Appoint representatives to the JLUS policy and technical committees.
- Commit to a good faith effort to implement the JLUS recommendations.

The 2004 JLUS report is organized in four sections. The first section introduces the JLUS project and outlines the report's organization. In addition, the purpose, needs, goals, and objectives of the study are identified. The second section describes existing land use, environmental characteristics, noise environment, and future development potential within the JLUS study area. The third section provides a needs assessment and a review of compatibility measures. The final section identifies recommendations resulting from the study.

A summary of the main components of plan development include:

- Compiling and analyzing existing plans and studies to identify existing data, data needs, and points of consistency and conflict among the existing documentation in the area of encroachment prevention.
- Identifying land uses that are compatible, acceptable, and feasible in the high-noise zones.

- Identifying existing and developing new land use planning tools, strategies, and techniques to prevent encroachment.
- Implementing compatible land use solutions that accommodate urban development while preserving the military mission of Fort Gordon.

The JLUS is both a technical and policy document. It seeks to both understand the land use dynamics at play and proposes specific and achievable implementation strategies based upon sound compatibility criteria. To achieve this, relevant information from both Fort Gordon and local governments was utilized. Development trends related to population growth and infrastructure improvements were measured. These attributes, combined with local comprehensive planning data, environmental characteristics, and present availability of land, were used to determine future development scenarios to evaluate susceptibility of the study area to potential encroachment.

A major component of the JLUS was the development of a regional GIS database for the entire four-county study area. Staff worked with Fort Gordon and local governments to obtain digital parcel, orthophotography, land use, zoning and other existing data needed for technical analyses of issues. Digital data describing noise contour zones were provided by Fort Gordon. Staff had to merge the various data layers from each of the counties to create a central database. All counties project their databases in the same geographic units and organize attribute data in a relatively similar manner, thereby avoiding the need to seam together and reproject different data. The entire GIS project includes parcels, orthophotos, land use, environmental and infrastructure data layers and is available to all local governments for use in future coordinated planning efforts.

The JLUS recommendations are the foundation for future action by a variety of public and private entities as they relate to compatible land use. The intent is to guide local governments in the implementation of appropriate land use policies around Fort Gordon. Recommendations are balanced and designed to protect Fort Gordon's training areas from urban encroachment and the civilian populations from noise and smoke effects.

1.6.1 How to Use the JLUS

The JLUS is not, in itself, an implementation tool, but rather a guide to action. It is intended to serve as a reference point for potential users. A number of companion planning documents should be used in conjunction with the JLUS. These include:

- Fort Gordon Real Property Management Plan
- Fort Gordon Environmental Noise Management Plan
- Local Government Comprehensive Plans
- Local Government Zoning, Subdivision and Land Development Regulations
- Other Fort Gordon and Local Government Planning Documents and Regulations
- Relevant State and Federal Plans and Regulatory Documents

1.7 Public Outreach

The JLUS is intended to be a participatory process with the aim of creating a community-based plan that builds consensus from varied interests, including residents and property owners, local elected officials, business interests, and military representatives. The various individuals that participated in plan development ensures that the JLUS document incorporates a cross-section of opinions and reflects feasible, practical solutions.

All interested parties had access to meaningful and convenient methods of participation, and timely access to draft documents in advance of public meetings. The following steps were taken to maximize participation:

- Holding technical committee meetings at Fort Gordon to ensure participation of installation personnel.
- Posting project information on the CSRA web site (http://www.csrardc.org/jlus)
- Distributing project information to a mailing list of more than 200 community organizations.
- Encouraging local media coverage of the JLUS achievements through distribution of press releases and public service announcements.

The website was used to provide basic information about the JLUS, provide an accessible schedule of meetings, and to provide an additional venue so residents could submit comments.

1.7.1 Public Information Meetings

The CSRA RDC held several meetings to provide information to residents regarding the JLUS process, the goals of the JLUS, project timeline, and to receive comments and input on existing conditions and implementation.

Public information meetings were held on:

- February 21, 2005 (Wrens Community House)
- February 24, 2005 (Grovetown City Hall)
- February 28, 2005 (Augusta Technical Institute)
- March 1, 2005 (McDuffie County Courthouse)
- March 24, 2005 (White Columns Inn)
- March 25, 2005 (Augusta Technical Institute)
- August 11, 2005 (Augusta Technical Institute)

Throughout the course of the study, approximately one hundred residents participated in various public information meetings in addition to local government departments and non-profit organizations. In order to increase participation, meetings were advertised with public notices and held in convenient locations in proximity to Fort Gordon.

Each of the JLUS public information meetings had an identical format. Copies of the JLUS work plan, brochure, and a public comment sheet were distributed. A videotape explaining the JLUS process was also shown. A digital slide presentation was developed and presented at each of the meetings, describing the growing encroachment issues plaguing many military installations, the creation of the Joint Land Use Study process established by DOD to address the problem, and the issues covered in the JLUS. The presentation was followed by a discussion period, designed to answer questions and encourage suggestions.

Public information meetings were preceded by a media press conference held to promote the JLUS. A media packet was distributed to encourage articles and press releases. Local media in all four study jurisdictions published the press release while the Augusta Chronicle provided a more in-depth article about the process, its objectives and intended results.

Issues raised by participants were similar from meeting to meeting. Due to the timing of the project, most comments were related to BRAC. There was no concern expressed by participants about noise and burning generated by Fort Gordon. One attendee noted that noise from the Fort pales in comparison to the mining operations and a local racetrack near the installation. In another case, a participant thought that the smoke effects of control burning were the result of highway construction by the Georgia Department of Transportation. The lack of expressed concern reflects the geographical isolation of the installation and the relatively modest inconvenience incurred as a result of training activities on Fort Gordon.

1.7.2 Policy Committee

The policy committee consisted of local elected officials from participating cities and counties, military leaders, and other stakeholders. As the official decision-making body in the process, the committee provided overall direction to the process, approved study recommendations, and identified appropriate implementation measures. Policy committee members met on the following dates:

- January 25, 2005 (at the CSRA RDC)
- March 24, 2005 (at the CSRA RDC)
- May 2, 2005 (at the CSRA RDC)

1.7.3 Technical Committee

The Technical Committee consisted of city and county staff, as well as military planners. Interviews were held with local and military planners prior to the meetings to set agendas. The committee provided support in producing the necessary analyses. The committee reviewed technical issues, provided feedback on report development, and evaluated

implementation options for the Policy Committee. Technical committee members met on the following dates:

- January 26, 2005 (at Fort Gordon)
- February 14, 2005 (at the CSRA RDC)
- February 21, 2005 (at Fort Gordon)
- April 15, 2005 (at Fort Gordon)

2.0 Existing Planning Environment

Planning for CSRA local governments and Fort Gordon does not occur in a vacuum but is part of broader planning environment encompassing local, state, federal, Army and DOD policies and regulations.

Evolving local, state and federal legislation and regulations have served to increase the Army and Fort Gordon's role in planning issues. The nature of these issues, ranging from environmental protection to public health, highlights the importance of direct Army participation in community and land use planning. Effective coordinated and comprehensive planning, which bridges the gap between Fort Gordon and area local communities, has resulted in the establishment of working relationships that have benefited the region.

2.0.1 Fort Gordon Master Planning Overview

The basis for military land use planning at Fort Gordon lies in Army Regulation (AR) 210-20, *Master Planning for Army Installations*, 16 May 2005:

> "Army installation garrison commanders are the mayors of small cities. As such, they are the directors, influencers, and implementers of present challenges and future change. They must create a vision and a blueprint that enable their installations to respond to future Army missions and community aspirations, while providing and maintaining the capability to train, project, sustain, and support today's force.
>
> "The garrison commander must develop business practices to build enduring, sustainable, and continually improving quality communities and training lands that support mission readiness. They must establish their installations as valued neighbors and trusted partners with surrounding communities. Installations must be recognized as examples of excellent environmental stewardship enhancing the environment for future generations through sustainable design and development. Such quality installations can be achieved by effective use of resources that are guided by the near-term and long-range real property investment goals and objectives of HQDA, the MACOMs, the IMA, and local mission commanders.
>
> "The Army must have a physical plant (to include its ranges and training lands) that fully supports the mission of the tenants and provides an overall environment of quality and protection for the force necessary for national security. The garrison commander's instrument for unifying planning and programming for installation real property management, development, and associated services is the master planning process. This process will be recorded in an installation RPMP. Properly developed, an RPMP will chart a long-term investment strategy for achieving the garrison commander's goals for providing excellent installation physical plants and training lands while supporting the Army's vision for current and future missions.

Installation master planning is based on Fort Gordon's missions and guidance contained in a variety of plans and documents. These references establish trends, strategies, force structure,

programs, and resource requirements upon which planners base short and long-range decisions. Plans and other documents utilized in the master planning process include:

- Army Long-Range Planning Guidance (ALRPG)
- Army Long-Range Facilities Plan (ALRFP)
- The Army Plan (TAP)
- Program Objective Memorandum (POM)
- Program and Budget Guidance (PBG)
- Structure and Manpower Allocation System (SASMAS)
- Army Stationing and Installation Plan (ASIP)
- Resource Management Plan (RMP)/Annual Work Plan (AWP)
- Unconstrained Requirements Report (URR)

Installation polices and procedures are implemented by the Garrison Commander (IMA) in coordination with the Senior Mission Commander (TRADOC). The Garrision Command monitors the readiness of units assigned to the installation. Daily operations and long-range planning are the responsibility of the Garrison Commander and are coordinated with the Senior Mission Commander and Command Group, as well as the commanders of the units assigned to the installation.

Land use management falls under the authority of the Installation Real Property Planning Board (RPPB). The RPPB consists of members of the command, operational, engineering, planning, and tenant interests of Fort Gordon, which assist the Installation Commander in managing and developing the Installation or area facilities and real estate in an orderly manner to satisfy current and future known missions. Table 1 identifies key Fort Gordon branches involved in land use planning.

Table 1: Land Use Planning Branches at Fort Gordon

Branch	Function Related to Land Use Planning
Directorate of Information Management	Examines plans to determine communications/IT feasibility.
Directorate of Morale, Welfare, and Recreation	Participates in the planning of recreational facilities.
Directorate of Plans, Training and Mobilization, including Range Control	Coordinates with the Directorate of Public Works & Logistics on military training requirements and objectives as it relates to the implementation of short and long-term range development plans. Coordinates with DPWL on upcoming training activities that may affect land use.
Environmental Branch - Fish and Wildlife & Environmental Branch – Forestry	Implements fish and wildlife management planning. Implements the natural resources management prescriptions and coordinates with Range Control and other affected branches. Coordinates with state and federal fish and wildlife management agencies in fulfillment of management duties and responsibilities. Implements and incorporate Best Management Practices for forestry. Implements prescribed burning guidelines.

Office of the Staff Judge Advocate	Reviews legal aspects of plan development.
Plans, Analysis, and Integration Office	Provides strategic management in all planning matters.
Public Affairs Office	Serves as conduit to the community outside the installation concerning missions, functions, events.

The Fort Gordon Real Property Management Plan (RPMP) composes the Installation Commander's long-range (20 year) plan for the orderly management and development of the real property assets of Fort Gordon, including land, facilities and infrastructure. It provides the information needed for a comparison of existing facilities to projected facility needs in order to develop various construction projects and other developmental and operational activities. The RPMP provides a reference for the Installation Commander to address the future of the Installation, as well as solving current problems.

The RPMP consists of four components:

- Long-range component
- Capital investment strategy
- Short-range component
- Mobilization component

The components address the management and development of Fort Gordon as it transitions from its existing conditions, through the short term, to support both long-range peacetime and mobilization missions.

The RPMP incorporates concepts and information from many programs and sources to ensure that adequate real property support is provided to meet all assigned or projected missions for Fort Gordon. Mission requirements of other Fort Gordon activities and tenants are included in the RPMP. These other activity requirements provide contributory information or plans to the RPMP to ensure that real property needs are accommodated.

The RPMP enables the Army to reach decisions based upon development and facilities management proposals that best meet the Command goals and mission objectives. These proposals are those that the Army feels are most appropriate for considering the special opportunities and constraints of Fort Gordon. When integrated with RPMPs from other Army installations, the Fort Gordon RPMP helps to establish a point of departure from existing conditions, a target for programming, and a response to planning guidance from the Secretary of Defense and the Joint Chiefs of Staff.

2.0.2 Federal Planning

There are two ways in which federal planning affects Fort Gordon: 1) federal laws and regulations that are applicable across the board and 2) Army and DOD regulations that stipulate direct coordinated planning with federal agencies.

Federal environmental laws and regulations have been enacted for the purpose of protecting, restoring, and enhancing the quality of the nation's air, land, and water. These laws require local, state, and federal agencies comply with environmental regulations. Major federal legislation applicable to Fort Gordon include:

- Clean Air Act (CAA) of 1970 and amended 1977 and 1990
- National Environmental Policy Act (NEPA) of 1969
- Fish and Wildlife Coordination Act of 1965
- Endangered Species Act (ESA) of 1973, Amended 1988
- Migratory Bird Treaty Act of 1972
- National Historic Preservation Act (NHPA) of 1966, amended 1980
- Archaeological and Historic Preservation Act (AHPA) of 1974
- Noise Control Act of 1972, amended 1978
- Federal Water Pollution Control Act (FWPCA) of 1972
- Clean Water Act of 1977
- Water Quality Act of 1987
- Safe Drinking Water Act (SDWA) of 1972, amended 1986
- Wild and Scenic Rivers Act (WSRA) of 1968
- National Wildlife Refuge System Administration Act Of 1966
- Migratory Bird Treaty Act MBTA (Amended 1997)

U.S. AR 200-2, *Environmental Effects of Army Actions*, and numerous other ARs, ensure that land use at Army installations will comply with these and other environmental, cultural, historic protection and restoration laws and regulations.

Some Army regulations stipulate coordinated planning with federal agencies. For example, AR 200-3, Chapter 11, provides cooperative guidance to be followed by installations with the U.S. Fish & Wildlife Service regarding endangered species management on Army installations.

2.0.3 State Planning

Georgia Planning Act

Land use planning in the State of Georgia was overhauled by legislation enacted in 1989. Act 634 of the Georgia Laws 1989 (the Planning Act) provided for the creation of new branches within the Department of Community Affairs: the Office of Coordinated Planning and a Board of Community Affairs. These two agencies are responsible for the preparation and implementation of new minimum standards and procedures for comprehensive land use planning for local and regional jurisdictions in Georgia.

Under the Planning Act, local and regional planning documents are to be prepared using the Minimum Planning Standards and Procedures established by the Board of Community Affairs. The Planning Act established a three-tiered, coordinated planning process involving local governments, regional development centers, and the State. The intention of the Act is

to create an administrative framework for the comprehensive and coordinated management of Georgia's land use, natural and cultural resources, and economic development priorities.

Governor's Military Affairs Coordinating Committee

The Governor's Military Affairs Coordinating Committee, which consists of representatives from local communities and state government, coordinates statewide efforts to retain and expand Georgia's military bases. The Committee works to improve the mission value of the state's installations and the quality of life of the people who live and work there. During the past two years, it has conducted an evaluation of each base and developed a comprehensive action plan to address any shortcomings. The plan is reviewed semiannually and continually adjusted as issues are resolved or new issues arise. Working with the Department of Defense's Office of Economic Adjustment, the Governor and the General Assembly, GMACC is determining which mitigation options are best suited for Georgia.

The committee's most direct tasks related to land use planning include developing best practices, making related proposals to the Governor's Office and assisting in joint land use studies.

2.0.4 Regional Planning

Under the Georgia Planning Act, the Central Savannah River Area Regional Development Center (CSRA RDC), whose territory includes Fort Gordon, is required to prepare and adopt a regional plan, including a land use component.

CSRA RDC

The CSRA RDC is an association of local governments representing the 13-county CSRA, including all the study area local governments (Map_3). Under state law, the RDC operates as an advisory board charged with developing plans and recommending actions to local governments, which local governments may or may not choose to adopt. Through cooperation, coordination and regional planning, member governments can strengthen themselves through the assistance of RDC staff in the areas of planning, public administration, grantsmanship and a variety of other technical areas.

Augusta Regional Transportation Study

Transportation planning for Columbia and Richmond Counties is performed through the Augusta Regional Transportation Study (ARTS), which is a metropolitan planning process as defined by Federal legislation beginning with the 1962 Federal Aid to Highways Act and continuing through current legislation, most recently the Safe, Accountable, Flexible and Efficient Transportation Equity Act (SAFETEA). The ARTS Metropolitan Planning Organization plays a major role in the funding process, determining which projects to include in the Transportation Improvement Program, a list of projects eligible for federal transportation funds.

CSRA Unified Development Authority

The CSRA UDA is a joint development authority whose purpose is to promote the economic development of the CSRA and to encourage cooperation among economic development organizations within the member counties. The UDA provides its members with such services as local/regional planning, state and federal grant support, small business loans, information services and strategic planning. The UDA has an important land use function because members can shape infrastructure decisions.

Local Planning

The Planning Act requires that local governments intent on obtaining certain types of state funding prepare and adopt comprehensive land use plans.

Local governments around Fort Gordon have an influence on land uses at the installation through land development policies enacted for the benefit of their communities. Currently, all four counties and municipalities have land use development plans.

All local governments in the study area have planning agencies whose primary purpose is to direct comprehensive planning efforts. Agencies advise local governments on zoning issues and have direct responsibility for review and approval of subdivision plats. The agencies also have ongoing responsibility for local transportation planning, the preparation of an annual capital budget, recreation planning, historic preservation planning, and other local planning issues that arise.

2.1 Existing Coordination Mechanisms and Compatibility Tools

Understanding Fort Gordon's need to conduct operations training, CSRA local communities have demonstrated a historical commitment to engage in cooperative land use planning. The close, interactive relationship that exists between Fort Gordon and area local government is a direct result of working in partnership for over 50 years.

2.1.1 State Government Compatibility Measures

Through a statewide compatibility project, Georgia is endeavoring to provide the tools needed to address encroachment and land use conflicts that might impact the ability of each base to conduct its missions.

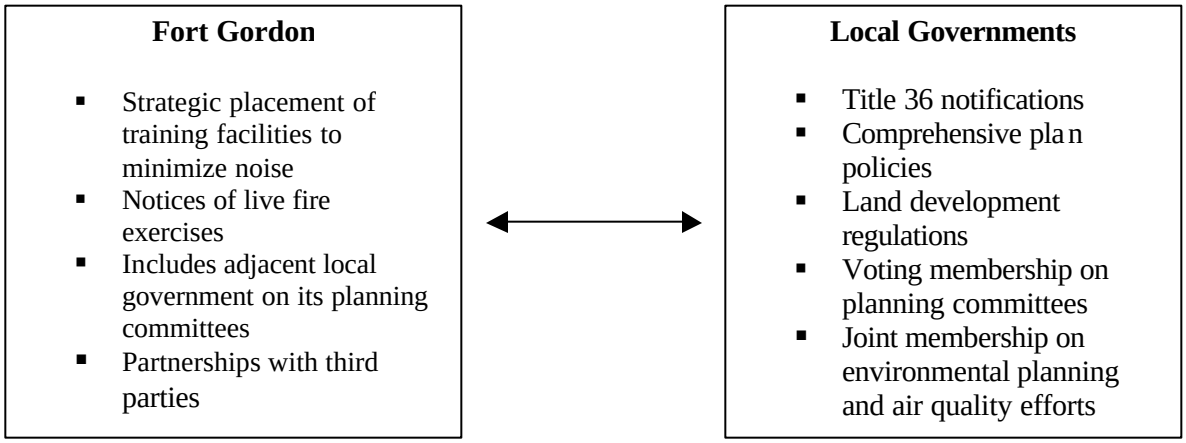
Under state enabling legislation OCGA 36-66-6, local governments abutting all military installations are required to coordinate with installations in considering the impact of zoning decisions on military operations. The law requires local governments solicit a written recommendation from a military base's commanding officer when there is a proposed change in zoning or special exception of property that is within 3,000 feet the installation. This provides an opportunity for Fort Gordon to offer a recommendation regarding the

proposed land use or zoning change and allows installation officials to explain whether or not the proposed change will have a negative impact on operations.

Because the law was adopted in 2003, there have only been a total of 2 Title 36 notifications to date.

2.1.2 Local Government Compatibility Measures

Day-to-day coordination with Fort Gordon involves local planning officials. Planning officials work cooperatively with Fort personnel when issues arise related to land development and property in the vicinity of the installation. The following chart summarizes existing coordination mechanisms between local governments and Fort Gordon.



Area local government planning departments have numerous compatibility measures in place to prevent encroachment along Fort Gordon. These include:

- Comprehensive plan language explicitly promoting land use coordination with Fort Gordon. For example, one of the goals of the Richmond County comprehensive plan is to: "Assure that Fort Gordon remains open by developing new missions, building more support in the metro area, and protecting the Fort from encroachment by conflicting land uses".
- Stated policies to guide targeted growth away from areas that interfere with Fort Gordon's training areas.
- Flexible zoning, such planned unit developments, which reduce post impacts through innovative cluster/site design.

Local governments have also participated in regional efforts to ensure land use compatibility and encourage coordinated planning. These include:

- Providing Fort Gordon a direct role in local transportation planning. Fort Gordon's Garrison Commander is a voting member of the Augusta Regional Transportation

Study (ARTS) Policy Committee and the Fort's Director of Installation Support is a voting member of the ARTS Technical Coordinating Committee.

- Local government planning and Fort Gordon staffs serve jointly on the Augusta Watershed Roundtable.
- Local government planning and Fort Gordon staffs serve jointly on the Augusta Air Quality Task Force sponsored by the Metro Augusta Chamber of Commerce. Other cooperative efforts related to air quality include the Fort's support of Augusta's participation in the Early Action Compact (EAC) related to ozone pollution. Fort representatives also have participated in public meetings related to implementation of EAC-related local air quality initiatives.
- Local government planning staffs serve jointly with Fort personnel on installation environmental planning committees. Recent examples include the Butler Creek Water Supply Watershed Management Plan (2000) and the Installation Environmental Noise Management Plan (2001).

2.1.3 Development of Regional Impacts

The Georgia Planning Act of 1989 authorized the Department of Community Affairs (DCA) to establish procedures for intergovernmental review of large-scale projects. These procedures are designed to improve communication between affected governments and to provide a means of assessing potential impacts of large-scale developments before conflicts arise.

Developments of Regional Impact (DRIs) are defined as large-scale developments that are likely to have effects outside of the local government jurisdiction in which they are located. Table 2 describes development threshold criteria for projects subject to the DRI review process.

Proposed developments that exceed applicable DRI threshold criteria are subject to additional review by the regional planning agency (CSRA RDC) and Fort Gordon if the installation is identified as an affected stakeholder. If a particular project was found to pose a threat to Base operations, recommendations can be made against approval of the project.

Table 2: Thresholds for Developments of Regional Impact

Type of Development	Metropolitan Regions	Non-Metropolitan Regions
(1) Office	Greater than 400,000 gross sq. ft	Greater than 125,000 gross sq. ft
(2) Commercial	Greater than 300,000 gross sq. ft	Greater than 175,000 gross sq. ft
(3) Wholesale & Distribution	Greater than 500,000 gross sq. ft	Greater than 175,000 gross sq. ft
(4) Hospitals and Health Care Facilities	Greater than 300 new beds; or generating more than 375 peak hour vehicle trips per day	Greater than 200 new beds; or generating more than 250 peak hour vehicle trips per day

Type of Development	Metropolitan Regions	Non-Metropolitan Regions
(5) Housing	Greater than 400 new lots or units	Greater than 125 new lots or units
(6) Industrial	Greater than 500,000 gross square feet; or employing more than 1,600 workers; or covering more than 400 acres	Greater than 175,000 gross square feet; or employing more than 500 workers; or covering more than 125 acres
(7) Hotels	Greater than 400 rooms	Greater than 250 rooms
(8) Mixed Use	Gross square feet greater than 400,000 (with residential units calculated at 1800 square feet per unit toward the total gross square footage); or covering more than 120 acres.	Gross square feet greater than 125,000 (with residential units calculated at 1800 square feet per unit toward the total gross square footage); or covering more than 40 acres.
(9) Airports	All new airports, runways and runway extensions	Any new airport with a paved runway; or runway additions of more than 25% of existing runway length
(10) Attractions & Recreational Facilities	Greater than 1,500 parking spaces or a seating capacity of more than 6,000	Greater than 1,500 parking spaces or a seating capacity of more than 6,000
(11) Post-Secondary School	New school with a capacity of more than 2,400 students, or expansion by at least 25 percent of capacity	New school with a capacity of more than 750 students, or expansion by at least 25 percent of capacity
(12) Waste Handling Facilities	New facility or expansion of use of an existing facility by 50 percent or more	New facility or expansion of use of an existing facility by 50 percent or more
(13) Quarries, Asphalt & Cement Plants	New facility or expansion of existing facility by more than 50 percent	New facility or expansion of existing facility by more than 50 percent
(14) Wastewater Treatment Facilities	New facility or expansion of existing facility by more than 50 percent	New facility or expansion of existing facility by more than 50 percent
(15) Petroleum Storage Facilities	Storage greater than 50,000 barrels if within 1,000 feet of any water supply; otherwise, storage capacity greater than 200,000 barrels	Storage greater than 50,000 barrels if within 1,000 feet of any water supply; otherwise, storage capacity greater than 200,000 barrels
(16) Water Supply Intakes/Reservoirs	New Facilities	New Facilities
(17) Intermodal Terminals	New Facilities	New Facilities
(18) Truck Stops	A new facility with more than three diesel fuel pumps; or containing a half acre of truck parking or 10 truck parking spaces.	A new facility with more than three diesel fuel pumps; or containing a half acre of truck parking or 10 truck parking spaces.
(19) All other dev.	1000 parking spaces	1000 parking spaces

Source: Georgia Department of Community Affairs

2.1.4 Fort Gordon Compatibility Measures

In an effort to remain a good neighbor and partner in coordinated planning, Fort Gordon has also developed compatibility measures to prevent encroachment. The most important is the strategic placement of ranges and other training facilities to minimize noise impacts. These efforts have resulted in drastically reduced noise contours off-post. In addition, Fort Gordon regularly publishes notices of live fire exercises in *The Signal* and *The Augusta Chronicle*.

Fort Gordon has restricted certain types of training during certain times to limit noise exposure on nearby communities. Designation of noise-sensitive areas and investigations of noise complaints are compatibility tools used in the planning process.

Noise mitigation is traditionally investigated during the National Environmental Policy Act (NEPA) process for new operations and proposed changes in existing operations. Computer modeling of new training sites offers the prospect of predicting whether a proposed action will be compatible with adjacent land use. This proactive technique offers the opportunity to eliminate sites from consideration or to make design changes (by incorporating noise level reduction features) before the undesirable effects of noise becomes a factor.

Fort Gordon also includes adjacent local government on its planning committees, ensuring coordination in planning efforts. From an encroachment and land use perspective, this includes involvement during the preparation of the Environmental Noise Management Plan, which identifies ICUZ noise contours discussed earlier, education and outreach components, noise complaint management procedures, and noise/vibration mitigation. The program requires that all appropriate governmental bodies be fully informed whenever ICUZ or other planning matters affecting Fort Gordon are under consideration. This includes a positive and continuous effort designed to:

- Provide information, criteria and guidelines to federal, state, regional and local planning bodies, civic associations and similar groups.
- Inform such groups of the requirements of the operational activity, and noise exposure potential and ICUZ plans.
- Describe the noise reduction measures which are being or could be used.
- Ensure that all reasonable, economical and practical measures are taken to reduce or control the impact of noise-producing or hazardous activities so as to minimize the exposure of populated areas.

Fort Gordon in cooperation with The Nature Conservancy of Georgia (TNC) initiated the development of an endangered species management planning process in 1995. The final draft of the Fort Gordon Military Installation Ecosystem-Based Endangered Species Management Plan (EESMP) was prepared with the aim of coordinated planning between the Fort and local governments.

2.2 Fort Gordon Land Use

Land use at Fort Gordon is a function of training that results from installation missions. Training activities can be divided into two broad categories: classroom and field training. These activities are largely conducted by units under one of six U.S. Army Major Command (MACOM) groups: the U.S. Army Signal Center and School under TRADOC; tenant units under MEDCOM, NETCOM and INSCOM; reserve units under the U.S. Army Reserve Command; and National Guard units under the U.S. Army National Guard.

Land use for Army Installations has been standardized into the following categories:

- Administration - Headquarters, offices, records, office supplies, etc.
- Airfield - Runways, operations buildings, maintenance, navigation aids, etc.
- Community Facilities - Commercial and service facilities.
- Family Housing - Housing, support, and recreational facilities.
- Green Space - Safety and secure areas, easements, waters, wetlands, etc.
- Industrial - Manufacturing and utility plants, waste disposal, etc.
- Maintenance - Facilities and shops for all types of equipment.
- Medical - Inpatient and outpatient medical and dental care.
- Outdoor Recreation - Athletic and recreational facilities.

Fort Gordon's land use includes approximately 55,590 acres; 5,590 acres of which comprise the cantonment, 13,000 acres comprise the impact areas, and 37,000 acres comprise on-post maneuver and training areas (Map_4). The installation is subdivided into 49 training areas, 2 restricted impact areas, a main cantonment and an industrial cantonment. Individual and unit (up to battalion size) training are conducted in these areas by the various units. Training consists primarily of advanced individual signal training and unit employment of tactical communications/electronics operations. There is also limited artillery, demolition and airborne troop training on the installation.

Training, maneuver and exercise areas within the reservation boundaries generally occur in the southwestern end of the installation. Several lakes and ponds are scattered among the woodlands and open areas. This portion of the installation supports abundant wildlife habitats. Peripheral land uses are those of farming, woodlands, houses and several small trailer parks on the western end of the installation.

Mechanized training occurred historically and is currently restricted to reserve use. Heavy training impacts on Fort Gordon have been limited to two principal areas. The Small Arms Impact Area (SAIA), approximately 7,500 acres, encompasses 14 active firing ranges. Heavy artillery detonation occurs in the Artillery Impact Area (AIA).

With over 52,000 acres of commercial woodland and unimproved grounds, Fort Gordon has an abundant outdoor recreation resource base varying from forested habitats to forested wetland habitats and open water resources. Existing outdoor recreation areas provide opportunities for camping, picnicking, horseback riding, swimming, hiking, boating, and fishing.

In addition, forest management has been a major land-use on Fort Gordon. Ninety-two percent of the installation is in forest cover, of which 46,145 acres are managed (reforestation, timber and pine straw harvesting, prescribed burning, etc.).

There are 30 reservoirs located on Fort Gordon totaling 435.7 acres. The largest are Butler Reservoir (82 acres), Gordon Lake (37 acres), Leitner Pond (29 acres), Lower Leitner Pond (25 acres), and Upper Leitner Pond (24 acres).

Transportation is another major land use. Ground transportation at the installation is provided through a network of paved (primary roads), unpaved, (secondary roads), and woodland access roads (tertiary roads). The road network includes 92.4 miles of paved roads, 67 miles of unpaved roads, and 610 miles of one and one-half lane earthen permanent firebreaks and woodland access roads.

2.3 Local Government Land Use and Development Trends

2.3.1 Historical Development

Land use patterns in the study area are the result of evolving economic activity and human settlement. Initially, settlement in the Augusta area occurred in close proximity to the Savannah River and nearby trading routes. Harnessing the power of the Savannah River and creeks made it possible to establish mills to produce finished goods out of area agricultural products, particularly cotton. A variety of mineral resources resulted in flourishing mining and brick manufacturing. Development was centered on several small towns, including Bath, Blythe, Mt. Enon, and Hephzibah.

What is now downtown Augusta was the focus of much of the earliest commercial and residential development, but settlement occurred both up and downriver. As the city expanded to the south and west, neighborhoods developed in conjunction with the introduction of new modes of transportation and manufacturing facilities.

The construction and operation of major area institutions, such as Clarks Hill Reservoir, the Savannah River Plant, and Fort Gordon provided both temporary and permanent job opportunities. During the 1950's and 1960's, industrial recruitment and development of planned industrial parks resulted in the expansion of paper, chemical and other manufacturing plants in the region. Improvements in the medical and educational communities also contributed to growth in the region.

New residential and commercial development began to occur in response to these new employment centers. During the 1960's and 1970's, much of the existing single-family housing in south and west Augusta was built, thus giving the urbanized county its present shape. Major new roads such as Gordon Highway, Interstate 20, and the Bobby Jones Expressway, facilitated the movement of people and goods around the area. The paving, widening, and extension of other arterial highways, such as Peach Orchard Road, Walton

Way and Washington Road have facilitated the construction of many new shopping centers, industrial plants, and multifamily residential developments.

As Augusta grew, previously small communities to the west and the south began growing and became residential alternatives to the more urbanized city. Today, a significant part of Columbia County is urbanized or in transition from rural and agricultural uses to urban / suburban uses, particularly single-family residential development and associated retail and service uses. Although some of the growth in the Augusta area has spread to neighboring jurisdictions, Jefferson and McDuffie Counties still remain predominantly rural counties.

Table 3 highlights population growth rates for study area county jurisdictions. The four county area adjacent to Fort Gordon had a combined 2000 population of 327,560, representing a 11.7% increase over the 1990 population of 293,277. The bulk of regional population has historically been in Columbia and Richmond Counties and this trend is projected to continue in the future. Augusta-Richmond County experienced a 5.5% population increase between 1990 and 2000 -- from 189,719 to 199,775, while Columbia County experienced a 35.2% increase in population from 66,031 to 89,288 during this same decade. Jefferson and McDuffie have very small population bases. Growth has been very limited (or even in decline for Jefferson County) and their combined 2000 population represents only 11% of the study area's total.

Table 3: County Study Area Population Growth, 1990-2000

County	Population 1990	Population 2000	% Change
Columbia County	66,031	89,288	35.2%
Jefferson County	17,408	17,266	-0.8%
McDuffie County	20,119	21,231	5.5%
Richmond County	189,719	199,775	5.3%
Total	293,277	327,560	11.7%

Source: U.S. Bureau of the Census

Among the municipalities, with the exception of Harlem, growth has outpaced the counties (Table 4). Grovetown and Hephzibah continue to grow as the provision of utilities continues to be expanded.

2.3.2 Current Land Use

The CSRA region is primarily rural with the exception of two larger urban population centers within Columbia and Richmond Counties. Generally, existing land uses and development patterns within the study area can be characterized as typical urban/suburban areas in pre-established cities with rural areas future away.

Table 4: City Study Area Population Growth, 1990-2000			
City	Population 1990	Population 2000	% Change
Blythe	300	718	139.3%
Grovetown	3,596	6,089	69.3%
Harlem	2,199	1,814	-17.5%
Hephzibah	2,466	3,880	57.3%
Total	8,561	12,501	46%

Source: U.S. Bureau of the Census

Table 5 identifies current land use for jurisdictions abutting Fort Gordon. Augusta-Richmond County is the cultural and economic center of the region and displays the most diversified land use patterns of all study area jurisdictions. No single uses accounts for more than 27% of total land use.

Table 5: Study Area Current Land Use								
	Augusta-Richmond County		Columbia County		Jefferson County		McDuffie County	
	Acres	%	Acres	%	Acres	%	Acres	%
Residential	52,052	26.5%	43,171	21.9%	16,916	5%	29,777	20.3%
Commercial	5,716	2.9%	2,416	1.2%	1,470	0.4%	1,590*	1.1%
Industrial	9,203	4.7%	2,211	1.1%	5,166	1.5%	-	-
Public/Instit.	52,753**	26.9%	4,322	2.2%	7,041	2.1%	7,013	4.8%
TCU^	11,520	5.9%	7,671	3.9%	168	0%	9	0%
PRC^^	5,873	3%	10,303	5.2%	7,197	2.1%	-	-
Agric. & For.	29,236	14.9%	126,727*	64.4%	302,033	88%	84,360	57.4%
Undeveloped	29,794	15.2%	-	-	0	0%	0	0%
Other	0	0%	0	%	0	0%	24,245*	16.5%
Total	196,147	100%	196,823	100%	339,991	100%	146,994	100%

Source: Augusta-Richmond County Comprehensive Plan; Columbia County Growth Management Plan; Jefferson County Joint Comprehensive Plan; McDuffie County Joint Comprehensive Plan

^: Transportation, Communications and Utilities
^^: Parks, Recreation and Conservation
*: Included in other land uses or included in other uses
**: Includes 44,286 acres at Fort Gordon

Because of its close proximity to Augusta, Columbia County has seen a transformation from a rural county to a bedroom community. Over the last 30 years the County has been urbanizing rapidly, with a large portion of that growth occurring in the past 10 years. Census data for the period 1990-2000 indicates that Columbia County captured approximately 90% of the study area's growth. The result has been increasingly urbanized areas concentrated in the Evans-Martinez area and in the cities of Harlem and Grovetown.

As part of the Augusta metropolitan area, Jefferson and McDuffie County residents enjoy the cultural and employment benefits of being part of a metropolitan area that is approaching an overall population of a half a million people. Although home to several large companies, the majority of businesses located in these counties are retail and service oriented, and their function is primarily to meet the immediate needs of their residential populations.

Close to 60% of McDuffie County land use is agricultural and forestry, a rate that is far higher when excluding Thomson, the county seat and relatively urbanized area.

Jefferson County is a largely rural community containing the least intensely developed lands within the Fort Gordon study area. According to the Jefferson County Comprehensive Plan, just over 88% percent of the county's total acres are devoted to agricultural and forestry uses. Jefferson County is also the only study area jurisdiction to have lost population (-6.1%) between 1990 and 2000.

Residential

Residential land uses vary within the study area. Richmond County has the most diverse residential land uses with no one type of housing being dominating. In the downtown area, residential land use is more concentrated and primarily multi-family with single-family housing and town homes further out.

Much of the single-family, detached housing is clustered in subdivisions located between major arterial highways and collector streets. Most of the apartment complexes in the county are located in close proximity to major roads, shopping centers, and entertainment facilities. The large number of multifamily units along the Washington Road and Bobby Jones corridors is a good example of this trend.

The predominant built-up land use in Columbia County is low-density residential. Housing is mostly single-family units built in traditional subdivisions in the Evans-Martinez area, and large lot and estate type developments in the less urban areas of the County.

Residential land uses in Jefferson and McDuffie Counties are dispersed and account for a small fraction of total land use.

Commercial and Industrial

The study area has a diversified economy with major sectors including agriculture, manufacturing, government, retail and wholesale trade. Most of the region's labor force resides in Richmond and Columbia Counties, as do most of the region's jobs.

Commercial land uses are scattered throughout Richmond County and the Evans-Martinez areas.

Most major manufacturing plants are situated in industrial parks or on large individual sites near the interstates and other major four-lane highways. In Richmond County, manufacturing is concentrated in the east side of the county. Manufacturing plants are also located off I-20 in Columbia and McDuffie Counties and along U.S. 1 in Jefferson County. The advantages of these areas include the relatively flat terrain, availability of all needed utilities, and proximity to transportation links.

Mining operations are scattered around the study area, most of which are located in north Jefferson County, just south of Fort Gordon.

Institutional

Almost all public and institutional land uses are located within the urbanized areas of Augusta, Evans-Martinez, and the municipalities of Blythe, Grovetown, Harlem, Hephzibah, Louisville, Wrens, and Thomson. A typical layout includes a city hall or county courthouse, surrounded by related government functions such as Sheriff's offices, boards of education, fire stations, etc. Park and recreation areas tend to be scattered throughout the study area.

Major government employers in the area include Fort Gordon, state universities and technical colleges, local school systems, and federal, state and local government agencies.

Transportation

Adequate roadway networks that include two interstate highways, several U.S and Georgia highways, and numerous local streets and roads serve the study area jurisdictions. Interstate 20 passes through Richmond, Columbia and McDuffie Counties and connects Augusta to Columbia and Atlanta. Interstate 520 is a circumferential limited access highway that begins at 1-20 in west Richmond County and continues in a southeasterly direction.

Four major U.S. highways enter Augusta from South Carolina on the east side of Augusta. U.S. 1, 25, 78, and 278 are converged as the Gordon Highway until just south of the city limits when U.S. 25 continues in a southerly direction and travels into Burke County. U.S. 1, 78 and 278 continue in a southwesterly direction as the Gordon Highway and heads south at Rocky Creek and continues through Jefferson County.

On average, transportation accounts for 5% of all land uses in the study area.

2.3.3 Land Use within 1-mile Radius of Fort Gordon

Land uses in proximity to Fort Gordon vary from semi-urban to rural. Map_5 displays land use within a 1-mile radius of Fort Gordon and Maps 6, 7, 8, and 9 provide detailed aerial photography for different areas around the installation.

In western Richmond County, land use adjacent to Fort Gordon follows a pattern of more densely developed areas forming a crescent from the northeast and circling around the reservation perimeter to Tobacco Road. From the Columbia County line around to Tobacco Road the pattern of land use closest to Fort Gordon is single-family residential with some mobile home development. Additionally, there is some multi-family development scattered throughout this area and business/commercial uses along the major thoroughfares such as Gordon Highway and Deans Bridge Road.

The U.S. 1 corridor is lined with businesses north of Gate 5, and there is a mixture of rural residences, businesses, and undeveloped land south of Gate 1. The other section of U.S. 1 is a parallel corridor to the southeast that is predominantly agricultural in character. The major exceptions to this are the cities of Hephzibah and Blythe, which are urbanized.

The pattern of land use in the area of Columbia County closest to Fort Gordon is mixed. The areas further away from Evans-Martinez are undeveloped and form the largest portion of land use adjacent to the installation. However, the areas closest to Grovetown contain low-density suburban-type single-family residential uses.

Land use adjacent to Fort Gordon in Jefferson and McDuffie Counties is agricultural in character and extends from the Richmond and Columbia County lines deeply into those counties.

2.3.4 Development Intensity

Data collected from local government planning and licensing departments indicate varied patterns of development intensity between 2000 and 2004 (Tables 6-9). Building permits reflect the rapid growth of Columbia County and moderate growth in Richmond County. Overall, the number of building permits issued in McDuffie and Jefferson Counties has remained flat between 2000 and 2004.

There are no records of any building permits issued within a 1-mile radius of Fort Gordon in Columbia, Jefferson and McDuffie Counties. In Richmond County, it is estimated that only a handful of the over 3,000 permits issued were to the north and east of the installation since 2000.

Table 6: Columbia County Issued Building Permits, 2000-2004

Year	Single-Family	Two-Family	Multi-family	Town Home	Mobile Home	Comm.	Industrial
2000	792	0	0	84	169	89	0
2001	874	0	0	105	92	83	0
2002	912	2	1	259	85	78	0
2003	1,113	0	0	218	70	64	0
2004	921	10	0	320	54	90	0
Total	4,612	12	1	986	470	404	0

Source: Columbia County Building Standards

Table 7: McDuffie County Issued Building Permits, 2000-2004

Year	Single-Family	Two-Family	Multi-family	Town Home	Mobile Home	Comm.	Industrial
2000	52	1	0	0	103	10	0
2001	53	2	0	6	90	8	0
2002	63	1	0	4	86	15	0
2003	82	1	0	0	75	2	0
2004	82	0	0	0	78	5	0
Total	332	5	0	0	432	40	0

Source: McDuffie County Planning & Zoning

Table 8: Jefferson County Issued Building Permits, 2000-2004

Year	Residential	Commercial	Mobile Home
2000	37	*	98
2001	35	*	66
2002	36	*	65
2003	20	4	61
2004	25	9	57
Total	153	13	347

Source: Jefferson County Buildings & Inspection
* Included with residential permits

Table 9: Richmond County Issued Building Permits, 2000-2004

Year	Single-Family	Multi-Family	Mobile Home	Commercial & Industrial
2000	483	5	N/A	N/A
2001	548	21	298	75
2002	565	28	267	67
2003	664	6	226	105
2004	822	0	257	72
Total	3,082	60	1,048	319

Source: Augusta-Richmond County License & Inspection
N/A: Not Available

Another measure of development intensity is urban areas as defined by the U.S. Bureau of the Census. The Census includes a number of variables in determining urban areas, including densities, population and land use. As seen in Map_10, urban area boundaries have not changed significantly between 1990 and 2000. With the exception of Thomson and Wrens

(located 7 to 12 miles away from Fort Gordon), there are no urban areas in the unincorporated areas of Jefferson and McDuffie Counties. In Richmond County, the urban area has expanded westward and southerly while in Columbia County, urban expansion has occurred in a westward fashion.

In 2000, approximately 16.6% of the acreage within a 1-mile radius of Fort Gordon was classified as urban, mostly in Richmond County, representing a 4.1% increase from 1990.

Table 10 presents parcels and acreage in the vicinity of Fort Gordon. No more than 7% of the counties' parcels and 8% of acreage are located within a 1-mile radius of Fort Gordon. The difference in parcel and acreage ratios between the counties reflects the more urbanized nature of Columbia and Richmond Counties.

Table 10: Parcels and Acreage within a 1-mile Radius of Fort Gordon

County	Parcels within 1-Mile	Total Parcels	%	Acres within 1-mile	Total Acres	%
Columbia	1,666	27,709	6.5%	7,561	185,600	4%
Jefferson	87	6,520	1.3%	6,190	337,920	1.8%
McDuffie	157	11,956	1.3%	5,381	166,400	3.2%
Richmond	5,345	76,038	7%	17,422	207,360	8.4%
Total	7,225	122,223	5.9%	36,554	897,280	4%

Table 11 and Maps 11, 12 highlight population in the vicinity of Fort Gordon. There are approximately 23,167 people that live within a 1-mile radius of the installation, an increase of 55% since 1990. Approximately 80% of these residents live within Richmond County. Since 1990, the number of people in the county within a 1-mile radius has increased 52%.

Table 11: Population within a 1-mile Radius of Fort Gordon

	1990			2000		
County	Population within 1-Mile	Total Pop.	%	Population within 1-Mile	Total Pop.	%
Columbia	2,266	66,031	3.4%	4,105	89,288	4.6%
Jefferson	114	17,408	0.7%	188	17,266	1%
McDuffie	222	20,119	1.1%	101	21,231	0.5%
Richmond	12,278	189,719	6.5%	18,773	199,775	9.4%
Total	14,880	293,277	5.1%	23,167	327,560	7.1%

Approximately 4,105 people or 4.6% of the Columbia County population lies within 1-mile of Fort Gordon, an increase of 80% since 1990. Most of the growth has occurred in and around the Grovetown area.

Combined, about 200 people or less than 1% of the population in Jefferson and McDuffie Counties lie within 1-mile of Fort Gordon. In Jefferson County, there are fewer people

residing near the installation than in 1990. The mining and agricultural operations in those counties limit population growth.

Table 12 and Map_13 present rezoning data within a 1-mile radius of Fort Gordon in Richmond and Columbia Counties since 2000. A rezoning is typically requested when a property owner wishes to use a piece of property for a land use not permitted in the existing zoning district. The table identifies rezonings that are considered potentially incompatible. Incompatible rezonings typically include conversions from:

- Undeveloped to Residential or Commercial
- Agricultural to Residential or Commercial
- Industrial to Residential or Commercial
- Low Density Residential to Commercial or other high traffic-generating uses

It is important to recognize that potentially incompatible rezonings are considered incompatible only in the context of the JLUS. From the community's perspective, there are many cases when rezoning is desirable. These include:

- When the requested rezoning is consistent with long range land use plans adopted by the appropriate governing body.
- When there was an error or oversight in the original zoning of the property.
- When changes have occurred to conditions in the vicinity of the property which prevent the reasonable use of the property as currently zoned.

Overall there have been very few incompatible rezonings in the study area and even fewer within a 1-mile radius of Fort Gordon.

Table 12: Rezonings within 1-mile in Richmond and Columbia Counties, 2000-2004

	Columbia County			Richmond County		
Year	# of Rezonings	# Incompatible	# Within 1-mile	# of Rezonings	# Incompatible	# Within 1-mile
2000	57	2	0	87	17	6
2001	48	3	0	64	9	1
2002	63	3	0	128*	29	0
2003	60	1	0	84	22	1
2004	48	2	0	88	13	1
Total	276	11	0	451	90	9

Source: Augusta-Richmond County Planning Commission; Columbia County Planning & Development
* Includes special exceptions by order of the Augusta-Richmond County Commission

2.3.5 Jurisdictional and Land Ownership Patterns

Land ownership within a 1-mile radius of Fort Gordon can be divided into two principal classifications: government and private. With the exception of Fort Gordon, there are no

federal lands within 1-mile of the installation. State agencies such as the Department of Natural Resources and the Department of Transportation hold some easements but these are a very minor component of overall land use. There are some municipal lands within Grovetown and Blythe.

Private ownership characterizes the majority of land around Fort Gordon. South of the installation, mining companies and individual farmers hold relatively large tracts of land. To the west, private lands are primarily agricultural from Jefferson County through the southern portion of Columbia County. To the north and the east, there are some municipal facilities embedded with private lands, mostly residential properties.

2.4 Noise Environment

The Army established the Environmental Noise Management Program as the framework for the control of noise produced by Army activities since noise has been determined by the United States Congress to negatively impact the health and welfare.

The ICUZ program provides a method for evaluating the effects of noise and the hazards associated with training operations, which stem from activities at military installations. The purpose of ICUZ is to identify land areas that are exposed to generally unacceptable noise levels and to then recommend uses for the land lying within these areas that are compatible with the needs of the civilian community and the Army.

Military noise environments typically consist of three classes: transportation, small arms fire, and high amplitude impulsive noise. Fort Gordon's noise sources consist primarily of:

- Small arms firing
- Large arms weapons firing
- Demolition activity

Currently, Fort Gordon contains an inactive G130 tactical airstrip in the range of the installation and aircraft are not a major component of the post's noise environment. The basic fixed-wing needs of Fort Gordon are served by Bush Field, nine miles east of the installation, and Daniel Field located five miles northeast of the installation in Augusta. Both airfields are owned and operated by Augusta-Richmond County.

Noise zones are not just physical lines on a map, but rather translate into important limitations for the Army on where development can occur. For example, while military personnel can be housed in existing buildings within moderate noise areas, new housing may be built in this zone only if acoustically designed to be insulated from noise-impacts. Housing is not permitted in high noise areas regardless of sound insulation. The same holds true for lands outside the installation boundary. If a certain type of proposed training is expected to generate high noise levels impacting densely populated areas, the Army is unlikely to approve the training.

The Federal Aid to Airports Act (1962) exempts military installations, as does portions of the Noise Control Act (1972). However, the Noise Control Act and the Quiet Communities Act (1978) does contain language outlining the responsibilities of federal agencies in protecting the public from unreasonable noise impacts. Specifically these laws state that:

> "Federal agencies shall, to the fullest extent consistent with their authority under the federal laws administered by them, carry out the programs within their control in such a manner as to promote an environment for all Americans free from noise that jeopardizes their health and welfare".

Approvals of mortgage loans from the Federal Housing Administration (FHA) and the Veterans Administration (VA) are subject to the United States Department of Housing and Urban Development (HUD) regulations. The regulation sets forth a discretionary policy to withhold funds for housing projects when noise exposure is in excess of proscribed levels. Residential construction may be permitted in moderate noise areas, provided sound attenuation is accomplished. The added construction expense of sound attenuation, however, may make sitting in these noise exposure areas financially less attractive. No federally financed mortgages will be given for new housing in high noise areas.

A noise complaint procedure is required by Army Regulation (AR) 200-1 (U.S. Army 1997) to log and investigate all complaints. Logs contain the complaint location, date, time, and cause of complaint. A review of Fort Gordon's complaint log reveals only one complaint since the introduction of the log.

2.4.1 Average Annual Noise Contours

The Army originally depicted noise based on a computer simulation that processed data such as the type of weapons fired from each range or firing point, 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 was the standard, accepted methodology for modeling noise impacts of military activity on surrounding lands. The modeling took into account variables such as:

- Maximum loudness
- Length of loudness
- Frequency of loudness

The contours around an installation reflected an annualized noise measure that converted noise varying from peak bursts to relative quiet into a steady measure of acoustic energy over a 24-hour period. The contours essentially took all operations that occurred at Fort Gordon over the year and divided by 365 days, producing the average day-night sound level (DNL).

The military measured noise in decibels (dB) and assigned a weighting based on the noise frequency and source. A-weighting, expressed as dBA, depicted higher frequency noise caused by small arms firing, aircraft use, and vehicle operations. C-weighting measured more

of the low frequency and vibration associated with the firing of larger weapons systems and demolitions activities (dBC).

Experts at the Environmental Noise Program, US Army Center for Health Promotion and Preventive Medicine (USACHPPM), developed a 3-step noise model. The zones and their corresponding land use guidance include:

- **Noise Zone I -** includes areas around a noise source in which the DNL is less than 65 dBA and less than 62 dBC. This area, considered to have moderate to minimal noise exposure, is acceptable for noisesensitive land uses including housing, schools, and medical facilities. This noise zone does not trigger compatibility issues with any uses.

- **Noise Zone II -** consists of an area where the A-weighted DNL is between 65 and 75 decibels and the Gweighted 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 industrial, 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 -** 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. This zone is considered an area of severe noise exposure and is unacceptable for noise sensitive activities.

For purposes of evaluating compatibility, the USACHPPM draws guidance from The Federal Interagency Committee on Urban Noise (FICUN) land use guidelines (see Appendix A). FICUN's land use compatibility guidelines are suggestions only and do not determine what uses of land are acceptable within communities. Only local governments have the authority to determine permissible land uses and to define the relationship between specific properties and noise contours.

Map_14 displays noise contours under the annualized average methodology. The incompatible use zones for both small and large weapons firing (larger than 20-mm) resulting from activities on Fort Gordon do not extend beyond the installation boundaries and therefore do not pose compatibility issues with surrounding civilian uses.

2.4.2 Peak Noise Contours

Planners at the USACHPPM recognize that annualized average noise contours do not accurately measure noise levels and have been promoting peak contours as the standard in noise planning. Peak noise captures impacts at the point. The U.S. Army is expected to adopt peak noise methodology shortly.

Although the new standards measure noise in peak decibels (dBP), there is a one-to-one conversion from the older DNL standard (Table 13).

Table 13: Noise Conversion

Noise Zone	Average	Peak	Risk of Complaints
NZ1	0-65 dNL	0-115 dBP	Low
NZ2	65-75 dNL	115-130 dBP	Moderate
NZ3	75+ dNL	130+ dBP	Very High

Source: FICUN; USACHPPM

Map_15 displays peak-noise impacts. Due to the vast size of Fort Gordon and the strategic placement of impact areas, the majority of serious artillery and large arms noise levels are contained within the boundaries of the installation. Noise Zones I and II, however, extend beyond the installation and affect all four neighboring counties and the city of Blythe.

Guidance suggests that all uses are compatible with noise exposure up to 115 dBP (shown in green). With exposure within 115–130 dBP contours, additional protective measures, such as indoor noise reduction, for residential uses may be warranted (shown in yellow). Many uses, such as manufacturing, retail, government facilities, and agriculture are suitable even within this noise setting. Guidelines deem noise exposure that exceeds 130 dBP to be incompatible with all residential uses (shown in red).

When compatible, land uses can exist next to each other without causing interference or exposing people to undue safety risks or nuisance. In the JLUS context, Fort Gordon 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).

Tables 14 and 15 and Maps 16, 17 provide a more in-depth assessment of populations affected by the different noise zones. Approximately 2,287 people live within NZ I, slightly over double the 1990 rate. Population growth within NZ I has occurred primarily in Richmond and Colombia Counties. Combined, the counties accounted for close to all population within NZ I.

Approximately 74 people reside within NZ II in Richmond and Jefferson Counties, a rate more of less in the line with 1990 figures. The prevalence of mining and agricultural operations has limited population growth within NZ II.

Table 14: Population within Noise Zones, 1990

County	Total Population	Total Within NZ I	% Within NZ I	Total Within NZ II	% Within NZ II	Total Within NZ III	% Within NZ III
Columbia	66,031	258	0.4%	0	0%	0	0%
Jefferson	17,408	0	0%	28	0.1%	0	0%
McDuffie	20,119	124	0.6%	0	0%	0	0%
Richmond	189,719	657	0.3%	31	0.01%	0	0%
Total	293,277	1,039	0.3%	59	0.02%	0	0%

Source: Population data from U.S. Bureau of the Census; Calculations by CSRA RDC

Table 15: Population within Noise Zones, 2000

County	Total Population	Total Within NZ I	% Within NZ I	Total Within NZ II	% Within NZ II	Total Within NZ III	% Within NZ III
Columbia	89,288	802	0.9%	0	0%	0	0%
Jefferson	17,266	0	%	40	0.2%	0	0%
McDuffie	21,231	154	0.7%	0	0%	0	0%
Richmond	199,775	1,331	0.6%	34	0.01%	0	0%
Total	327,560	2,287	0.7%	74	0.02%	0	0%

Source: Population data from U.S. Bureau of the Census; Calculations by CSRA RDC

Table 16 and Map_18 list affected lands within NZ I. Approximately 1,079 parcels or 12,508 acres lie within NZ I, representing approximately 1% of parcels and acreage in the study area. Affected lands range from 0% in Jefferson County to a slightly over 3% in Richmond County.

Table 16: Parcels and Acreage within Noise Zone I

County	Total Parcels	# of Parcels within NZ I	% of Parcels within NZ I	Total Acres	# of Acres within NZ I	# of Acres within NZ I
Columbia	27,709	405	1.5%	196,823	4,893	2.5%
Jefferson	6,520	0	0%	339,991	0	0%
McDuffie	11,956	54	0.4%	146,994	1,124	0.7%
Richmond	76,038	620	0.8%	196,147	6,491	3.3%
Total	122,223	1,079	0.9%	879,955	12,508	1.4%

Source: Parcel data from CSRA RDC, Augusta-Richmond County GIS, Columbia County GIS; Calculations by CSRA RDC

Table 17 and Map_18 present affected lands within NZ II. Approximately 69 parcels or 3,803 acres lie within NZ II, representing less than 1% of parcels and acreage in the study

area. Affected lands range from 0% in Columbia and Jefferson Counties to approximately 0.8% in Richmond County.

Table 17: Parcels and Acreage within Noise Zone II

County	Total Parcels	# of Parcels within NZ II	% of Parcels within NZ II	Total Acres	# of Acres within NZ II	# of Acres within NZ II
Columbia	27,709	0	0%	196,823	0	0%
Jefferson	6,520	32	0.5%	339,991	2,121	0.6%
McDuffie	11,956	0	0%	146,994	0	0%
Richmond	76,038	37	0.04%	196,147	1,682	0.8%
Total	122,223	69	0.05%	879,955	3,803	0.4%

Source: Parcel data from CSRA RDC, Augusta-Richmond County GIS, Columbia County GIS; Calculations by CSRA RDC

Another method of measuring the population impacts of noise zones is to examine local government rezonings. Tables 18 and 19 and Map_19 present rezoning data within the noise zones in Columbia and Richmond Counties. Since 2000, there have been a total of 111 potentially incompatible rezonings and only 1 within NZ I, representing a 0.9% of all potentially incompatible rezonings. There have not been any rezonings within NZ II contours.

Table 18: Rezonings within Noise Zones in Columbia County, 2000-2004

Year	# of Rezonings	# Incompatible	# Within Noise Zone I	# Within Noise Zone II	# Within Noise Zone III
2000	57	2	0	0	0
2001	48	3	0	0	0
2002	63	3	0	0	0
2003	60	1	0	0	0
2004	48	2	0	0	0
Total	276	11	0	0	0

Source: Rezoning data from Columbia County Planning & Development; Calculations by CSRA RDC

Table 19: Rezonings in within Noise Zones Richmond County, 2000-2004

Year	# of Rezonings	# Incompatible	# Within Noise Zone I	# Within Noise Zone II	# Within Noise Zone III
2000	87	17	0	0	0
2001	64	9	1	0	0
2002	128*	29	0	0	0
2003	84	22	0	0	0
2004	88	13	0	0	0
Total	451	90	0	0	0

Source: Rezoning data from Augusta-Richmond County Planning & Zoning; Calculations by CSRA RDC
*Includes 39 petitions by the Augusta Commission

2.5 Growth and Development Potential

The Augusta metropolitan area is projected to enjoy moderate growth through 2025. Proximity to major cities, good climate, available utilities and transportation infrastructure, and favorable topography will result in increases to the region's population base. Furthermore, major area employers such as Fort Gordon, Savannah River Site, the Medical College of Georgia and a wealth of state and federal government agencies ensure stable sector employment. While these employers m1ay not necessarily see growth, there is little likelihood that major job losses will occur.

Table 20 presents population forecasts through 2025. Overall, the study area is projected to grow by 25.4% through 2025, with most of the growth occurring in Columbia County. Growth levels will vary within the region from an estimated 0% in Jefferson to 62% in Columbia County. Both McDuffie and Richmond Counties are projected to post very mild growth rates.

Table 20: County Study Area Projected Population Growth, 2000-2025

County	Population 2000	Population 2025	% Change
Columbia County	89,288	144,667	62%
Jefferson County	17,266	17,260	0%
McDuffie County	21,231	24,340	14.6%
Richmond County	199,775	224,715	12.5%
Total	327,560	410,982	25.4%

Augusta-Richmond County Planning & Zoning; Columbia County Planning & Development; Woods Poole Economics (2003)

Based on local comprehensive plans, the following planning assumptions summarize anticipated future land use trends over the next 20 years.

1. Moderate to High Residential Growth
2. Moderate Commercial Growth
3. Moderate Industrial Growth
4. Declining Agricultural and Forestry
5. Moderate Parks, Recreation and Conservation Growth

Table 21 describes future land use acreage as contained in area comprehensive plans. Overall, growth will occur across all land uses with the exception of agriculture and forestry. The most noticeable trend is the projected increase of residential land in Columbia County. The county is projected to increase its residential land use by 150% or approximately 65,000 acres. Although the county's growth has been spreading westward, pressures to develop further south is conceivable. Residential land uses within other counties are projected to remain stable due to development opportunities within current residential areas in Augusta, Wrens and Thomson.

Table 21: Study Area Future Land Use								
	Augusta-Richmond County		Columbia County		Jefferson County		McDuffie County	
	Acres	%	Acres	%	Acres	%	Acres	%
Residential	59,886	30.5%	107,996	54.9%	18,625	5.5%	32,110	21.8%
Commercial	7,356	3.8%	4,848	2.5%	1,526	0.4%	11,074	7.5%
Industrial	11,174	5.7%	8,866	4.5%	7,328	2.2%	-	-
Public/Instit.	53,155**	27.1%	4,352	2.2%	7,041	2.1%	7,882	5.4%
TCU^	11,770	6%	7,708	3.9%	7,197	2.1%	9	0
PRC^^	12,296	6.3%	11,565	5.9%	168	0%	-	-
Agric. & For.	22,130	11.3%	51,485*	26.2%	298,106	87.7%	72,100*	49%
Undeveloped	18,380	9.4%	-	-	0	0%	0	0
Other	0	0%	0	0%	0	0%	23,819*	16.2%
Total	196,147	100%	196,823	100%	339,991	100%	146,994	100%

Source: Augusta-Richmond County Comprehensive Plan; Columbia County Growth Management Plan; Jefferson County Joint Comprehensive Plan; McDuffie County Joint Comprehensive Plan

^: Transportation, Communications and Utilities
^^: Parks, Recreation and Conservation
*: Included in other land uses
**: Includes 44,286 acres at Fort Gordon

In terms of the distribution of growth, local comprehensive plans contain numerous targeted growth areas, none of which lie within Fort Gordon's critical training areas or nose zones (Map_20):

- Columbia County: Growth focused in compact areas to the west and in and around Grovetown.
- Jefferson County: Growth concentrated near the airport areas in Wrens and Louisville, 10 and 25 miles away from Fort Gordon.
- McDuffie County: Growth focused in the Thomson area just south of I-20
- Richmond County: Growth focused in west and south-central Richmond County.

Further, local plans include various recommendations to encourage commercial development on heavy arterial highways where commercial or institutional development is now established, encourage infill development and concentrate multi-family and high density housing in commercial and transitional commercial/residential areas, making it unlikely that encroachment will occur.

Commercial land uses are projected to mirror residential land uses. Increases in retail and services sectors are closely tied to area population growth. Development of any type is certain to generate new commercial activity.

Parks, Recreation and Conservation uses are expected to increase primarily in Columbia and Richmond Counties. Both counties have adopted ambitious greenspace plans and resident support for this land use remains high.

Agricultural and forestry uses are projected to decline region-wide. The most dramatic decline will occur in Columbia County, which is projected to undergo a very high rate of residential growth. Approximately half the county's agricultural and forestry uses (identified as undeveloped in the current land use table) is projected to be converted to residential uses in the future.

Taking a closer look at the area adjacent to Fort Gordon, Map_21 provides a view of land use within a 1-mile radius of the installation. The most noticeable change is the shift from undeveloped to residential land uses in Columbia County east of the installation. The area to the northeast of Fort Gordon, around the Grovetown area, is poised to enjoy significant population growth through the next two decades. The near-term market demand for real estate around that area is for suburban-style residential development.

These growth trends do not raise compatibility issues with post operations in the foreseeable future as the spread population south is not anticipated to enter NZ I and NZ 2 (Map_22).

Lands to the south and southwest are projected to remain primarily agricultural and forestry. Jefferson and McDuffie Counties do not, at present, pose a potential risk in terms of encroachment to Fort Gordon. Current agricultural and mining operations are profitable and it is unlikely that owners of these vast tracts of land will sell to developers. Heavy investment of existing city centers (Louisville, Wrens and Thomson) by local governments indicate a growth strategy based on existing utilities and transportation infrastructure. Furthermore, population projections indicate very limited growth for these counties. The few developed uses in the study area are residential. Residential uses are very low density due to low demand and the lack of municipal water or sewer services. Only a major increase in land values in Richmond and Columbia Counties has the potential to encourage residential development in these areas. Even then, the inability of the county government to provide capital improvements will discourage development.

Current population in the eastern part of Fort Gordon in Richmond County has increased substantially since 1990. The future land use map includes growth areas away from both Noise Zones I and II. Should this trend hold, encroachment will not become an issue. There is currently little pressure to develop in these areas.

2.5.1 Infrastructure

Infrastructure, zoning and environmental features are important determinants of growth and can serve to induce or constrain development.

The study area's street and highway networks have been significantly enhanced in recent years through a combination of Georgia Department of Transportation investment and a

special 1% local option sales tax that began in the early 1990s. Local funds have been used to widen several major roadways, including Riverwtach Parkway, Tobacco Road and Windsor Springs Road in Richmond County and Washington Road in Columbia County. Many other local arterial roads, such as Wheeler Road, Milledgeville Road and Boy Scout Road have been greatly improved for traffic and safety by adding shoulders, sidewalks, drainage facilities, and repaving. This type of local investment in roadways away from Fort Gordon is a good indicator of where the counties are responding to growth.

There are two ongoing major regional highway projects that may impact Fort Gordon. The Savannah River Parkway is a component of the Governor's Road Improvement Program (GRIP), conceived as an economic development project aimed at ensuring that most Georgia residents have access to a four-lane highway. Running along U.S. 25, the Parkway will connect Savannah to Augusta. US. 25 is considered a key project because of the multiple objectives it achieves. First, it will open up development in south Richmond County in areas that the local government considers desirable for growth. Second, because of its location 7-10 miles away from Fort Gordon, the project will encourage growth away from the installation. Finally, the four-lane highway can provide a direct transportation corridor between Fort Gordon and Fort Stewart and between Fort Gordon and other installations in Georgia and South Carolina.

The Fall Line Freeway is the other major GRIP project, aimed at linking Augusta, Macon, and Columbus. The benefit of inter-installation connectivity also applies to this project, as direct routes will be established between Fort Gordon and Georgia Air Force and Marine Corp bases. However the project also has the potential to encourage development near the installation and falls within Noise Zones I and II. Under current local plans to encourage development away from this area, combined with the relatively low projected growth, the Fall Line project may not result in encroachment pressures if managed properly.

Table 22 presents the 7 major planned projects included in the 2004 Georgia Department of Transportation STIP. All projects involve widening existing roadways in already developed areas. None of these projects are located within a 1-mile radius of Fort Gordon (Map_23) and are not likely to encourage development near the installation.

Table 22: Planned Transportation Projects

Project #	Description
P.I. #0000766	I-20 Upgrades at SR47, SR388, Columbia and SR150 McDuffie County Interchange, $11,400,000, 7.02 miles
P.I. #210450	I-20 at I-520 Interchange Reconstruction and Interchange, Richmond County $26,399,000, 1.2 miles
P.I.# 210570	(I-20 Widening from Belair Road/Columbia County to Riverwatch Pkwy/Richmond County), $31,307,000, 6.48 miles.
P.I. #222110	Widening SR121/US25 FM CR 438/Burke County to SR88 in Richmond County, $27,864,000, 10.11 miles.
P.I. #245320	Widening Windsor Springs Road/CR65 FM SR 88/Hephzibah to Willis Forman in Richmond County, $7,186,000, 2.2 miles

Project #	Description
P.I. #250510	Widening Wrightsboro Road/CR 1501 FM Jimmy Dyess Pkwy to I-520 Ramps, $5,400,000, 2.4 miles.
P.I. #250610	Widening Windsor Springs Road/CR65 FM Willis Forman RD to Tobacco Road, $9,325,000, 2.7 miles

Source: Georgia Department of Transportation Statewide Transportation Improvement Program (2004-2006)

All study area jurisdictions except Jefferson County provide public utilities. Utility service areas in Columbia, McDuffie and Richmond Counties generally include a concentration of water and sewer lines in heavily populated areas with sporadic lines further out. Water lines are more common outside urban areas and are found along most arterials in all service areas. Sewer line coverage is very limited outside urban areas.

Very limited utilities are provided within a 1-mile radius of Fort Gordon. Water lines have been added along U.S. 1 north of Blythe but sewer lines have not been extended that far south. In Columbia County, there is concentrated utilities coverage in Grovetown while in McDuffie County, utilities have not been provided in proximity to the Fort.

A review of local utilities Capital Improvement Plans (CIP) provides a good indication of where more intense development is likely to occur. According to CIP's, local governments have no plans to provide utilities to impacted areas. The Richmond County plan calls for improvements within the existing urban areas in addition to less urban areas away from Fort Gordon. In Columbia County, all utilities expansion is planned westward while McDuffie County will concentrate utilities in the Dearing area.

In terms of noise zones, there are currently no sewer lines within Noise Zone I or II. There is one water line within Noise Zone I but none within Noise Zone II. Under current capital improvement plans, this will not change.

The provision, extension, and maintenance of utility services are an expensive undertaking and planned improvement projects are perhaps the best indicator of future development. The lack of any existing or planned projects (due to the lack of client demand) within Fort Gordon's critical training areas will limit population growth and densities.

2.5.2 Zoning

Local zoning regulations are the primary tools local governments have at their disposal to direct land development in a desirable fashion. Accordingly, these regulations have a significant impact on development patterns in the study area. Zoning regulations determine the type of use that may be constructed on a property and specify other design standards, such as development density, building height and size, and setbacks from property lines.

All jurisdictions within the study area have adopted zoning regulations that specifically address land use and zoning issues within the study area. Zoning districts in the Jefferson and McDuffie Counties are typical of rural jurisdictions where codes include a small number

of general uses. Both counties, for example, use limited types of residential zoning or a combined residential/agricultural zone. In Columbia and Richmond Counties, zoning codes are more detailed, reflecting the various components of land use. Both counties have multiple residential districts, ranging from low-density rural residential zones to higher density multi-family districts.

As shown in Map_24, zoning districts within the study area vary. Both Columbia and Jefferson Counties have zoned the areas closest to Fort Gordon as mixed agricultural and very low-density rural residential (R-A) because intensive land development is not desired due to limited ability to provide public services and facilities. The minimum lot size in the R-A district is 2½ acres in Columbia County and 1 acre in Jefferson County and permitted uses are limited to residential and agricultural uses.

In McDuffie County, the area around Fort Gordon is zoned low-density residential. Currently, minimum lot sizes are 1 acre but the county is in the process of updating the zoning ordinance and is considering 5-acre lot sizes.

Richmond County displays more diverse zoning patterns. Most of the area around Fort Gordon, including within Noise Zone I and II, are zoned agricultural. Some low-density and commercial districts are located further north. Residential areas closest to the Fort require minimum 15,000 square foot lots.

Mobile homes are permitted in residential-agricultural and residential districts and are subject to similar lot requirements noted above.

2.5.3 Environmental Constraints

Environmental constraints provide indicators as to future development patterns. Significant floodplains, wetland areas, constrained soils, and prime farmland, present significant development costs. These conditions will most likely inhibit development investment, given the current availability of low cost and relatively unconstrained vacant land elsewhere in the region. Environmental constraints provide a significant benefit for Fort Gordon, as they create substantial land areas where noise impacts can occur without complaints from residents.

Floodplains

Flood plains are relatively flat lands that border streams and rivers that are normally dry, but are covered with water during floods. Flooding occurs when the volume of water exceeds the ability of a water body (stream, river, or lake) to contain it within its normal banks. The severity of a flood is usually measured in terms of loss to human life or property, which is directly proportional to the amount of development in the flood plain surrounding the stream or river.

Floodplains serve three major purposes: natural water storage and conveyance, water quality maintenance, and groundwater recharge. These three purposes are greatly inhibited when floodplains are misused or abused through improper and unsuitable land development. For example, if floodplains are filled in order to construct a building, then valuable water storage areas and recharge areas are lost. This causes unnecessary flooding in previously dry areas and can damage buildings or other structures. Therefore, floodplain development is usually discouraged.

The Federal Emergency Management Agency (FEMA) maps floodplains based on the frequency of flooding. Areas that are inundated by floodwaters, on average at least once in every 100 years, are defined as "areas of special flood hazard." Development within these areas are generally subject to special restrictions, due to the potential threat of flooding and the impacts that construction activities could have on the flow of floodwaters through the floodplain during periods of heavy flooding.

Study area jurisdictions regulate development in floodplains through land development codes, including limiting permissible land uses. While they vary from jurisdiction to jurisdiction, governments try to discourage sprawling residential development within floodplains.

The boundaries of all 100-year flood hazard areas in the 2004 JLUS study area are shown on (Map_25). Floodplains surround Fort Gordon, with concentrations to the south and west. Both Noise Zones I and II contain significant floodplains, rendering intense land development unlikely.

Wetlands

Federal law defines freshwater wetlands as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas.

Preservation of wetlands is vital because of the many important functions they serve. They are among the worlds most biologically productive ecosystems and serve as crucial habitats for wildlife. Wetlands can help maintain water quality or improve degraded water by performing functions similar to a waste-water treatment plant, filtering sediment, toxic substances and nutrients. Wetland vegetation filters and retains sediments which otherwise enter lakes, streams and reservoirs often necessitating costly maintenance dredging activities. Wetlands are also important to flood protection, as they act as water storage areas, significantly reducing peak flows downstream, and the meandering nature of wetlands combined with abundant vegetation reduce flood velocities.

Wetlands represent a significant constraint to development, due to the presence of a high water table and the important ecological role they serve as receiving and storage areas for

floodwaters and as wildlife habitat areas. The Georgia Planning Act of 1989 requires all local governments to identify wetland areas in their comprehensive plans and to consider specific protection measures recommended in the Rules for Environmental Planning Criteria developed by the Department of Natural Resources (DNR). The current local plans for all four-study area governments call for the adoption of the protection measures recommended by DNR. Development within wetland areas also is subject to review by the U.S. Army Corps of Engineers under Section 404 of the Clean Water Act.

The Rules for Environmental Planning Criteria list several acceptable and unacceptable land uses for wetland areas. Unacceptable uses include hazardous waste receiving areas and hazardous or solid waste landfills. Acceptable uses include forestry, wildlife and fisheries management, wastewater treatment, recreation, and natural water quality treatment or purification. Local governments must determine which additional uses may be allowed in wetland areas. Although wetland regulations in the study area communities do not restrict development activities to the same extent as floodplains, lands with extensive wetland areas are developed at a much lower intensity.

As indicated in Map_26, wetlands are prevalent along areas to the southeast and southwest of Fort Gordon. Some wetlands are found in the Richmond County portion of Noise Zone II.

Soils

Soils are also a major determinant of development. Although floodplain and wetland soils are clear development constraints, many other soil types can impose limitations on development activities. These soils include shallow to bedrock soils, excessively drained soils, and soils with low groundwater potential.

Map_27 includes soil surveys with data obtained from the U.S. Department of Agriculture Soil Conservation Service. Constrained soils constitute the largest amount of land within the undeveloped portion of the study area. Identified soils include Organgeburg-Faceville-Lucy and Wagram-Troup-Norfolk associations. These areas are generally not considered suitable for intensive development.

Land development and engineering can mitigate soil constraints but mitigation costs can be extensive. The availability of land with fewer constraints elsewhere in the counties render it unlikely that significant development will occur in those areas.

2.6 Future Fort Gordon Land Use

Future missions at Fort Gordon have the potential to impact land use both within the installation and in adjacent jurisdictions. For example, the decisions to allow a new type of training on-post could result in changes to existing training areas, which in turn can affect existing recreation areas. Conversely, such a change can result in expansion of noise

contours off-post and, if used intensively enough, can result in the introduction of air safety zones.

Determining the land use impact of future missions is difficult because the decision on future missions ultimately lies with Army Command. At present, there are no known plans to increase operations at Fort Gordon. Most of the proposed improvements on-post will not affect land uses in adjacent communities. However, there are a number of indicators that permit an assessment of possible future land use impacts.

2.6.1 Modularity and the Base Realignment and Closure Process

The Army is promoting the concept of modularity, which seeks to convert large units attached to Divisions into smaller stand-alone units that can deploy rapidly to areas of conflict anywhere in the world. Under this concept, the Army would reorganize by shifting units and personnel from one installation to another, or by restructuring troops on a given installation to meet the modular design, or both. Modular reorganization of forces at Fort Gordon could result in more intensive use of installation training lands, the addition of an aviation component to support air activities, and an increase in the number of soldiers stationed at the post.

Under modularity, more units would train on the installation, producing more noise from small and large arms weapons firing. However, the proposed units would be lighter than current units, relying less on heavy armored assets. Thus, the addition of new training would not necessarily alter existing noise contours, but additional range capacity would allow for a higher throughput of training units, therefore increasing the intensity and frequency of range use.

BRAC 2005 is expected to reduce up to 25% of installation capacity. With the expected decline in installations and the emphasis on stand-alone units, more soldiers could be assigned to the post. Increased personnel would likely place higher demands on training areas and the cantonment area.

Most of Fort Gordon's land is used for training. This high-use ratio, when combined with less than 12% on-post restricted lands due to environmental constraints, provides significant room for more intense use of current land. Because of the size of Fort Gordon, the installation is not well positioned for major maneuver units. A reasonable full use scenario would therefore include more intense use of existing training and facilities.

2.6.2 Real Property Master Plan Opportunities and Constraints

The Fort Gordon Real Property Master Plan offers a view of Fort Gordon's development potential. The plan identifies the following constraints and opportunities:

Constraints

- Steep sloped, wooded ravines that surround the plateau holding the cantonment.
- Existing World War II buildings that, because of their current usefulness and long-range scheduled demolition, prohibit immediate or near term new construction on their sites.
- Land use limited by landfills in key locations of the cantonment.

Opportunities

- Flat open spaces in expansion and development areas.
- Land holding "existing, not to be retained buildings," will be cleared and become available for future development.
- Unrestricted road and rail access and egress.
- A well planned installation that encourages equally good planning.
- Existing infrastructure networks throughout the installation.

The plan identifies Fort Gordon as "a well planned installation that encourages equally good planning". Its also identifies the development potential that exists for land immediately adjacent to the main cantonment area. Although the plan does not call for significant land use changes to the Signal, Troop Housing, Hospital, and Administration and Community Center Areas (projects will expand and improve the efficiency and productivity), it does recognize that capacity exists for such development.

Limitations to on-post development are primarily a result of geographical location of the built-up areas of the main cantonment area. Site limitations include floodplains, natural vegetation areas, active and inactive landfills, safety zones for ammunition storage, and high noise areas.

2.6.3 Future Noise Environment

The Fort Gordon noise environment is not expected to change substantially in the near future. Like all Army training installations, however, expanded test and training footprints that result from modern weaponry may extend and expand current noise contours.

2.7 Other Planning Issues

2.7.1 Natural and Environmental Resources

The study area is situated in three major land resource areas: the Southern Piedmont, the Carolina and Georgia Sand Hills, and the Southern Coastal Plain. The Southern Piedmont covers the extreme northern part of the study area and consists of broad to narrow ridgetops and long irregular hillsides bisected by numerous small winding drainageways. The Carolina

and Georgia Sand Hills are located in the northern and western parts of the study area and separate the Southern Piedmont from the Southern Coastal Plain. The Southern Coastal Plain covers the southern and southeastern parts of the study area and is characterized by broad ridgetops and hillsides extending to drainageways.

Approximately 32 species of mammals, 136 species of birds, and 67 species of reptiles and amphibians inhabit the Coastal Plain/Piedmont region, dispersed throughout the installation and adjacent local communities. Common mammal species include:

- White-tailed deer (Odocoileus virginianus)
- Fox and gray squirrel (Sciurus niger and S. carolinensis)
- Gray fox (Urocyon cinereoargenteus)
- Red fox (Vulpes vulpes)
- Raccoon (Procyon lotor)
- Striped skunk (Mehpitis mephitis)
- Coyote (Canis latrans).

Common bird species and reptile/amphibian species include:

- Northern bobwhite (Colinus virginianus)
- Turkey vulture (Cathartes aura)
- Pileated woodpecker (Dryocopus pileatus)
- Northern mockingbird (Mimus plyglottos)
- Red-eyed vireo (Vireo olivaceus)
- Tufted titmouse (Parus biocolor)
- Carolina chickadee (Parus carolinensis).
- Eastern mud turtle (Kinosternon subrubrum subrubrum)
- Eastern box turtle (Terrapene carolina carolina)
- Southern fence lizard (Sceloponts undulatus undulatus)
- Brown water snake (Nerodia taxispilota)
- Eastern kingsnake (Lampropeltis getula getula).

Endangered, threatened, and rare animal species known to reside or occur in the study area include the Red-cockaded Woodpecker (RCW), Bald Eagle, Wood Stork, Southeastern Bat, Rafinesque's Big-eared Bat, Bachman's Sparrow, Southeastern American Kestrel, Loggerhead Shrike, Gopher Tortoise, Southern Hognose Snake, and the Florida Pine Snake (Map_28). Various other rare animal species may potentially reside in the area, including the Eastern Indigo Snake, American Alligator, Carolina Gopher Frog, Mud Sunfish, Blackbanded Sunfish, Savannah Darter, Smallfin Redhorse, Sailfin Shiner, and Eastern Mudminnow.

Fort Gordon has prepared a Red-Cockaded Woodpecker Endangered Species Management Plan. The objective of the ESMP is to conserve the RCW as required by the Endangered Species Act (1973) while preserving training readiness and other mission requirements. Active management for RCW, including midstory reduction and cavity protection, began in

1988. In 1993, installation managers initiated a nest box program for the Southeastern American kestrel (*Falco sparverius paulus*).

According to the Fort Gordon Natural Resource Management Plan, the adverse impacts of the military mission upon the natural communities at Fort Gordon have been minimal. Fort Gordon units prefer open spaces for training and regularly return to previously used sites. Small arms training is restricted to ranges along the perimeter of a 7,500-acre impact area. Artillery training is infrequent; a 5,200-acre impact area serves this need with firing points scattered throughout the installation. Range control regulations restrict vehicles to established roads, trails, and firebreaks, which minimizes damage to plant and animal habitat.

Fort Gordon and the surrounding communities form a core habitat area for many species of plants and animals. Due to the lack of development near the installation's critical areas, Fort Gordon has remained an intact, quality habitat and has avoided fragmentation and reduction of environmentally sensitive resources resulting from the forced migration of wildlife species dispossessed by development. Species are not drawn to on-post habitats and the Fort avoids triggering federal protections that restrict the use of installation lands for training purposes.

Noise affects wildlife differently from humans and the effects of noise on wildlife vary from serious to nonexistent in different species and situations. Risk of hearing damage in wildlife is probably greater from exposure to nearby blast noise from bombs and large weapons than from long-lasting exposure to continuous noise or from muzzle blast of small arms fire. Direct physiological effects of noise on wildlife, if present, are difficult to measure in the field; telemetric measurement of physiological variables such as heart rate has met with more success technically than as an indicator of health and survival. Behavioral effects that might decrease chances of surviving and reproducing include retreat from favorable habitat near noise sources and reduction of time spent feeding with resulting energy depletion. Serious effects such as decreased reproductive success have been documented in some studies and documented to be lacking in other studies on other species.

Species are limited to existing management practices as identified in the INRMP and Biological Opinion. No critical habitat has been designated on Fort Gordon and area wildlife habitats and patterns have not been altered due to development.

2.7.2 Water Quality

The RPMP found that overall, water quality at Fort Gordon is acceptable but that encroachment could threaten the long-range viability of the water supply. Specifically, as a result of construction of the Dyess Parkway connecting I-20 and Fort Gordon's Gate 1, development within the Butler Creek Watershed is expected to progress rapidly.

The watershed suffers from non-point source pollution caused by urban stormwater and agricultural runoff, and point source pollution from wastewater treatment plant and industrial releases. Pollution has affected water quality and reduced the natural biodiversity and productivity of the system. Storm runoff can be a major contributor to water quality

imbalance due to suspended sediment that is carried into streams, impoundments, and estuaries.

To protect Fort Gordon's potable water supply, Butler Reservoir, the Fort Gordon Environmental Branch has created a Watershed Protection Plan for Butler Creek, its tributaries and Butler Reservoir. The Butler Water Supply Reservoir Management Plan was prepared in accordance with the Georgia Environmental Protection Division (EPD) Rules for Environmental Planning 391-3-16.01, Criteria for Water Supply Watersheds. The implementation of the Plan would aid in compliance with the 1996 Safe Drinking Water Act Amendments for Source Watershed Protection and protect the Fort's water supply.

Butler Creek Watershed covers approximately 8,640 acres in Augusta-Richmond and Columbia Counties and the City of Grovetown. Fort Gordon maintains approximately 5-10% of the watershed with the remainder managed by the state (DOT), local governments and private landowners. Fort Gordon has approached the surrounding local governments to create a Butler Creek Watershed Committee to implement the plan.

The plan's implementation will protect the reservoir through use of access and buffer management. The plan establishes the minimum requirements for protecting the water supply, including limitations on public access, recreational activities, septic tanks, as well as a series of buffer zones co-managed by various Fort Gordon Directorates and adjacent local governments.

2.7.3 Fire Management

Prescribed fire management is a tool used to reduce forest fuels that could generate a high intensity fire and destroy natural resources. Wildfires frequently occur throughout the year as a result of tracer rounds and other munitions that are fired into this impact area. Fuel reduction burns are generally conducted during the dormant season (winter) when temperatures are low and the weather is more predictable and to minimize damage to desirable vegetation. However, natural fires in the longleaf pine community are believed to have occurred during the spring and summer months (growing season).

The issue related to prescribed burning is similar to noise in that a concentration of high-density population may be annoyed. Burning occurs at every large installation in the southeast and on almost every military installation that has large land areas to manage throughout the nation.

2.7.4 Transportation Issues

Roadways at Fort Gordon are laid-out in a grid pattern with east-west/north-south axes. The majority of streets in the cantonment area are oriented with this pattern. The primary exception to the grid is Avenue of the States and those roadways that are parallel, which

follow a northwest/southeast diagonal linking Gate 5 with the center of the cantonment area.

Two other primary thoroughfares also serve the cantonment. Chamberlain and Lane Avenues follow an east-west pattern. Chamberlain Avenue runs from Gate 1 past the medical center and continues west into the maintenance area of the installation. Lane Avenue begins at the five-point intersection and runs west and south.

The primary thoroughfares used to approach and access Fort Gordon are US Routes 78/278 (Gordon Highway) and U.S 1. Gordon Highway parallels the northerly boundary of the installation and provides access via Gates 1, 2, and 3. U.S. 1 parallels the southerly boundary and provides access to the post through Gate 5.

As Table 23 demonstrates, roadways that connect with Fort Gordon's internal road network, as well as other major roadways, provide an overall good Level of Service (LOS). LOS is a measure describing operational conditions of a roadway in terms of average speed, travel time, maneuverability, and traffic interruptions. The measure contains 6 LOS categories, ranging from A to F, each describing the operating conditions associated with them:

- A - Free flow, minimum delay at signalized intersections.
- B - Occasional short delays that may require waiting through one red light.
- C - Stable flow with intermittent delays at signalized intersections (typical design level). Backups may develop behind turning vehicles.
- D - Approaching unstable flow and may require waiting through two or more red lights.
- E - Unstable flow. Roadway is operating at capacity with high levels of congestion that may result in lengthy delays.
- F - Forced flow through jammed intersections. Excessive delays resulting in extremely high levels of congestion

The LOS indicates roadway conditions during the peak hour of traffic. It is calculated by determining the ratio of traffic volume to roadway capacity for segments of individual roadways based on accumulated flow from collector roads within the traffic shed. The typical design level of a road represents an operational LOS C. This indicates that roads are designed to adequately handle 65% of the traffic capacity while maintaining a stable flow of traffic. The lack of LOS E or F near the Fort indicates effective circulation. This contributes to mitigating encroachment pressures by making it practical for residents to live further away from Fort Gordon without the worry of congested roadways.

Table 23: LOS Ratings for Highways Around Fort Gordon

LOS Ratings	Total Traffic	Rating
US1	7,387-28,437	D
US78	6,852	D

LOS Ratings	Total Traffic	Rating
US221	1,919-4,171	C or better
SR88	7,644	C or better
SR383	8,542	C or better
SR223	2,988	C or better
I-20	47,616	D
I-520	50,000+	D

Source: Augusta-Richmond County Planning & Zoning; Georgia Department of Transportation

3.0 Review of Efforts to Prevent Encroachment in other Communities

To protect the missions of military installations, communities have taken steps to address encroachment. Broadly, these include:

- Drafting state legislation that mandates compatible land use
- Enacting local zoning, planning, and noise requirements
- Using existing statutory authority to designate land around military installations as areas of critical state concern
- Acquiring property around military installations
- Creating state military advisory bodies
- Participating in conservation partnerships

3.0.1 Mandating Land Use Compatibility

Many states, including Arizona, California, Colorado, and Oklahoma, have passed legislation that regulates land use compatibility around military installations.

Arizona has enacted a series of laws that require compatible land use around its five military airports. Beyond opportunities for military installations to be consulted on surrounding land use changes, these laws require new development adhere to stringent planning, zoning, and noise requirements. Local governments adjacent to a military airport are required to submit biyearly reports demonstrating compliance.

The encroachment statute prohibits residential and other sensitive land uses in areas surrounding military airports and requires the adoption of land-use plans and zoning regulations that are compatible with the high noise and accident potential generated by military operations. For example, the act mandates that sound attenuation standards be incorporated into all local building codes and requires that developers provide proper and timely notice of noise-sensitive uses to prospective buyers.

In California, state statues require local governments consider the impact of new growth on military installations when preparing zoning ordinances or designating land uses that are covered by the general plan for lands adjacent to military facilities.

In Oklahoma, where encroachment has resulted in the abandonment of critical fire ranges at Fort Still, the state enacted a law that restricts the use of property within five miles of a military installation that may be hazardous to aircraft operations. Under the statute, prohibited or restricted land uses include the release into the air of any substance that would impair visibility, the production of light emissions that would interfere with pilot vision, activities that attract birds or waterfowl, and construction of any structure located within 10 feet of aircraft approach or departure. Residential development is limited to single-family use on tracts of one acre or more.

Other states have enacted laws that aim to address potential land-use conflicts between communities and nearby installations before the zoning regulations or land-use restrictions are implemented. In Georgia, a law was recently passed mandating local communities coordinate with their adjacent installations in considering the impact of zoning decisions on military operations. The law requires that a local planning department solicit a written recommendation from a military base's commanding officer when there is a proposed change in zoning of property that is within 3,000 feet of any military installation. This provides an opportunity for the local military base to offer a recommendation regarding the proposed land use or zoning change and allows them to explain whether or not the proposed change will have a negative impact on the base's operations.

In Washington, military installations must be notified of a local government's intent to amend its comprehensive plan or development regulations and provided the opportunity to submit written comments.

Virginia and Florida require that the commander of any military installation be notified in advance of a public hearing on proposed land-use changes. The law provides the commander the opportunity to submit comments or recommendations to proposed changes of local comprehensive plans, zoning maps, or special exceptions involving any parcel of land located within a boundary of a military installation.

3.0.2 Enacting Local Zoning, Planning, and Noise Requirements

Several local governments in Florida are addressing encroachment in their land-use codes. Escambia County, home to Pensacola Naval Air Station, has a land development code that creates various levels of accident potential and noise zones. The code sets forth specific compatible land uses for each zone.

In Virginia, the city of Virginia Beach, home to Oceana Naval Air Station, has adopted a zoning code that limits land uses that are incompatible with airport noise and aircraft accident potential zones. Another approach Virginia has taken to address encroachment concerns is to provide disclosure of aircraft noise and accident potential to both prospective buyers and sellers of land near a military installation.

In Maryland, local legislation in St. Mary's County imposed development restrictions to protect air space around Patuxent River Naval Air Station. The provisions of the Air Installation Compatible Use Zone (AICUZ) study established two sub-zones, based on accident and noise potential where factors such as development density and height are regulated.

3.0.3 Designation of Areas of Critical Concern

Several states have existing statutory authority to protect areas of statewide importance. Development within "areas of critical state concern" (ACSC) is monitored by local

governments and/or state agencies to ensure compatibility. In most cases, local governments draft plans that are consistent with the state plan and then apply to a state land development agency for permission to develop within those areas. The majority of the lands protected under ACSC statutes are environmentally sensitive regions such as wetlands, aquatic preserves, and wilderness areas.

Florida's land development code requires local government codes be consistent with state development and land use policies. In addition, the Environmental Land and Water Management Act requires state approval of major development proposals. This statute permits the governor and cabinet to designate up to five percent of state land as ACSC, which prevents unsuitable development that would endanger resources of regional or statewide significance. The state has the authority to review and revise local government comprehensive plans and land development regulations to ensure that critical state land is adequately protected.

The Colorado Land Use Act encourages local governments to designate "areas and activities of state interest" that include "areas around key facilities in which development may have a material effect upon the key facility or the surrounding community." The act defines a key facility as a military installation or major infrastructure and utility facility. The act also specifically discourages the development of housing that would be subject to high noise levels or the potential of danger due to aircraft accidents.

Maryland defines an ACSC as a specific geographic area of the State which, based on studies of physical, social, economic, and governmental conditions and trends, is demonstrated to be so unusual or significant to the State that the Secretary designates it for special management attention to assure the preservation, conservation, or utilization of its special values.

Wyoming's Land Use Planning Act empowers the state land-use commission to define and establish guidelines to protect areas that are of "critical or more-than-local concern." The commission also assists local governments with the planning and regulation of development in these areas.

3.0.4 Land Acquisition

Political jurisdictions at various levels and in many states have initiated programs to acquire property surrounding a military installation through fee-simple purchase, transfer of development rights, purchase of development rights, and density transfers.

Florida instituted the Defense Infrastructure Grant Program to improve military base infrastructure and to provide dual-use benefits to local communities. In addition, Florida is acquiring land around military bases through Florida Forever, a 10-year, $3 billion land conservation program. The state has invested $683 million to acquire nearly 500,000 acres of land buffering military installations across the state to protect natural resources and benefit military operations.

Oklahoma voters approved a $50-million bond measure to purchase private property around Tinker Air Force Base to expand the runways' safe zone.

In Arizona, a coalition of public and private groups supporting communities impacted by the state's major military installations worked to pass legislation that would provide funding to purchase land around the state's bases. Approximately $5 million annually has been set aside for the program. At a local level, Pima County voters approved a bond initiative to prevent urban encroachment at Davis-Monthan Air Force Base by allotting $10 million to buy land near the installation.

Texas ratified a constitutional amendment approved by the legislature that authorizes the state to establish a revolving loan fund and issue up to $250 million in general obligation bonds to help defense communities enhance the value of their military installations and promote compatible land use. Under the law, a community near a defense installation may request financial assistance to prepare a comprehensive defense installation and community strategic impact plan which sets forth the communities' long-range goals and development proposals.

3.0.5 Creation of State Military Advisory Bodies

Many states have established military advisory bodies to protect state military installations from closure, most immediately under the next round of Base Realignment and Closure (BRAC) currently scheduled for 2005. These bodies facilitate discussions among stakeholders, such as the executive branch, the state legislature, congressional representatives, local and county governments, military base commanders, business interests, and landowners. Preventing incompatible encroachment around military bases is a priority because encroachment will be assessed as a component of military value under the BRAC criteria.

Arizona established a Military Affairs Commission charged with monitoring developments regarding the state's military installations and to make recommendations on executive, legislative, and federal actions necessary to sustain and expand those installations. In addition, the Southern Arizona Military Airspace Working Group, composed of local and state airport and transportation officials, provides a single point of contact for coordination on military issues arising from the development of civilian airports and military operations affecting civilian airports.

In Florida, the Florida Defense Alliance oversees the Defense Infrastructure Grant Program, which provides funds to purchase land surrounding military installations to curb encroachment.

The Georgia Military Affairs Coordinating Committee (GMACC) works to improve the mission value of the state's federal military installations and the quality of life of the people who live and work there. During the past two years, it has conducted an evaluation of each

base and developed a comprehensive action plan to address any shortcomings. The plan is reviewed semiannually and continually adjusted as issues are resolved or new issues surface.

3.0.6 Federal and Non-Profit Partnerships

The purchase of easements is a common tool for preventing certain kinds of development on parcels of land. An easement is a legal agreement that can be used to permanently restrict the development or use of land. The Air Force's land acquisition plan for Luke Air Force Base will compensate nearly 50 landowners for easements that allow the continued use of their property for agriculture as long as it is compatible with the base's mission. Landowners will continue to own the land, and when it is sold or transferred, the new property owner will be subject to the same restrictions. The Air Force will spend an additional $6 million to purchase 273 acres around the Luke Air Force Base munitions storage area to secure transport of live ordnance.

Nevada has also received approximately $40 million in federal funds that they have used to acquire 413 acres around Nellis Air Force Base. States can also receive federal assistance under the Farmland Protection Act to pay farmers for development rights to ensure that uses remain agricultural and prevent encroachment of nearby military installations.

Another option available to facilitate the acquisition of land around a base is to establish a partnership between a military installation and state/local government or conservation group. The National Defense Authorization Act allows the Secretary of Defense to enter into agreements with a state, local government, or land preservation group to acquire or accept, on a cost-shared basis, property around a military installation to address the use or development of real property that would be incompatible with the mission of the installation.

Florida was the first state to take advantage of this law. In 2003, a cooperative agreement between the State and the Army National Guard was signed to purchase property surrounding Camp Blanding Training Center. The total cost for the 8,737 acres is approximately $13 million – the state will contribute $12.5 million and the remaining $500,000 will be federally funded.

Partnerships between an installation and a conservation group can achieve great success because they often result in a win-win situation. For instance, many conservation groups aim to protect the natural habitat of endangered species. Military bases want adjacent lands to remain undeveloped for security and safety purposes. If a base and a conservation group partner to acquire land around a military installation, both groups benefit because the land is protected for conservation purposes and the military base is protected from incompatible development.

In 2003, the Department of Defense and Florida signed an agreement aimed at protecting base operations as well as significant natural resources in northwest Florida. Working with the Nature Conservancy and many other groups, the Northwest Florida Greenway project

will create 100 miles of open space stretching from the Apalachicola National Forest and the waters of the Gulf of Mexico to Eglin Air Force Base.

Camp Ripley is working on a similar arrangement with the Minnesota Department of Natural Resources, The Nature Conservancy, and several other conservation groups to preserve a three-mile, 110,000-acre protective buffer around the installation. Landowners in the targeted area have been asked to voluntarily sell their property or the land's development rights in the form of a conservation easement, and to date 67 landowners with a total of 7,171 acres have expressed interest.

The partnership between North Carolina's Fort Bragg and the Nature Conservancy is another good example of a military installation partnering with a conservation groups. These two groups joined forces under the Private Lands Initiative program to purchase conservation easements on land surrounding Fort Bragg. The Nature Conservancy's goal is to protect the habitat of the red-cockaded woodpecker while Fort Bragg wants to prevent incompatible development to maintain its mission. Under this mutually beneficial agreement, the partnership owns the land and the Army manages it. To date, the Army has committed $9.4 million and The Nature Conservancy has pledged $7 million.

Other installations that have submitted applications with the Department of Defense to establish similar partnerships include Camp Pendleton in California, Fort Carson in Colorado, Fort Sill in Oklahoma, and Fort Lewis in Washington.

3.1 Compatibility Tools

The preceding discussion highlighted some of the efforts local communities have used to prevent encroachment. There are numerous other compatibility tools available to communities, some of them regulatory, others voluntary, some appropriate for local communities, others for military installations and the Army.

3.1.1 Regulatory Tools

Zoning

The most common land use control method is zoning. Zoning is an exercise of the police powers of state and local governments that designate the uses permitted on each parcel of land. It normally consists of a zoning ordinance that delineates the various use districts and includes a zoning map based on the land-use element of the community's comprehensive plan.

Zoning needs to be applied fairly and based on sound planning principles. Zoning ordinances generally implement provisions of a community's comprehensive plan, which must consider the total needs of the community along with specific needs of the installation. For example, to zone a parcel of land for industrial or agricultural use simply because it lies

within a noise impact area is not acceptable. Such an action could be considered arbitrary or unreasonable and thus vulnerable to judicial action. The plan must clearly demonstrate that there is a reasonable present or future need for such usage.

Zoning has several limitations that must be considered when using it as a compatibility implementation tool. These limitations include:

- Zoning is controversial: Zoning is inherently tied to property rights and places elected leadership in difficult position if residents feel property rights are being infringed.

- Zoning is not retroactive: Changing a zone primarily for the purpose of prohibiting a use that already exists is normally prohibited. However, if such zoning is accomplished, the use must be permitted to remain as a nonconforming element until landowners have had ample opportunity to recoup their investment.

- Zoning is jurisdiction-limited: Installation impacts often span more than one zoning jurisdiction. In this case, zoning requires coordination of all involved jurisdictions. Zoning that implements a compatibility plan will often be composed of existing and new zoning districts within each of the zoning jurisdictions covered by the plan. Each jurisdiction is likely to have a different base zoning ordinance with districts having different applicability for implementing the compatibility plan.

- Zoning is not permanent: In any jurisdiction, zoning can be changed by the current government body as it is not bound by prior zoning actions. Consequently, zoning that achieves compatibility is subject to continual pressure for change from both urban growth and interests that might profit from such changes.

Subdivision Regulations

Subdivision regulations are a means by which local government can ensure that proper lot layout, design, and improvements are included in new residential developments. These regulations set guidelines that developers must follow when constructing subdivisions. Examples include minimum requirements for road widths, lot arrangements, allocation of facilities, the relationship of the subdivision to the surrounding area, and the dedication of property. Subdivision regulations are used to ensure that the health and habitability of each new residential development is maintained.

Most subdivision regulations require some type of dedication of open space. In the context of land use compatibility, this provision would normally be structured such that the space is located nearest to a military installation. Noise barriers might also be erected along these buffer areas. Also, larger buffer areas could be required for subdivisions closer to the noise source.

Cluster subdivisions are usually intended to protect landscape features, such as water bodies, wetlands, wildlife habitat, scenic views, and historic sites. To ensure that this land use tool can effectively reduce future development impacts around installations, local governments would implement a special provision of cluster zoning that recognizes those portions of a parcel within a noise zone as prime candidates for the application of clustering. The site design would thus set aside areas subject to noise and safety constraints and allow denser, but compatible, development in areas outside of noise and burn zones. This approach is density neutral, meaning that it allows developers to build as many housing units as would otherwise be permitted under conventional zoning.

Subdivision regulations alone do not prevent incompatible development around or near an installation. They are used to diminish the impact of noise emanating from the installation. Buffers placed in the subdivision may not be adequate to reduce the noise levels, providing only partial noise reduction. Administrative responsibility for subdivision regulations would then increase because of the additional requirements for noise attenuation. Thus, the cost to both the local government and the homeowner would increase.

Building Codes

Building codes prescribe the basic requirements that regulate construction of structures. Building codes are adopted by local governing bodies to protect the health, safety, and general welfare of the occupants of these structures. The codes establish a set of requirements covering matters such as fire protection, building materials, lights, ventilation, exits, plumbing, and others. Although building codes cannot prevent development or ensure compatibility, they can contribute to minimizing noise effects. A code can require that walls, partitions, and floor-ceiling construction have minimum sound transmission capabilities. The codes can specify a certain sound transmission class (STC) that must be obtained. Specific construction techniques and materials can also be stated in codes.

Comprehensive Plans

Although comprehensive plans are not legally-binding under Georgia law, they are included under regulatory heading because severe pressures not to deviate from the comprehensive plan can come from residents. By their nature, comprehensive plans are stakeholder documents, a reaching of community consensus on such matters as land use and community facilities. Because the land use component requires a future land use map indicating areas of future growth, residents typically object when development patterns deviate from the plan.

Eminent Domain

Eminent domain is a police power that enables governments to condemn and subsequently acquire private property for public use. The public purchase clause is important in eminent domain proceedings. This clause allows local governments to use eminent domain for a

wide variety of acquisitions. Exercising eminent domain forces property owners to sell for just compensation, regardless of the owner's desires. The sale price is determined by independent appraisals, and if agreement cannot be reached, the courts will determine the compensation price.

Eminent domain can be used to create open space in a municipality. It is usually implemented as a last resort when property cannot be acquired or controlled by other methods. Property around an installation would be condemned and subsequently purchased. By paying for the property, local governments or an installation would receive clear title to it and thus control all rights.

Like other regulatory acquisition methods, eminent domain proceedings often result in litigation. As a result, acquisition of the property may take years, if it occurs at all.

Deed/Covenants

A deed is the document conveying ownership of land from one party to another. Restrictions (known as covenants) can be added to become an integral part of the deed. Such covenants specify the uses which new owners may make of the land. Deed restrictions apply in addition to any zoning laws and, in some cases, supersede zoning by prohibiting a specified use that might otherwise be legal from a zoning standpoint. Restrictive covenants are known technically as "running with the land". That is, restrictions remain in effect no matter how often the land is subsequently resold. In certain instances, restrictions that have become impractical can be legally removed by the landowners if deemed justifiable by the courts.

For deed restrictions to be an effective compatibility tool, a local government or installation must first own or acquire the property. In later reselling the property, agents can specify which uses will be permitted on the land. Incompatible land uses can therefore be prevented for as long as the restrictions remain in effect. This method is particularly useful in controlling development on the property most vulnerable to installation noise.

The main benefit of this control over surrounding land uses is retained without the need to continue ownership of the land. The disadvantage is that it removes taxable property for local governments and the placing of land use restrictions in the deed might hinder attempts to sell the land later.

Easements

An easement is a right of another to part of the total benefits of the real property owner. Ownership of property includes possession of a series of rights to the use of that property. The state or the general public always retains certain rights to the property while other rights are retained by neighboring property owners (i.e., the flow of water across land). Rights of ownership may be brought and sold separately. When property is acquired, usually all rights

are purchased. However, it is possible to buy only selected rights that are actually needed. These rights can be acquired in the form of easements, with other rights retained by the owner. The cost of an easement is determined by the value of those rights to the landowner. If the easement will not significantly impair the owner's contemplated usage or sale of the land, the cost is usually low.

There are two basic classes of easements - positive and negative. In positive easements, the right to use property (i.e., to build a road, install power lines, etc.) is acquired. In negative easements, the right to prevent the use of the property by its owner for certain activities is acquired. These easements may include the owner's rights to erect billboards, cut timber, build above certain elevation, or perhaps use the land for any noise-sensitive use.

For noise compatibility issues, both the positive easement to make noise over land and the negative easement to prevent the creation of an unprotected noise-sensitive use on the property can be acquired. In practical terms, this would include the purchase of all the property owner's rights to establish or maintain an unprotected noise-sensitive use on the property.

In the case of an existing unprotected noise-sensitive use, the cost of the easement could include the cost of either soundproofing or removing the noise-sensitive use from the property. A specific list of noise-sensitive uses, based on the criteria used for compatibility is typically specified as sound attenuation or other protection sufficient to place the noise-sensitive uses within the sound environment specified by the criteria.

Easements can be an effective and permanent form of land use control. Easements are permanent, with the title held by the purchaser until sold or released, and work equally well within different jurisdictions. They are directly enforceable through civil courts and may often be acquired for a fraction of the cost of the land value. Another consideration is that the land is left free for full development with noise-compatible uses.

The main disadvantage of this tool is the possible difficulty in obtaining the necessary easements, particularly when many landowners are involved, because the cooperation of many is required.

3.1.2 Voluntary Tools

Purchase Option

Under fee simple purchases, local governments or an installation can receive ownership of lands and may also assume management responsibilities. Once transferred, the property is no longer on the local government tax role. Communities typically finance programs through general obligation bonds.

Fee-simple purchase of noise-impacted land is the most positive form of land-use control but is also the most expensive. However, when combined with either resale for compatible

uses or retention and use for compatible purposes, the net cost may be reduced greatly. As a preventive measure, purchase should usually be limited to critical locations or in cases for which other solutions would not work.

An obvious positive feature of this method is that it permits local governments or an installation to gain complete control over the use of surrounding land. The main disadvantage is the initial cost of acquiring lands. The initial outlay may prove too expensive to justify the acquisition.

Purchase of Development Rights

With the purchase of development rights (PDR), land ownership remains private and landowners are compensated at a percentage of market value for continuing to use land for those activities that require minimal development and maintain consistency with installation operations. The purchase of development rights is roughly equal to the value of the land without any special restriction less the value of the land with the land use restrictions. A local government, installation or a partnering non-profit agency then holds the conservation easement, which restricts development on the land in perpetuity.

By purchasing development rights, land uses adjoining installations can be kept compatible thus achieving the goal of preventing development. A program of purchasing development rights could be used when insufficient funds are available for fee-simple purchases of land. The program would work best where development rights of agricultural land are purchased; land would remain productive and no incompatible uses would be developed.

Because it's voluntary, the main problem with PDR is unwilling sellers.

Transfer of Development Rights

Transfer of development rights (TDR) involves separate ownership and use of various rights associated with a parcel of land. Under the TDR concept, some of the property's developmental rights are transferred to a remote location where they may be used to intensify permitted development. For example, lands within an installation's noise-impacted area could be kept in open space or agricultural areas and their developmental rights for residential uses transferred to locations outside the area. Landowners would be compensated for the transferred rights by their sale at the new location or local governments and an installation could purchase the rights. The TDR approach must be fully coordinated with the community's planning and zoning office. It may be necessary for the zoning ordinance to be amended to permit TDR's.

TDR's are inexpensive or cost-free to an installation since the local governments would administer it. The program could also stimulate growth and development of the property to which developmental rights are being transferred. One potential problem with the method,

however, is record keeping. Because of the complexity of the transaction, it is often difficult to keep track of the principals and the exact number of rights that are purchased and sold.

Special Tax Treatment

Special or preferential tax assessment of land by a local government allows property owners to pay lower or no property tax. By taxing land differently, open space can be maintained. There are three primary methods of using taxes to keep space open. First, tax exemption of open property could be encouraged. Second, preferential assessment of land would allow agricultural or open land to be taxed at a substantially lower rate. Third, tax-deferral allows the owner of open property to forego property tax payments until a non-open space use is developed. Before such use is approved, however, all tax deferrals would have to be paid.

These methods are, again, a way of preventing development at no cost to an installation. The preservation of existing uses, especially agriculture, is promoted as well. Property that abuts open space will become more valuable through the amenity that open space provides. The added value translates into increased tax revenue for the local government.

A major drawback of this method is that the cost of the program must be absorbed by local governments, which may refuse to implement it for this reason.

Public/Private Leaseback

Leaseback is a financial arrangement in which land is acquired and controlled, but not necessarily occupied, by the owner. This method can be used by both the public and private sectors. The leaseback arrangement in the private sector requires two simultaneous steps. First, an investor purchases real estate owned and used by a business firm or government. Second, the property is leased back to the firm or government by private persons for specific uses in accordance with the approved plan for the area. Customarily, the terms of the lease ranges from 20 to 40 years.

Leaseback offers a way for public agencies to acquire land, yet provide for the continued use of the land by others. Public agencies can thus limit the land use, while acquiring some income from the property. The leaseback method is popular in the private sector because it provides capital from outside sources and is a flexible form of financing.

Public agencies often have the usual landlord's management problems. The leaseback arrangement also keeps land off the tax roles when used by the public sector, which lowers revenue. Problems arise in the private sector when there is no repurchase option and the value of the property appreciates. Without this option, the lessee will not share in any value increases.

Sales Agreements

An essential ingredient in transferring real estate into a valuable commodity is the written agreement. A contract is a legally binding document in which certain parties agree to do or refrain from a given action. The sales agreement is a legal contract which can be enforced through the legal process by either of the parties if the other party does not willingly comply with contract terms.

A sales agreement is needed to establish the terms agreed upon by the seller and buyer. The buyer usually accepts the terms in the purchase agreement. Final acceptance of the purchase or sales agreement may be conditional upon proof of a clear title, rezoning to fit the land use plans of the buyer, or adequate financing from lenders. The minimum requirements for a sales contract are the parties' agreement to conditions of the sale, a description of the property, and signatures of the agreeing parties. An installation, through sales agreements, can restrict the use of surrounding lands if they own or control them. Of course, the buyer must accept the terms of the sales agreement.

After signing, the sales agreement is a legally binding contract. The buyer and/or seller can seek legal recourse through the courts if the contract is broken. Unlike the restrictive covenant, the sales agreement pertains only to the prospective buyer. The agreement does not carry over to future sales of the property unless so stated in the contract.

Option

An option is an agreement between the buyer and seller of a property. In the agreement, the seller will hold the property for a specified time. In turn, the buyer agrees to pay a sum of money as consideration for the offer. At the time the option is granted, no real property ownership rights pass. Instead, the buyer is purchasing the right to buy at a fixed price within a specified period of time. The seller retains the money paid regardless of whether the option is exercised. Option costs vary, but usually include the property taxes and a standard interest charge. The option can be used when funds cannot be acquired to purchase the property outright. During the period of the option, funds presumably can be obtained to make the purchase. This period can also be used to examine rezoning possibilities or other actions that would affect ownership of the property.

This technique requires expenditure of funds to purchase the option. Even more funds must be appropriated if the option is set up to be renewed continuously.

Conservation

Conservation refers to a series of tools designed to eliminate land use incompatibilities through voluntary transactions in the real estate market and the local development process. Conservation strategies are particularly effective because they advance the complementary

goals of shifting future growth away from an installation, while protecting the environment, maintaining agriculture, and conserving open spaces and rural character.

The Land and Water Conservation Fund (LWCF) was established by Congress in 1964 to create parks and open spaces, protect wilderness, wetlands, and refuges, preserve wildlife habitat, and enhance recreational opportunities. The LWCF has a matching grants program that provides funds to states for planning, developing and acquiring land and water areas for state and local parks and recreation areas.

In 2002, Congressional legislation (Agreements to Limit Encroachments and Other Constraints on Military Training, Testing, and Operations, also referred to as the *Army Compatible Use Buffer*) granted DOD authority to partner with local governments and conservation organizations. For conservation purposes, DOD may use this authority to assist in acquiring land near military installations from a willing seller when the acquisition can protect both the environment and the military mission.

Installations can capitalize on this tool by pursuing available funding opportunities within the DOD Encroachment Partnership Program.

3.2 Needs Assessment

The extent to which encroachment is occurring around Fort Gordon is largely a matter of definition. If encroachment is defined simply as population growth closer to the installation then encroachment is occurring. The number of residents living within a 1-mile radius of the Fort has increased from 14,880 to 23,167 (or 55%) between 1990 and 2000. The growth rate around Fort Gordon is nearly four times the regional growth rate.

If encroachment is defined as growth in population and incompatible uses that threaten installation training, then Fort Gordon has largely escaped the encroachment problems seen at other military installations. Of the 8,287 new residents near the installation since 1990, over 95% located in already developed areas to the north, northwestern and northeastern portions of the installation. Population growth in these areas, away from noise contours, is considered compatible with installations operations.

Urban development presents a dilemma for Army installations. On the one hand, population growth impacts an installation's ability to conduct training, thereby negatively affecting readiness. On the other, population growth and corresponding increase in services and facilities, provide expanding housing, education, and employment choices and opportunities for service members and their dependents, the necessities needed to support recruitment and retention. The challenge for communities with military installations is the need to maximize the three R's.

The data in the preceding section suggests that Augusta area local governments have been effective in minimizing encroachment near Fort Gordon. Overall, current land use patterns reflect compatibility with Fort Gordon's training missions. In excess of two-thirds of the

lands surrounding Fort Gordon are classified as agricultural, forestry or undeveloped. The U.S. Bureau of the Census classifies less than 16.6% of the lands around the installation as urban. There are no residents located in proximity to Noise Zone III and less than 74 residents out of 327,560 (0.02%) are located within the Noise Zone II. Virtually no population growth has occurred within Noise Zone II since 1990. Approximately 3,803 acres lie within Nose Zone II, representing less than 0.5% of the region's land mass.

The evolution of this type of supportive land use environment is the result of both structural and planning dynamics. From a structural perspective, the existing land ownership patterns have been a primary element in minimizing incompatible uses and encroachment around Fort Gordon. The mining operations just south of the installation occur on vast tracts of land where the land is far more valuable for this use than for residential development or institutional uses. The agricultural and forest operations to the southeast and southwest occur on lands that have been owned by area families for generations. These residents have not developed their lands and are resistant to development. Land values have not increased at a sufficient rate to persuade these residents to sell. Furthermore, environmental constraints in the form of wetlands and floodplains have rendered the cost of developing land near those areas a costly endeavor. Finally, regional population growth has occurred at only a modest pace. Although Columbia County's growth rate is among the highest in the state, the rest of the region has lagged and lies below the state average. The lack of substantial population growth has resulted in less competition for land resources among local governments and Fort Gordon.

Fort Gordon's size and land use has contributed to sustainable land use and development patterns in adjacent areas. While Fort Gordon is not the largest Army installation, it has significant amounts of lands for training in relations to its missions and contains very few environmental constraints. Furthermore, the wooded nature of areas around training facilities has helped limit exposure to noise effects.

From a planning perspective, both Fort Gordon and local governments have engaged in cooperative and coordinated planning that has contributed to the supportive land use environment. The finding of "a well planned installation that encourages equally good planning" contained in the installation RPPM is indicative of a planning framework that stresses the interdependence of land, resources and missions. Furthermore, the existing compatibility tools section details an extensive and thorough web of coordination mechanisms that have resulted in minimizing incompatible development and encroachment. The advantage of local governments and Fort Gordon including one another on planning committees has been that both entities are aware of the other's land use and development plans. These mechanisms have been supplemented by state zoning legislation that has institutionalized coordinated land development review around Fort Gordon.

Existing zoning patterns have also contributed to compatibility. While 1-acre minimum lot sizes are no guarantee of preventing residential development, the zoning environment has prevented high densities around Fort Gordon's critical training facilities.

Finally, a common sense approach to land development on the part of both planning commissions and land developers has served to minimize incompatible development and encroachment. The low number of issued building permits and potentially incompatible rezonings indicates a concerted effort to limit development around the installation. Of the 727 potentially incompatible rezonings granted since 2000, only 9 were within a mile of Fort Gordon and none within Noise Zone II.

Towards a Future Environment

The future land use maps drafted by the counties represent compatible development patterns that will likely minimize development near Fort Gordon's critical training areas. The study area is projected to add 83,422 new residents (or a 25.4% increase) through 2025. Over three quarters of this growth is projected in Columbia County, the jurisdiction least affected by noise exposure. Furthermore the municipalities, particularly Grovetown and Hephzibah, are projected to continue the trend of growing at a much faster rate than the counties. The primary benefit of the projected rapid growth of the cities is that population concentration will occur in areas away from Fort Gordon.

As noted, the military's cantonment (or urban) area is adjacent to the major concentrations of urban development in the surrounding counties. Ideally, this is where growth should occur. Encouraging growth in these areas both meets the goals and objectives of local comprehensive plans and limits exposure to noise and control burning effects.

Residential development in Jefferson and McDuffie Counties is not projected to increase near Fort Gordon. McDuffie County's proposed change from 1 to 5 acre minimum lots will help mitigate encroachment in the south and southwest areas around the installation. In Richmond County, future land use projections indicate increases in residential development further south but away from Fort Gordon. No new residential development within Noise Zones I and II appears in the future land use map. In Columbia County, more residential growth is projected south of Grovetown, including a higher share within Noise Zone I.

A review of programmed infrastructure projects highlights positive development patterns. All of the planned major highway projects involve widening existing roadways located away from Fort Gordon. There are also no utility projects planned in proximity to the installation.

Environmental constraints and existing patterns of ownership will continue to limit development around Fort Gordon's critical training areas. The primary variable that may alter this future land use scenario is changing land values in Richmond County. Despite a projected below-average growth rate, there is significant growth occurring internal to the county. In general, residents are moving from areas in the northern and central parts of the county to areas further south due to the availability of the land. New residents are also opting to reside further south. While the likelihood of large-scale agricultural and mining operations being replaced with uses of higher density and intensity (i.e. single-family residential, schools, churches, and commercial centers, etc.), is low, the challenge for the

county will be to accommodate the growth occurring in the south in a way that minimizes development pressures around Fort Gordon.

In the past decade, the proportion of planned unit developments has increased dramatically, resulting in more clustered land use. Clustering development can be an effective tool in promoting land use compatibility around a military installation, particularly on larger parcels that straddle noise contours. Conventional zoning typically spreads housing units evenly across a parcel regardless of landscape context. As part of a cluster zone, however, developers must separate the buildable areas of the parcel from environmentally sensitive areas. The district allows more compact lots in the developable portion of the site in exchange for the permanent protection of site land with conservation value. Should this trend towards increasing planned units developments hold, Richmond County will be well positioned to manage growth in the southern part of the county.

The following section provides guidance to local governments, Fort Gordon and other stakeholders involved in land development. The section identifies a variety of recommendations to assist in land use compatibility and preventing encroachment. It recognizes that local governments are solely responsible for land use planning and zoning regulation in their jurisdictions. It also recognizes that Fort Gordon is solely responsible for land use and regulation of the property that is under its control.

3.2.1 General Land Use Planning

The ability of Fort Gordon to perform its critical missions today and in the future is related in large part to the compatibility of the land uses in its vicinity. One of the reasons for the original selection of the site for Fort Gordon in the CSRA was based on the largely undeveloped character of lands in the surrounding area. Recognizing that the expansion of the Augusta metropolitan area is going to continue, it is essential to ensure compatibility between installation operations and local development.

The JLUS recognizes that land use regulations are challenging for local governments to implement because they take place in the context of individual private property rights. One of the goals of the JLUS is to strike a balance between community growth and installation training.

Although lands near Fort Gordon's critical training areas are not projected to absorb a significant share of the expected growth, local governments and Fort Gordon are encouraged to coordinate planning and development. Just as urban encroachment in surrounding areas can become a sustainability issue for Fort Gordon, change of military mission, training, and land use activities at the installation can have a negative impact on adjacent communities.

Currently, local governments are required to inform and accepts comments from Fort Gordon on any potential zoning change within 3,000 feet of the installation. This effort should be supplemented by including any major development within 3,000 feet. Major

development shall include the thresholds established by the Developments of Regional Impacts (DRI). For developments smaller than those included in DRI's, local governments should inform Fort Gordon if they feel a development would impact operations. Fort Gordon should be given 15 days to respond with written comments for consideration by local governments. Local governments, however, retain the authority to enact land use decisions based upon locally determined interests and needs.

Conversely, Fort Gordon should notify affected local governments of any major actions that may affect the noise environment or produce other operational impacts on the surrounding communities. It will be up to the discretion of Fort Gordon to determine what constitutes a major action. Local governments should be given 15 days to respond with written comments for consideration by Fort Gordon. Fort Gordon, however, retains full authority to enact land use decisions based upon Army interests and needs.

Local governments should inform Fort Gordon of changes or amendments to land development codes such as zoning or subdivision ordinances. It is essential that Fort Gordon planners are knowledgeable of the zoning districts that surround them.

One of the primary compatibility measures identified in the preceding discussion is serving jointly on various planning committees. This effort is partly responsible for encroachment mitigation near Fort Gordon and should continue. Special attention should be paid to coordinating and implementing the Butler Reservoir Management Plan.

3.2.2 Noise Disclosures and Building Codes

The principal issue that defines compatibility is noise effects. The Army has made great strides toward the reduction of noise. Beyond strategic placements of training facilities, Fort Gordon publishes live-fire exercises in the Signal, refrains from firing when weather conditions propagate noise and coordinates training to reduce the number of rounds fired at critical times, such as at night.

But noise cannot be eliminated completely. There are definite engineering limitations to the noise reduction that can be achieved. Given the impulsive nature of the heavy artillery noise generated on-post, physical barriers such as vegetated buffers are impractical mitigation options. Such buffers would have to be very close to the source of the noise, interfering with the use of maneuver areas. Even with buffers in place, sound waves would bounce off relatively intact from the buffer and continue traveling off-post.

A fundamental principle of land use compatibility is to avoid concentrations of people exposed to noise. Broadly, there are two principal ways to achieve this: limiting exposure of people to noise-sensitive activities by regulation, and making potential residents aware of noise effects to minimize complaints.

The noise issue is largely one of numbers. Even if noise levels associated with installation operations do not increase, the number of negative interactions with individuals on the ground must increase simply as a result of growth in population.

Minimizing people density in the relevant compatibility areas requires changes to the current zoning ordinance. Zoning, through either the rezoning process or the addition of an overlay zone, would regulate uses that result in concentrations of population such as residences, commercial and retail establishments, churches, schools, restaurants, and so forth. As noted in the preceding section, zoning changes cannot be arbitrary. Local comprehensive plans do not currently identify noise areas, nor do they specify any need for regulatory changes in those areas. Furthermore, the data indicates that there is an insufficient population base within Noise Zone II to justify regulatory action. As such, local governments should use disclosures of noise impacts rather than overly regulating existing land use around Fort Gordon.

Noise disclosure has been an effective tool in minimizing residents' complaints throughout the nation. Although is it sometimes difficult to imagine given Fort Gordon's prominence in the region, potential homebuyers may be unaware of special circumstances and conditions that may exist in a given environment, which could detrimentally affect both the area's quality of life and the residential resale values. This could particularly be a problem for potential buyers of existing or newly built homes located within a 1-mile radius of the installation. A portion of that area is affected by artillery noise and smoke. It is important to ensure that potential homebuyers and others with a stake in land development are provided with the information needed to make well-informed decisions about whether or not to locate in an area.

Local governments should incorporate noise disclosure as part of the rezoning process for areas within Noise Zone I and II, and within a 1-mile radius of Fort Gordon. Disclosures should inform rezoning applicants of the nature and extent of the noise and hazards generated by Fort Gordon's training. In addition, local governments should include noise zone delineations around Fort Gordon as part of parcel mapping.

In some cases, simply disclosing noise level information does not guarantee that the information will be used. Programs will be required to educate residents, potential residents, realtors and land developers about the effects of noise. As the regional planning and development commission representing all study area local governments, the CSRA RDC should lead this effort by working with affected stakeholders on the issue.

Disclosures during the rezoning process and education should be supplemented with public relations. The potential of noise complaints will be reduced by providing the news media with press releases when unusual operations are scheduled or when normal operations are scheduled to resume after a period of inactivity. Press releases should include a telephone number that the community can use to receive additional information.

Building codes are the most effective mechanism for ensuring noise/vibration reduction measures. Currently, local governments use the International Building Code (IBC) or some

variant of it. The IBC is code is stringent in ensuring acceptable construction standards but lacks the FICUN guidance discussed in the previous section. Local governments with lands within Noise Zone II should adopt the recommended FICUN sound and vibration reduction measures guidance to supplement existing codes.

3.2.3 Land Acquisition

Specific land acquisition is not recommended as part of the JLUS. However, future conditions may warrant some form of acquisition. The principal conditions that would trigger acquisition revolve around installation growth (i.e. new missions) or urban development that threatens Fort Gordon's operations.

The preceding discussion highlighted numerous methods for land acquisitions. Fee-simple purchase of land is an expensive undertaking. However, purchasing the development rights for land can be a more affordable way to protect areas surrounding the installation should the need ever arise. If Fort Gordon or local governments need to protect the installation from encroachment, the need will be to prevent development of incompatible uses rather than all development. Some types of development are compatible with the activities of military installations, such as certain commercial, industrial, and agricultural uses. Thus, the cost of purchasing the development rights for uses incompatible with a military installation's mission could be a fraction of a conventional purchase of development rights agreement.

Should this need ever occur, local governments, Fort Gordon, the Army (through the Compatible Use Buffer Program) and non-governmental entities such as conservation trusts (particularly the Savannah River Land Trust) should coordinate to achieve multiple goals and objectives in any land acquisition program.

3.2.4 JLUS Implementation Committee

One of the most critical outcomes of the JLUS study is the process itself, that is, the organizational framework for making technically sound, community-based, and collaborative planning decisions in the years ahead. Stakeholders from the community and Fort Gordon have the opportunity, through an implementation committee (IC), to foster communication, identify mutual interests, and work toward reasonable solutions that support both civilian and installation goals. Such organization creates the institutional capacity to support on-going implementation.

In order to continue the forward momentum, it is recommended that the existing Technical Advisory Committee serve as the IC, the group responsible for monitoring the progress of JLUS recommendations and implementation. Local governments and Fort Gordon may appoint any other staff members at will.

The IC should meet biannually to review JLUS implementation progress and to make further recommendations based on new developments. The IC will help to identify impediments to

the implementation of the recommendations and will be aided and guided by the staff of the CSRA RDC.

Monitoring of the land use and noise environments, especially noise-sensitive areas, is one of the major tasks of the IC. When these changes occur, land use maps and noise contours should be updated and their impacts reviewed. The simplest way to monitor these developments is through the use of Geographic Information Systems (GIS). GIS is a technology that is used to view and analyze data from a geographic perspective. All development activity that is currently mapped should be available to all members of the IC.

A major component of GIS is linking existing data to aerial photography. Currently, all study area governments and Fort Gordon obtain aerial photography services. As seen in the aerial maps in the preceding section, governments purchase aerials at different times and different resolutions (i.e. 100x zoom versus 40x zoom, color versus black/white, etc). In the future, entities should coordinate to purchase these services jointly to reduce costs and provide a method to adequately monitor development patterns.

To keep the JLUS current, it is recommended that the document be reviewed annually and updated at least every five years. An annual evaluation of the plan is required to review changes in training and mission, land uses, and local land use planning documents. If changes result in on or off-post impacts, an update of the plan is required. Every five years, or sooner if necessary, it is recommended that the plan be updated to incorporate changes in the existing or planned land use and noise environment of the area. The plan should also be updated anytime a comprehensive revision to the IENMP, RPMP or the CSRA Regional Plan occurs, or when significant numbers of new personnel or equipment are assigned to the installation.

3.2.5 Recognition and Incorporation

While the JLUS is not adopted in the traditional sense by local jurisdictions and is not a regulatory document, local governments and Fort Gordon should recognize the completion of the JLUS process and its status as guidance for land use decisions in the vicinity of Fort Gordon. One of the most important opportunities for land use coordination is local government comprehensive plans and the Fort Gordon RPMP, including future land use maps which lay out long-range land use and growth policies for entities. These documents are critical because they set community and installation goals and objectives, create a framework for implementation, and lay the groundwork for any new adopted tools. With a future land use map, local governments and Fort Gordon can clearly lay out their priorities for growth, while also coordinating land planning issues with each other.

Technical information related to noise and smoke should be included and incorporated in all relevant planning documents. In addition, local comprehensive plans, CSRA regional plans and RPMP plans should include specific language on JLUS coordination. Language should emphasize the following:

- Recognition of the relationship between local governments and Fort Gordon.
- The desire to foster and promote cooperation among local governments, Fort Gordon, and other stakeholders in land use planning decisions.
- Discussion of other complementary land use and environmental protection goals in addition to currently identified compatibility issues.

Incorporating this language into local government and Fort Gordon planning documents during plan updates or the amendment process is an appropriate implementation strategy.

Local governments and Fort Gordon should review relevant regulations to identify changes that are necessary to incorporate recognition and consistency with the JLUS.

3.2.6 Coordination with Other Stakeholders

Coordination with other stakeholders is a major element in the compatibility equation. Several entities, such as rail corporations, local utilities departments and the Georgia Department of Transportation own tracts of lands, maintain easements or have the ability to shape land use around Fort Gordon. It is essential that open lines of communication are maintained with these entities as well as others with a stake in land use. The IC should review possible growth-inducing impacts of service extension into the noise zones.

Coordination is also recommended with GMACC. Because of the importance of military installations to the state economy, further action to protect and support military facilities is inevitable. The review of efforts to prevent encroachment in other communities highlight some of the measures taken and it is plausible that GMACC will adopt some of these compatibility tools. The IC should participate in GMACC discussions and formulation of future policies to ensure local needs are addressed as part of the development of statewide policies.

3.2.7 Mitigation

As noted, operational modifications to minimize noise effects is already occurring at Fort Gordon. Exploring feasible strategies to reduce noise effects is an ongoing effort that involves Fort Gordon as well as USACHPPM and other federal non-military agencies. In coordination with these agencies, local government and Fort Gordon planners should identify and assess the usefulness of various techniques used by other political jurisdictions with similar military installations for their potential to be adapted to the needs of various CSRA political jurisdictions.

Per Army Regulation, Fort Gordon maintains a noise complaint log. Fort Gordon should share the log with area local governments to assess complaints and assist with future mitigation strategies. A review of complaints is also required to determine the success of education awareness programs. The data gathered during the investigation process should

be used during the review of proposed actions both at Fort Gordon and adjacent local governments.

3.2.8 Communication

Communication options raise overall awareness of Fort Gordon activities and their associated impacts. One of the most effective means for strengthening the relationship between Fort Gordon and adjacent communities is to help people understand how Fort Gordon operates and why it generates certain impacts on surrounding areas. Both community and military stakeholders have expressed a strong interest in maintaining open communication and local residents in affected communities greatly value opportunities to participate in noise mitigation and other environmental management initiatives.

Local governments and Fort Gordon should each develop appropriate mechanisms to ensure that residents, developers, businesses, and local decision-makers have adequate information about installation operations, procedures to submit comments, and any additional local measures to promote land use compatibility around the installation. The following tools are recommended:

- The provision of a JLUS link from existing local government and Fort Gordon websites.
- Creation and distribution of a brochure explaining post activities and compatibility issues.
- Public meetings, hearings, and workshops with residents and stakeholders during major plan updates.

Both the local community and Fort Gordon have an interest in maintaining a land use partnership. There are few places where the military contributes so much to the economic and cultural vitality of a region. Conversely, there are few regions that can offer service members all the benefits of large metropolitan areas without the congestion and high costs of living.

Incompatible development around Fort Gordon may result in additional constraints on operations, and could ultimately lead to loss of part of the installation's mission or even its closure, with the resulting loss of significant economic benefits to the community. Through the JLUS process, there is an opportunity to develop sound long-range planning for the area, which will protect Fort Gordon and its economic benefits while allowing other complementary development to expand the regional economy.

The 50-year partnership between Fort Gordon and the surrounding communities has resulted in a land use environment that is supportive of the installation's ability to conduct training with minimal restrictions. This has been accomplished through effective coordinated and cooperative land use planning.

The true value of any plan is determined by whether and how expediently it is implemented. Throughout the process of developing the JLUS, the policy and technical committees have been very conscious of the need to be able to move from policy to action as quickly as possible. The resulting set of tools seeks a balance among these diverse interests by stressing:

- The feasibility of implementation.
- The ability to sustain the economic health of the region and to protect individual property rights.
- The protection of the critical military missions performed by Fort Gordon.
- The protection of the health, safety, welfare, and overall quality of life of those who live and work in the CSRA.

The implementation schedule has been developed in recognition of the ongoing planning by local governments and Fort Gordon, as well as considering the viewpoints expressed through the public participation process, and the need to present strategies that realistically accomplish the goal of preserving Fort Gordon and its mission. While the changing nature of economics and politics may change the scope and timing of the implementation strategies, these recommendations provide the framework and guidance for achieving long-term compatibility.

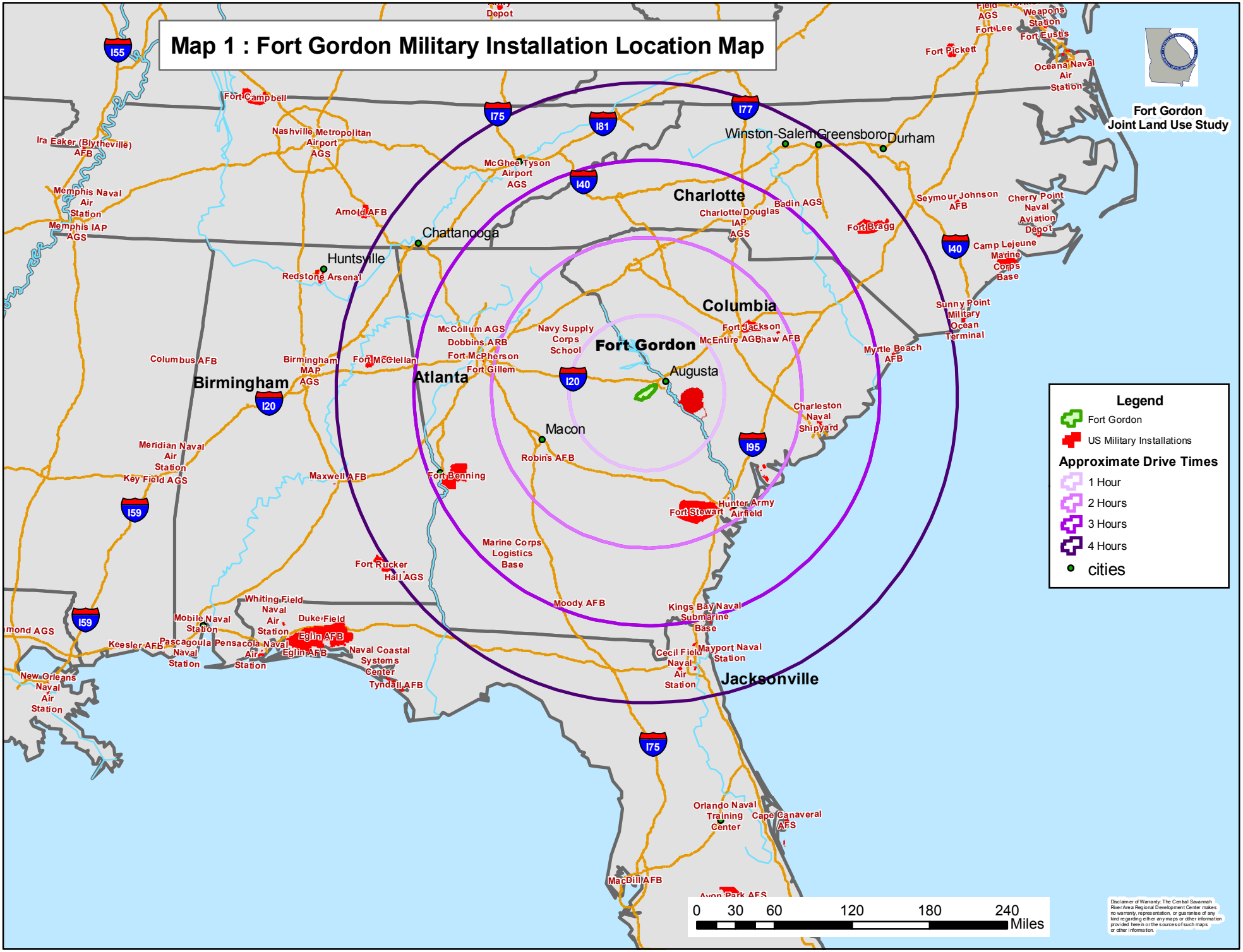
The JLUS is a continuous process that requires constant work. It is not a one-time plan that is written and forgotten. To be effective, the process must serve the ever-changing noise environment of the installation and development of the surrounding areas. To accomplish this task, the plan must be kept current so that its recommendations are consistent with the mission of the installation and needs of the surrounding communities.

Summary JLUS recommendations are presented in Table 24.

Table 24: JLUS Implementation Schedule	
Recommendation	**Timeline**
Local Governments	
1) Support the efforts of the Georgia Military Affairs Coordinating Committee (GMAC) and state legislation to protect Georgia military installations from encroachment.	Ongoing
2) Adopt noise and smoke disclosures in Noise Zone I and II and within a 1-mile radius of Fort Gordon as part of the rezoning process.	2005-2010
3) Guide development away from Noise Zone II. Consider Noise Zone II as a factor in capital improvement projects and during development review.	Ongoing
4) Promote and encourage new population growth and land development (especially planned unit developments) in urban areas and areas already served by infrastructure and community facilities.	Ongoing
5) Adopt FICUN guidance in building code modifications to mitigate noise for new structures in Noise Zone II areas.	2005-2010
6) Explore all available options for acquisition of strategic properties (i.e. purchase of development rights, transfer of development rights, fee simple purchase, etc).	Ongoing
7) Coordinate with conservation groups and explore greenspace options for strategic lands adjacent to Fort Gordon.	Ongoing
8) Update local planning documents to incorporate JLUS recommendations.	2005-2010
9) Coordinate city-county planning, particularly large-scale development, utilities and road projects.	Ongoing
10) Advise Fort Gordon of pre-planning phase of subdivisions and other large-scale development and redevelopment within 3,000 feet of the installation.	Ongoing
11) Provide noise contour layer in parcel mapping available to residents.	2005-2010
12) Appoint staff to serve on the JLUS committee to monitor and guide implementation of JLUS recommendations.	Ongoing
13) Incorporate JLUS Recommendations in important planning initiatives (air and water quality, transportation, etc).	2005-2010
Fort Gordon	
1) Pursue appropriate measures and construction techniques to minimize noise and smoke effects.	Ongoing
2) Improve existing community relations and education programs to ensure residents are kept informed about operational changes that may alter the noise and burn environment.	Ongoing
3) Develop and maintain user-friendly webpage available to the general public outlining areas of noise.	2005-2010
4) Provide schedule of range activity to local media consistent with security constraints.	Ongoing
5) Update planning documents to incorporate JLUS recommendations.	2005-2010

6) Model smoke effects for future planning efforts consistent with available resources.	2005-2010
7) Appoint staff to serve on the JLUS committee to monitor and guide implementation of JLUS recommendations.	Ongoing
8) Continue to coordinate on important planning initiatives (air and water quality, transportation, etc).	Ongoing
9) Advise local governments of on-post land use changes that may impact adjacent lands.	Ongoing
Implementation Committee /CSRA RDC	
1) Disseminate information on the JLUS and its implementation through ongoing media.	Ongoing
2) Provide a clearinghouse for information to ensure that residents, developers, businesses, and local decision-makers have adequate information about Fort Gordon operations, noise contours, and any additional measures to promote compatibility.	Ongoing
3) Update staff contact directories.	2005-2010
4) Educate stakeholders (lending institution, real estate, developers, etc) on noise and smoke zones.	Ongoing
5) Coordinate with construction and development organizations to ensure familiarity with noise attenuation techniques.	Ongoing
6) Coordinate activities with the GMACC and state & federal stakeholders.	Ongoing
7) Explore partnerships with environmental and conservation organizations and DOD on land use issues and funding.	Ongoing
8) Educate property owners within Noise zone II on attenuation techniques.	Ongoing
9) Develop and monitor best practices.	Ongoing
10) Update regional plans to incorporate JLUS recommendations.	2005-2010
11) Host and provide support for implementation committee meetings.	Ongoing
12) Provide support for tasks outlined.	Ongoing
13) Update JLUS every five years or as needed.	Ongoing

Map 1 : Fort Gordon Military Installation Location Map



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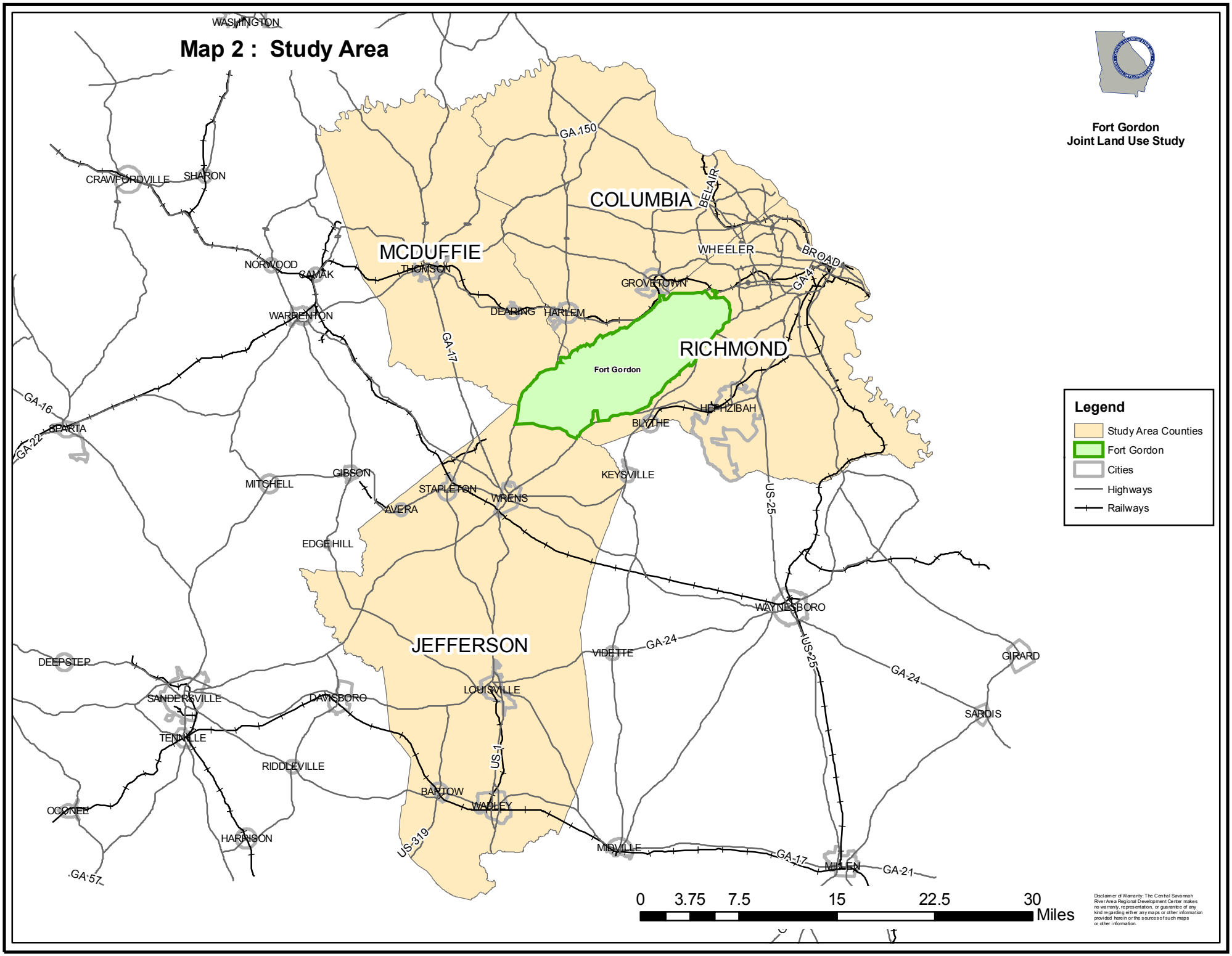
Map 2 : Study Area



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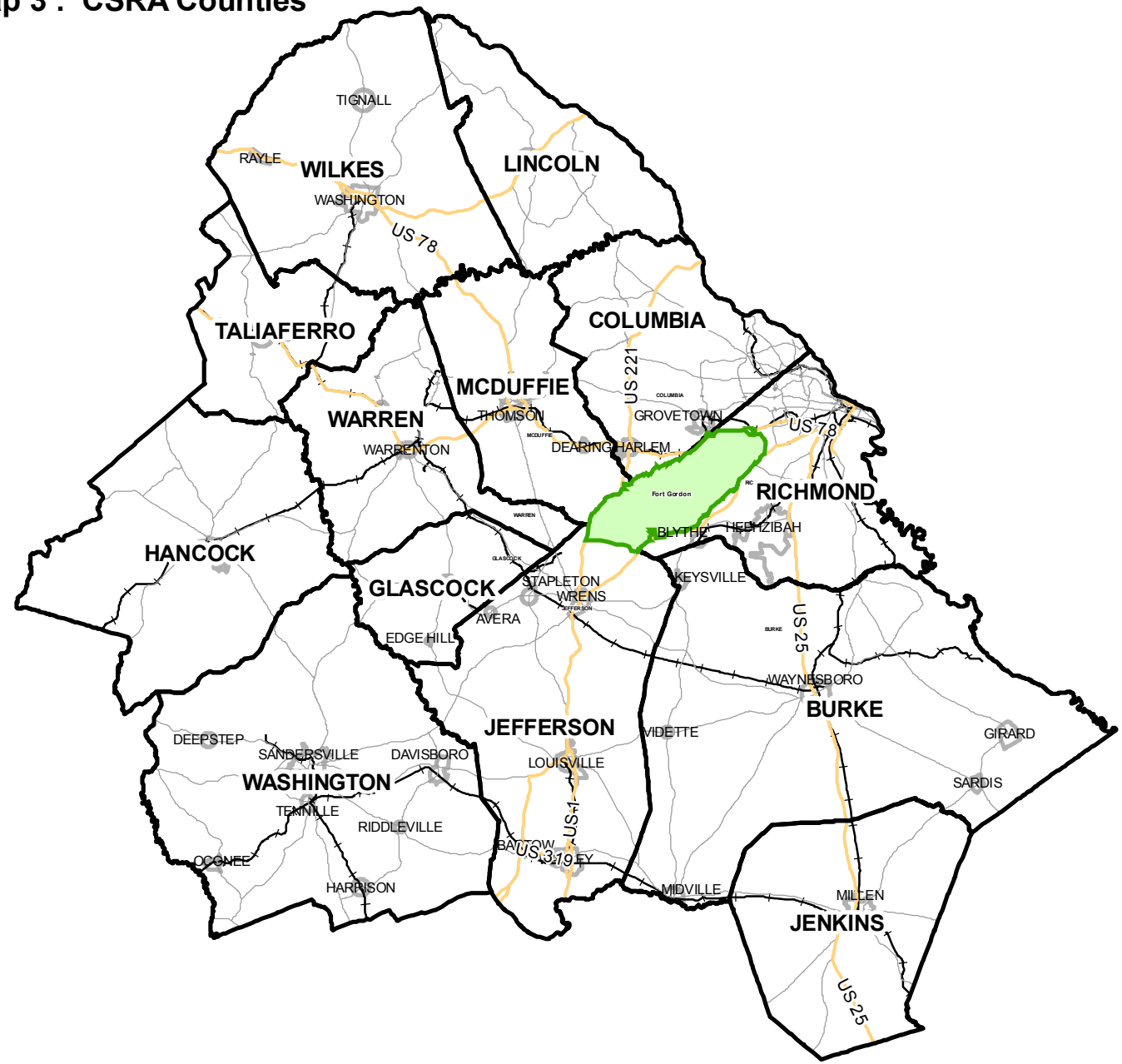
Map 3 : CSRA Counties



Fort Gordon
Joint Land Use Study

Legend

- Fort Gordon
- County Boundaries
- Cities
- Roads
- US Highways
- Railways

0 5 10 20 30 40 Miles

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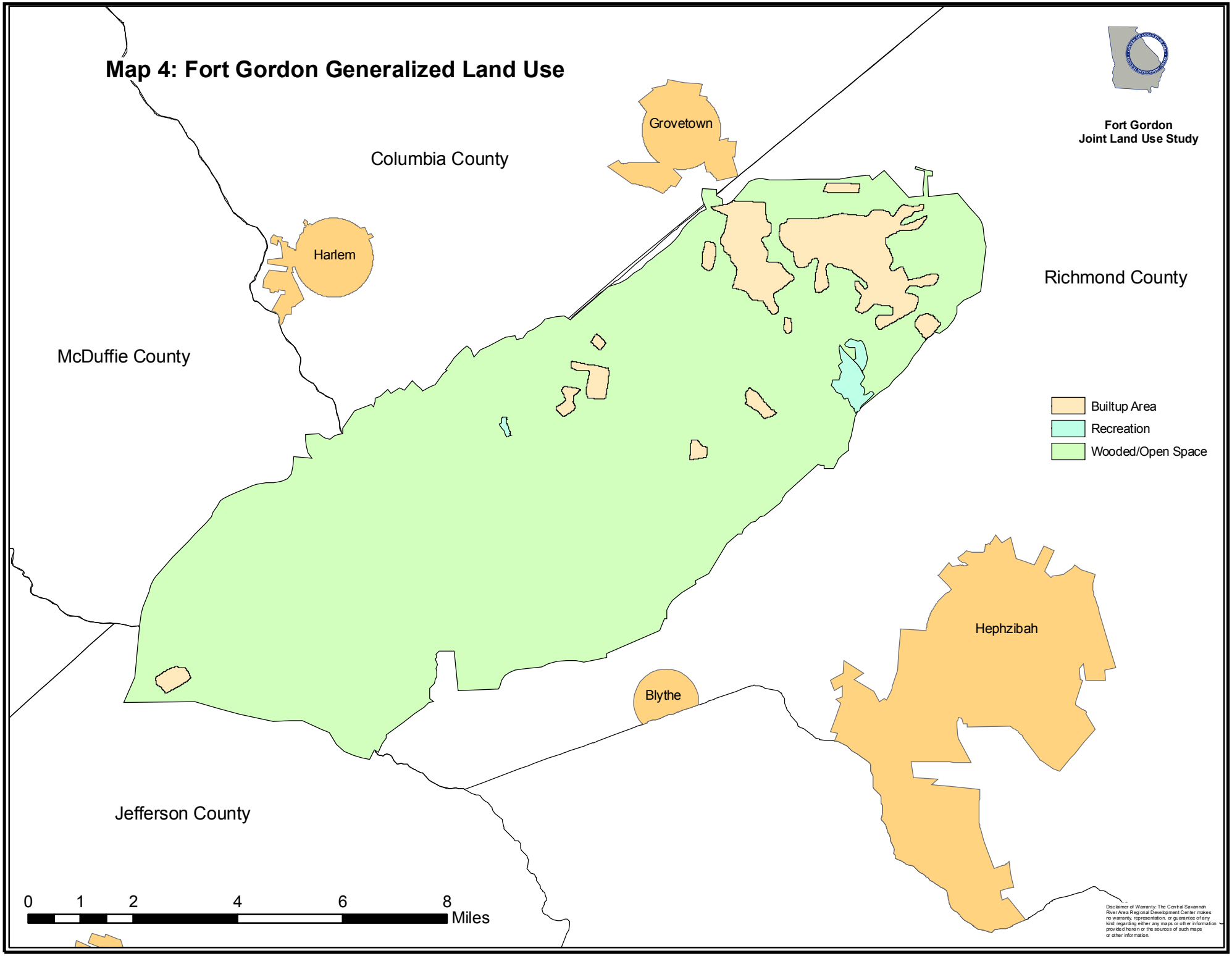
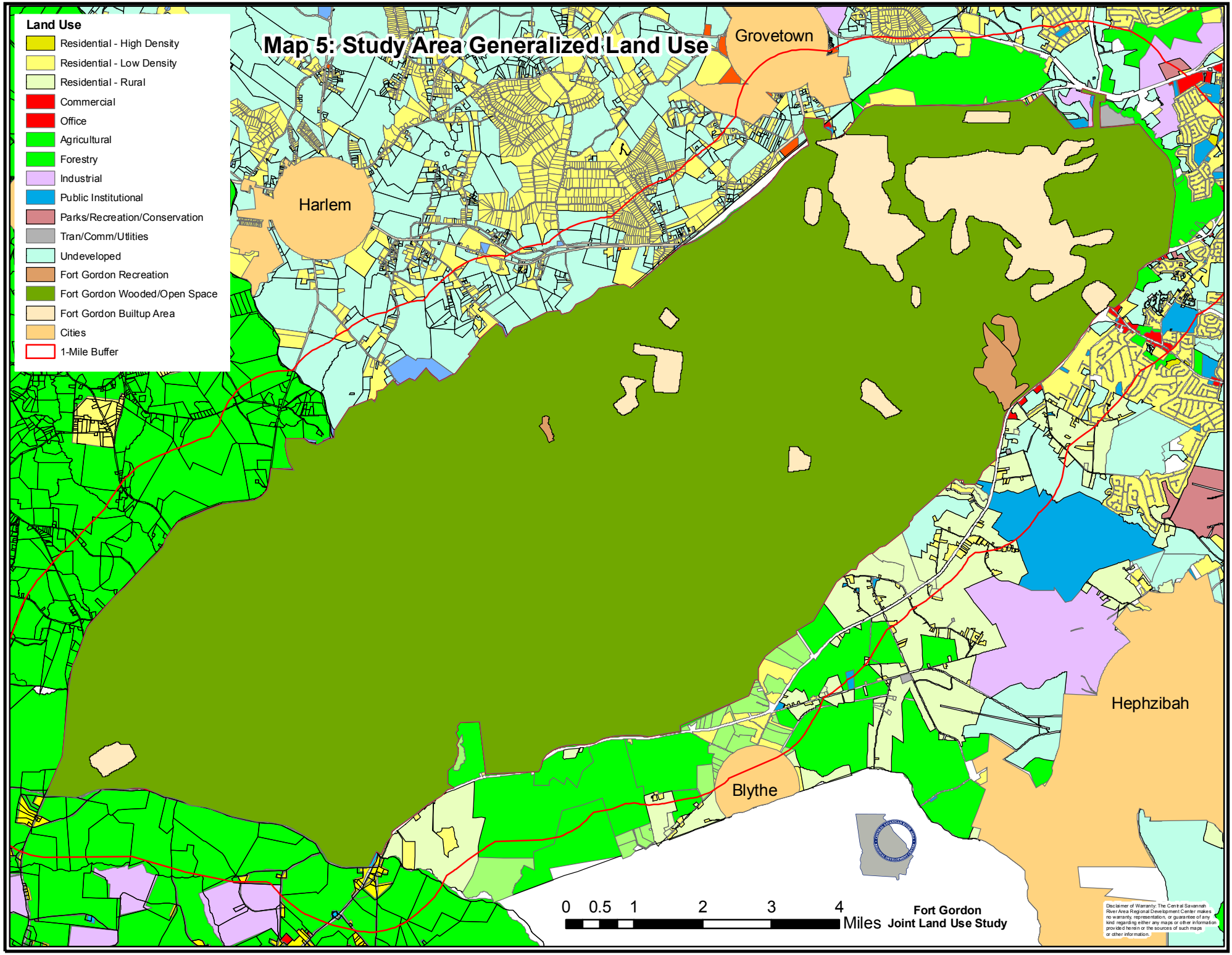
Map 4: Fort Gordon Generalized Land Use




Map 5: Study Area Generalized Land Use
Land Use
Residential - High Density
Residential - Low Density
Residential - Rural
Commercial
Office
Agricultural
Forestry
Industrial
Public Institutional
Parks/Recreation/Conservation
Tran/Comm/Utlities
Undeveloped
Fort Gordon Recreation
Fort Gordon Wooded/Open Space
Fort Gordon Builtup Area
Cities
1-Mile Buffer
Grovetown
Harlem
Blythe
Hephzibah
0 0.5 1 2 3 4
Miles
Fort Gordon
Joint Land Use Study
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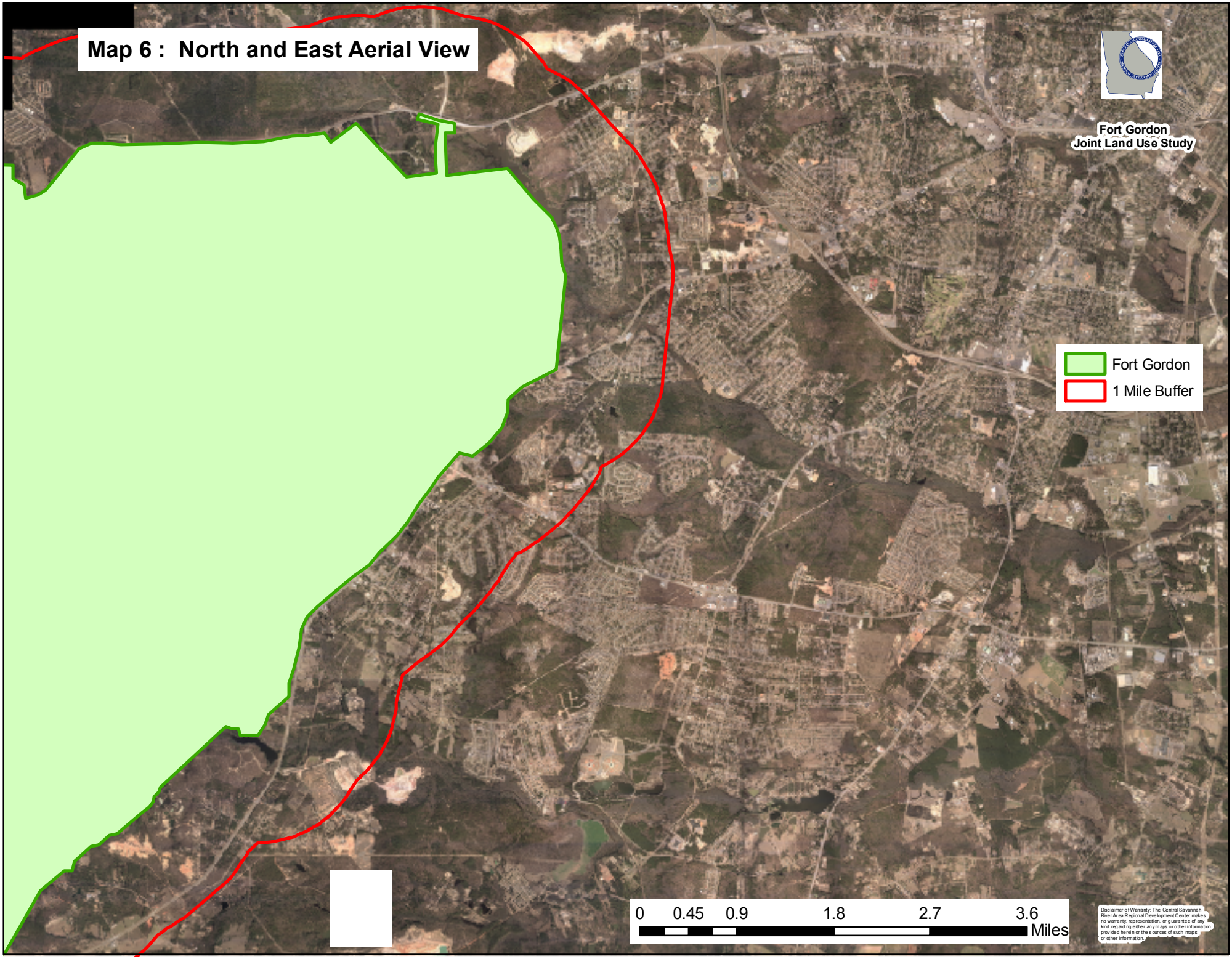
Map 6 : North and East Aerial View
Fort Gordon
Joint Land Use Study
Fort Gordon
1 Mile Buffer
0 0.45 0.9 1.8 2.7 3.6
Miles
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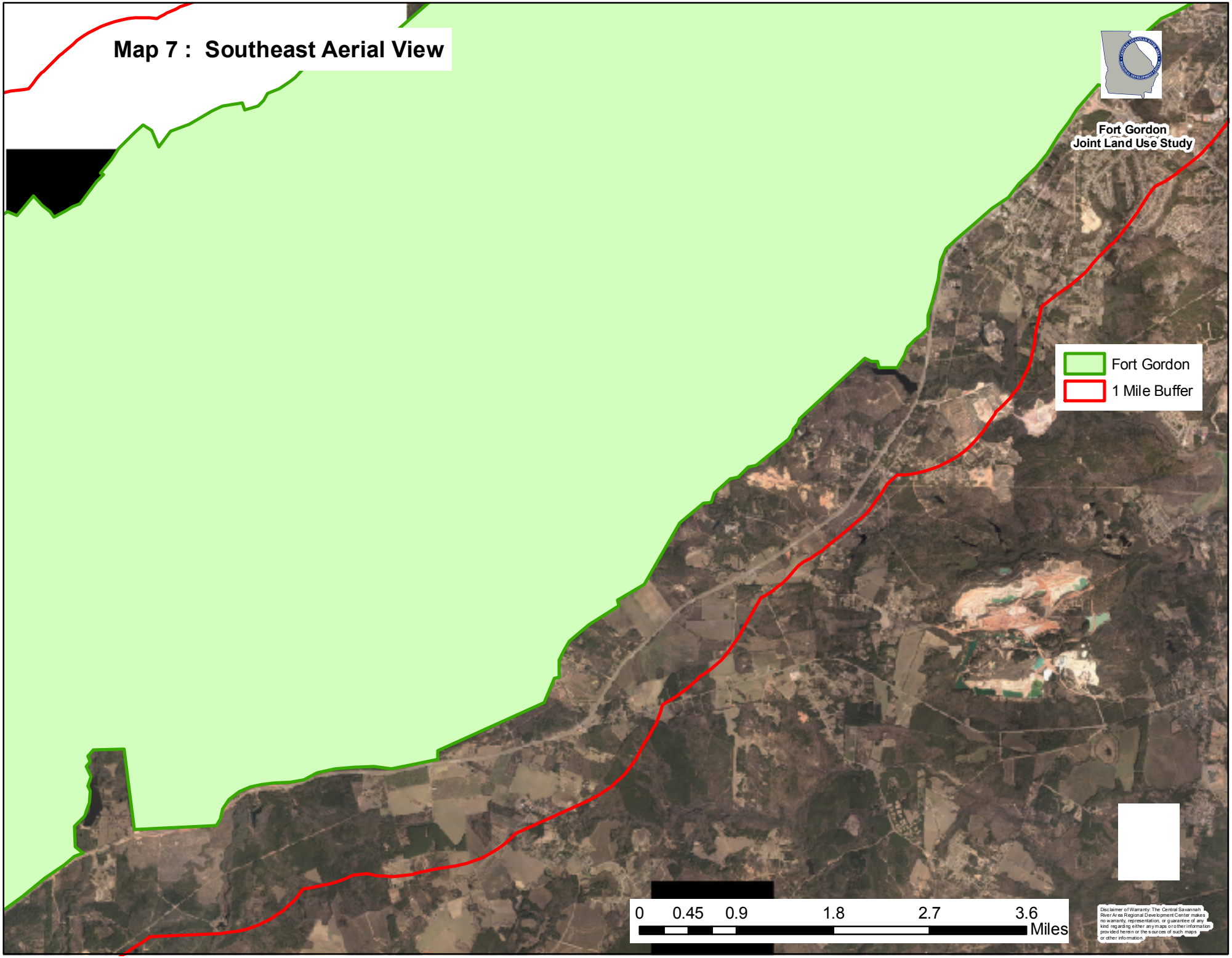
Map 7 : Southeast Aerial View



Map 8 : South Aerial View
Fort Gordon
Joint Land Use Study
Fort Gordon
1 Mile Buffer
0
0.25
0.5
1
1.5
2
Miles
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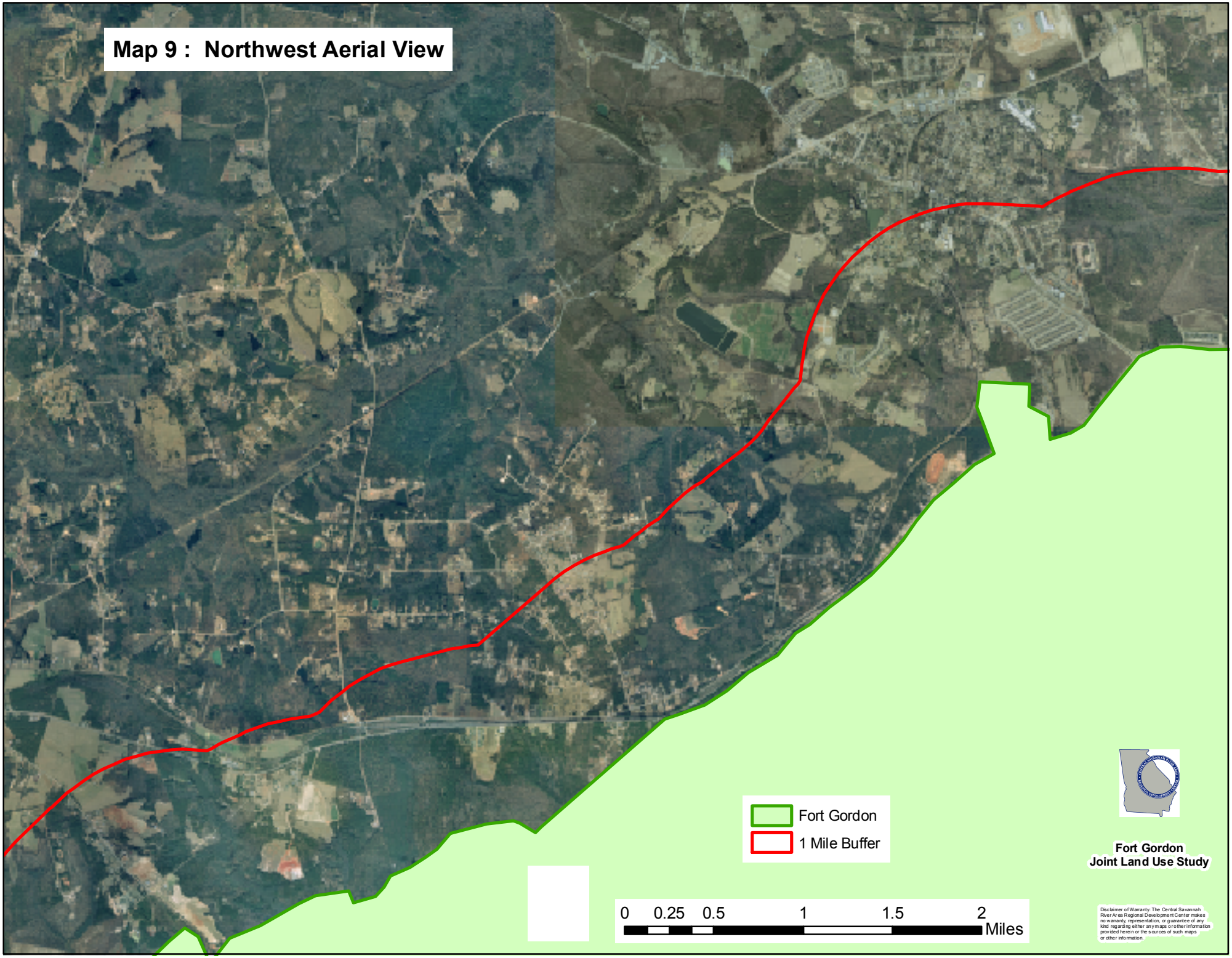
Map 9 : Northwest Aerial View
Fort Gordon
1 Mile Buffer
0 0.25 0.5 1 1.5 2
Miles
Fort Gordon
Joint Land Use Study
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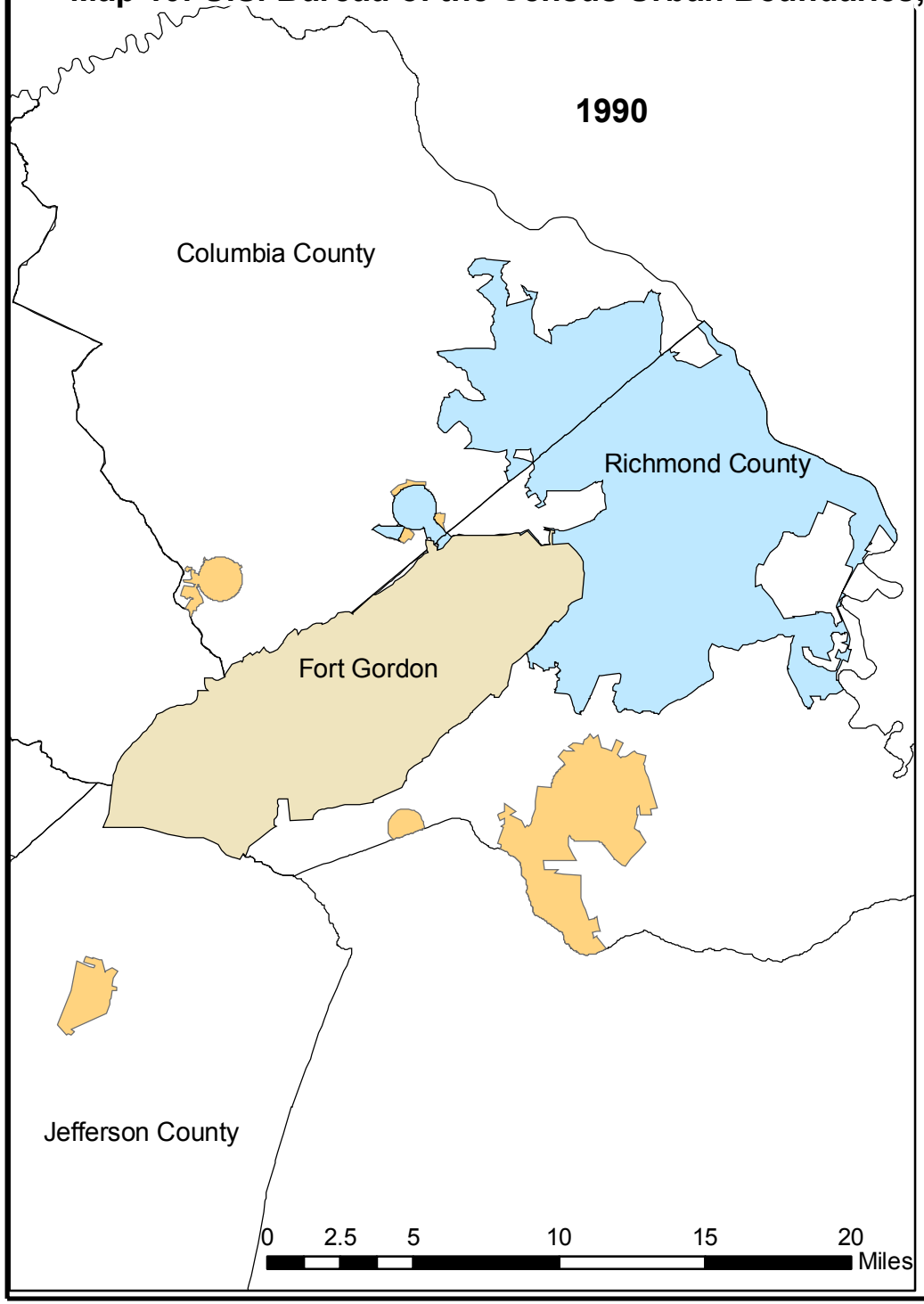
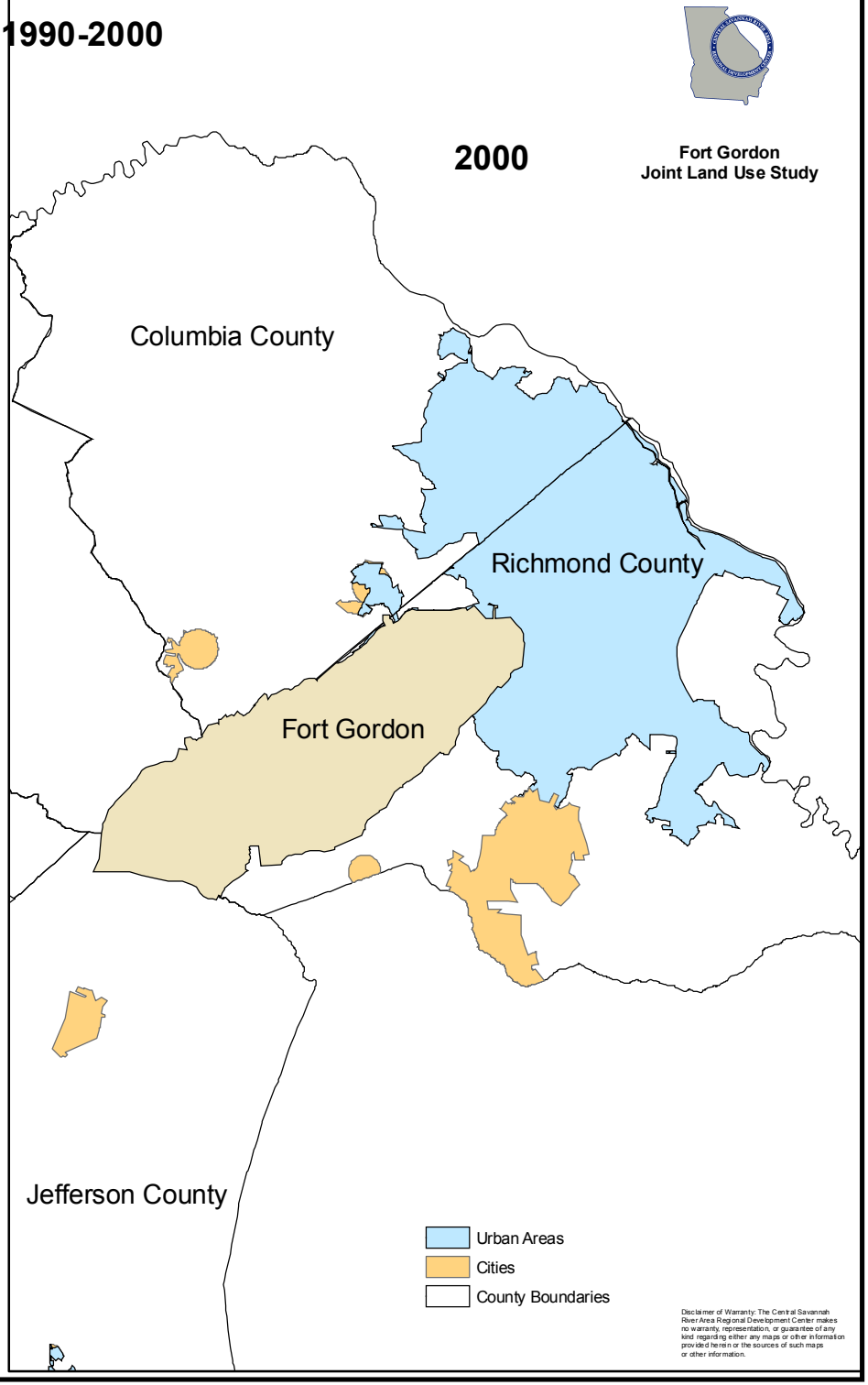
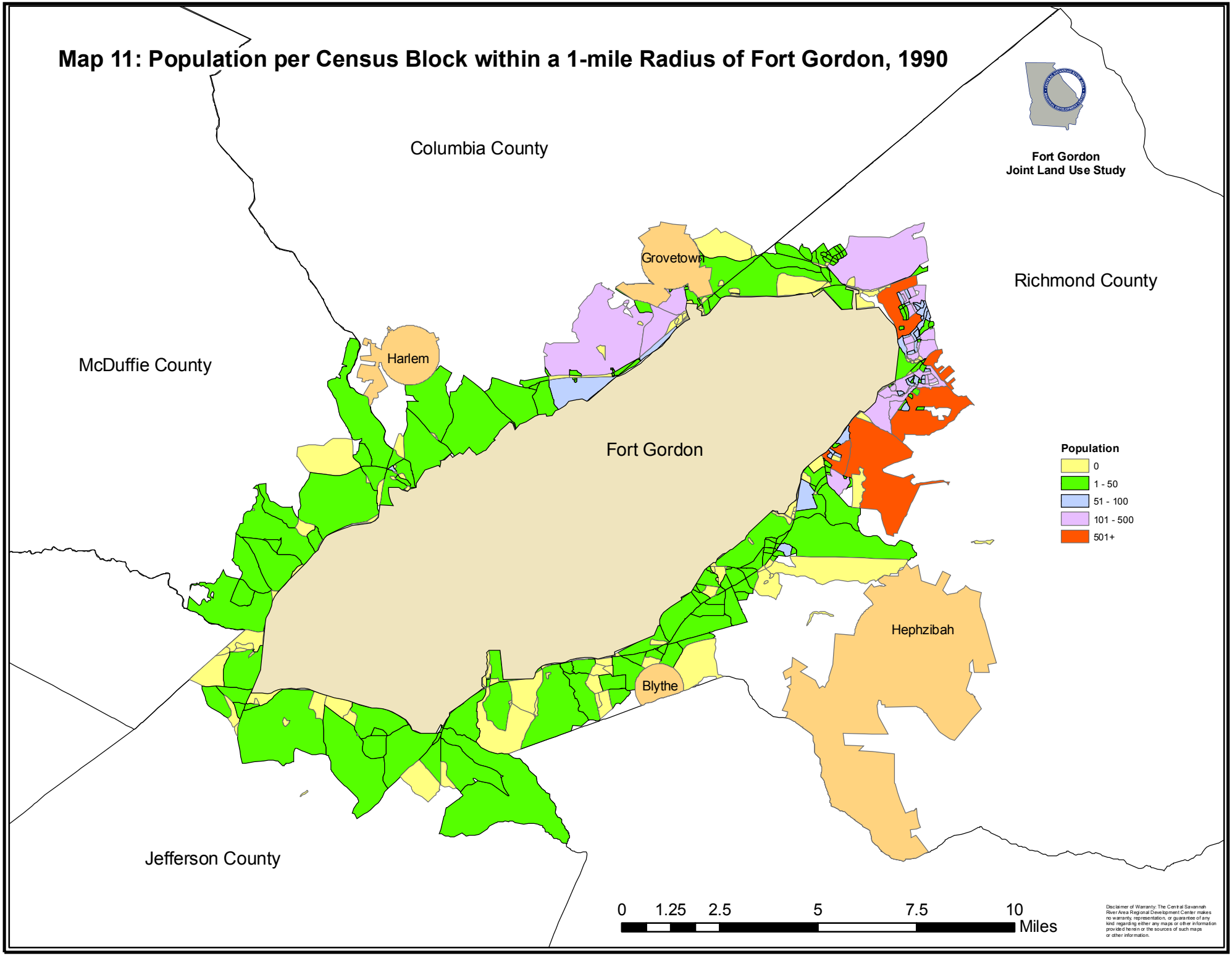
Map 10: U.S. Bureau of the Census Urban Boundaries, 1990-2000





Map 11: Population per Census Block within a 1-mile Radius of Fort Gordon, 1990



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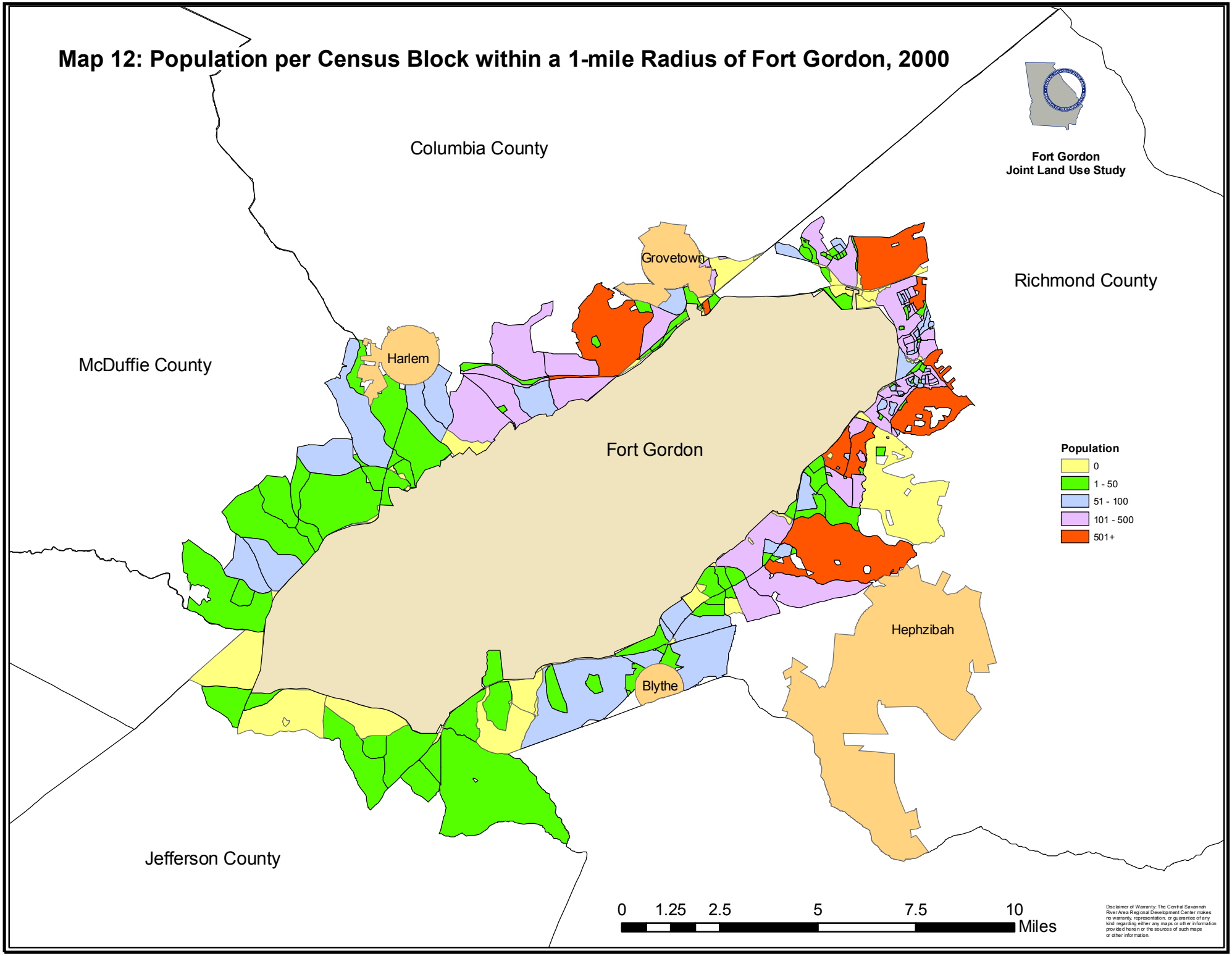
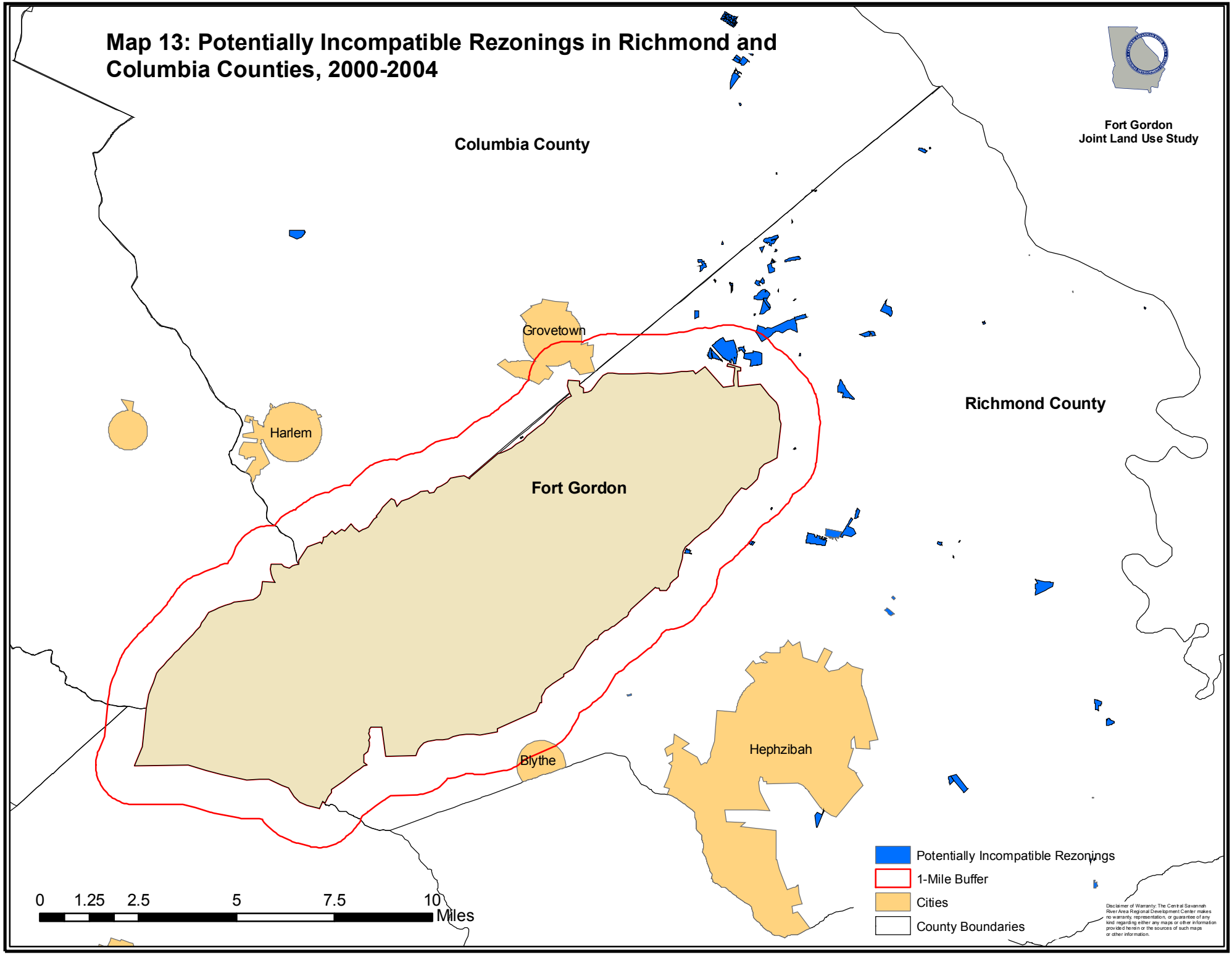
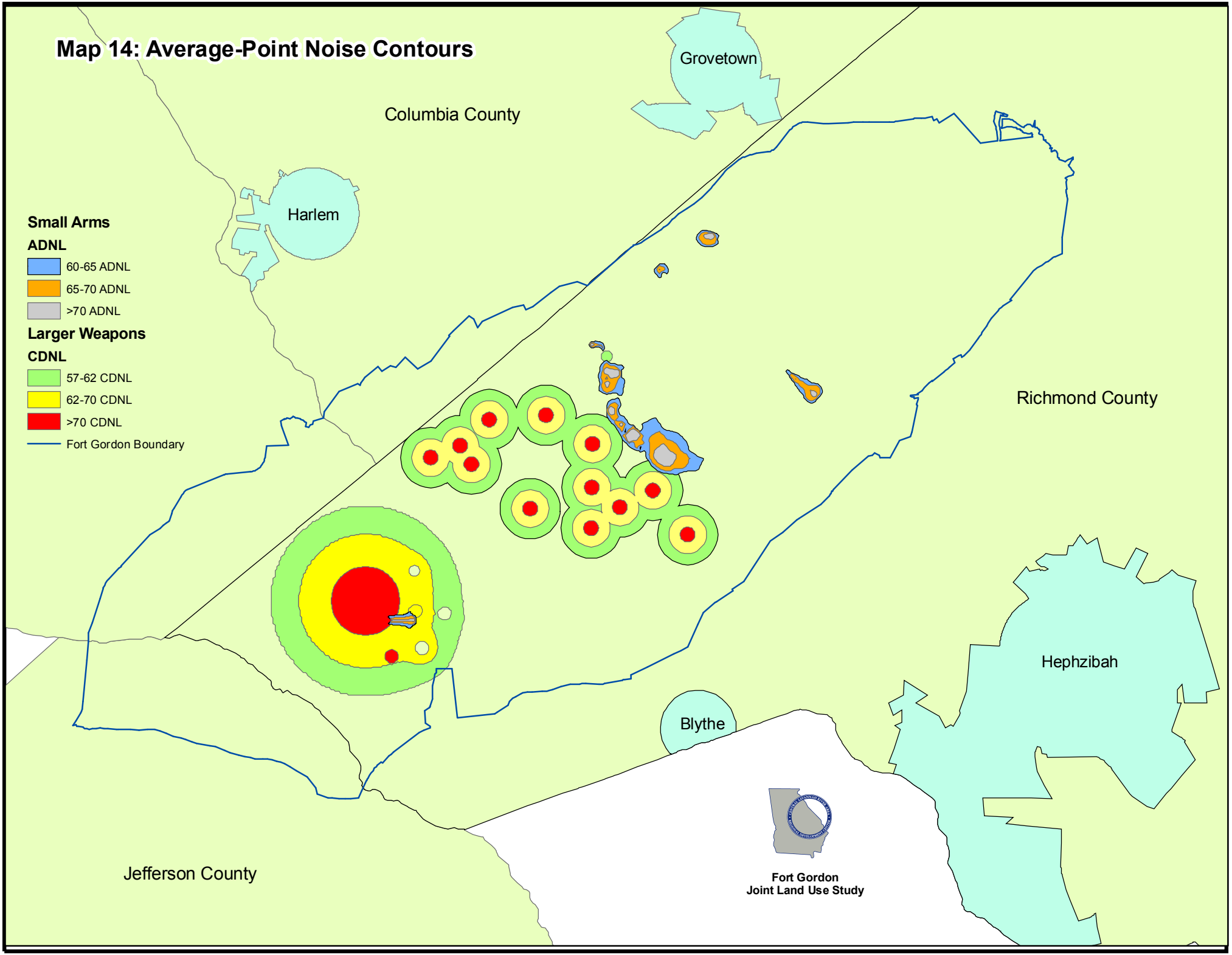
Map 12: Population per Census Block within a 1-mile Radius of Fort Gordon, 2000

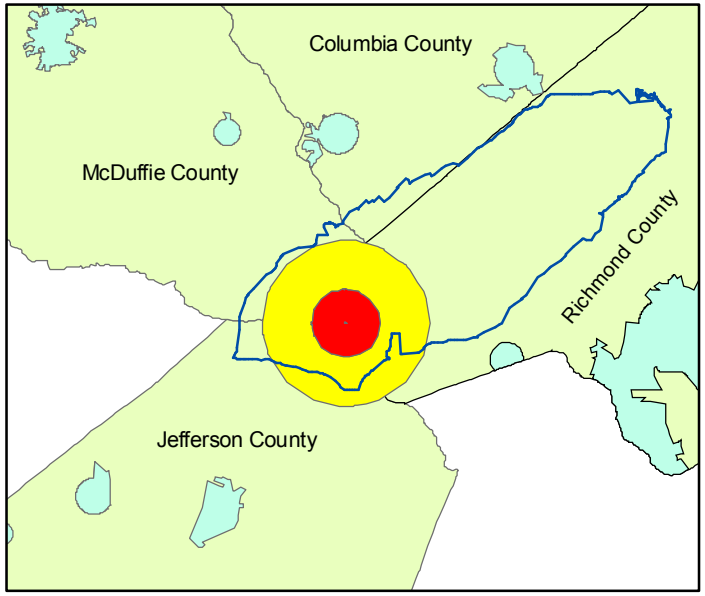


Map 13: Potentially Incompatible Rezonings in Richmond and Columbia Counties, 2000-2004

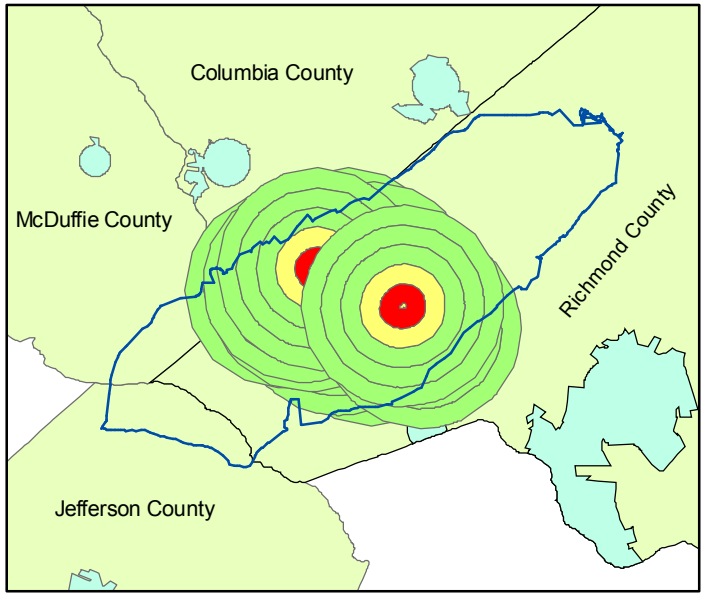



Map 14: Average-Point Noise Contours
Grovetown
Columbia County
Harlem
Small Arms
ADNL
60-65 ADNL
65-70 ADNL
>70 ADNL
Larger Weapons
CDNL
57-62 CDNL
62-70 CDNL
>70 CDNL
Fort Gordon Boundary
Richmond County
Hephzibah
Blythe
Jefferson County
Fort Gordon
Joint Land Use Study

Map 15: Peak-Point Noise Contours



Demolition Noise Contour

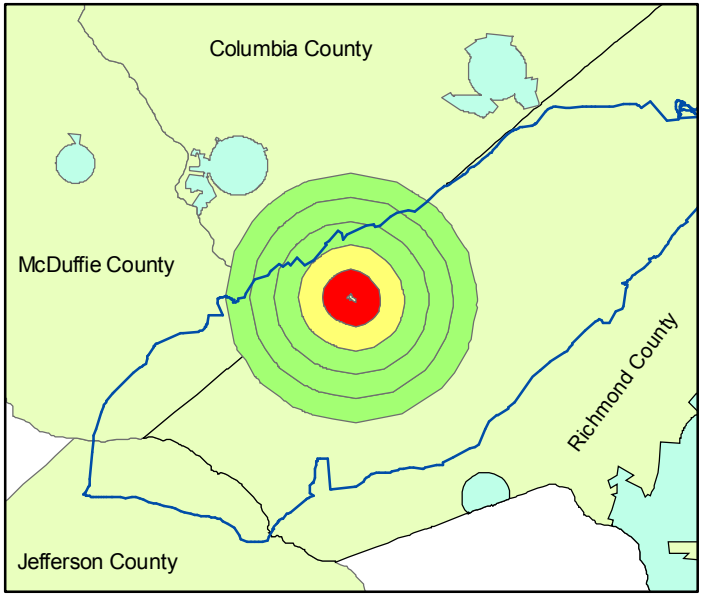


Combined Large Arms Contours

dBP Sound Level

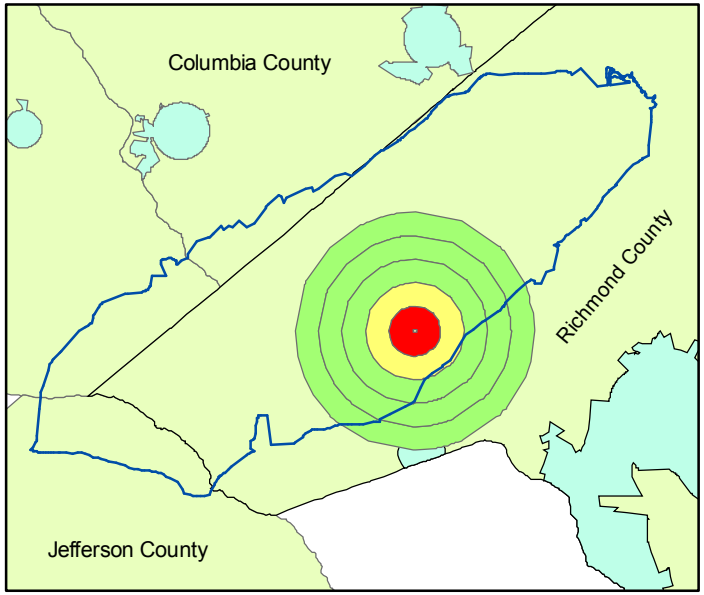
- 105
- 108
- 113
- 119
- 130

< 115 : Low risk of complaints
115-130: Moderate risk of complaints
130-140: High risk of noise complaints, possibility of damage
> 140: Threshold for permanent damage to unprotected ears



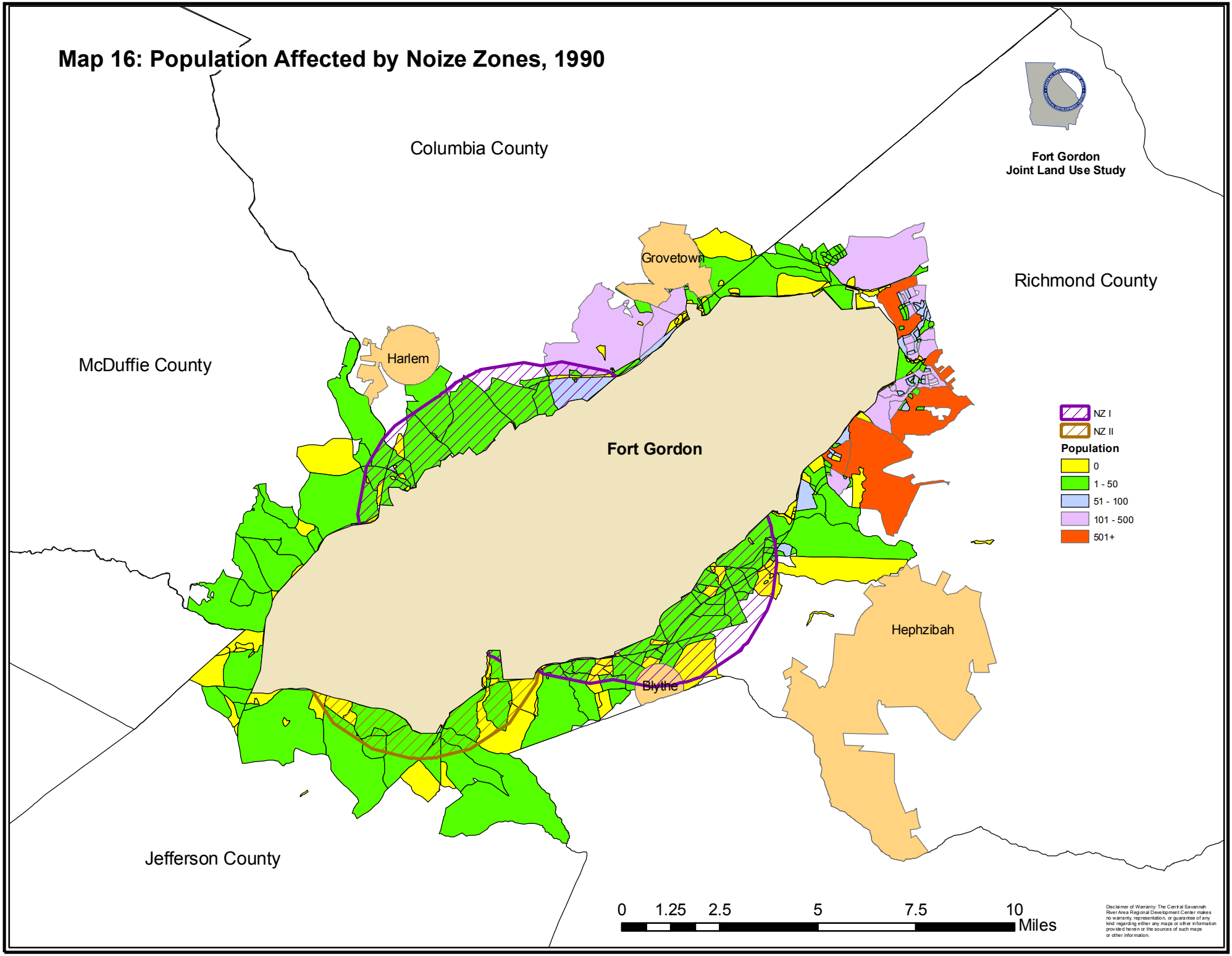
Large Arms Point 10

Fort Gordon
Joint Land Use Study

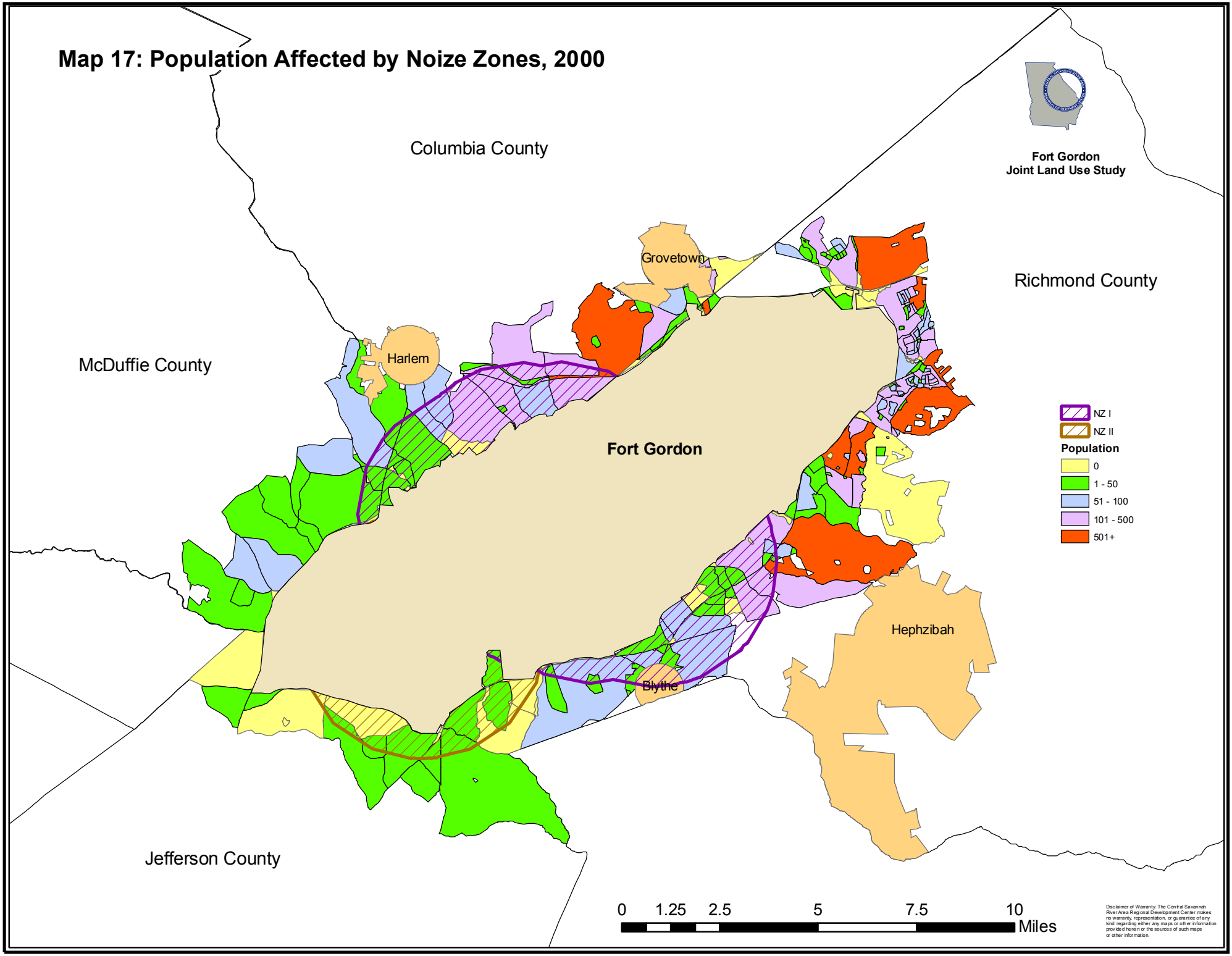


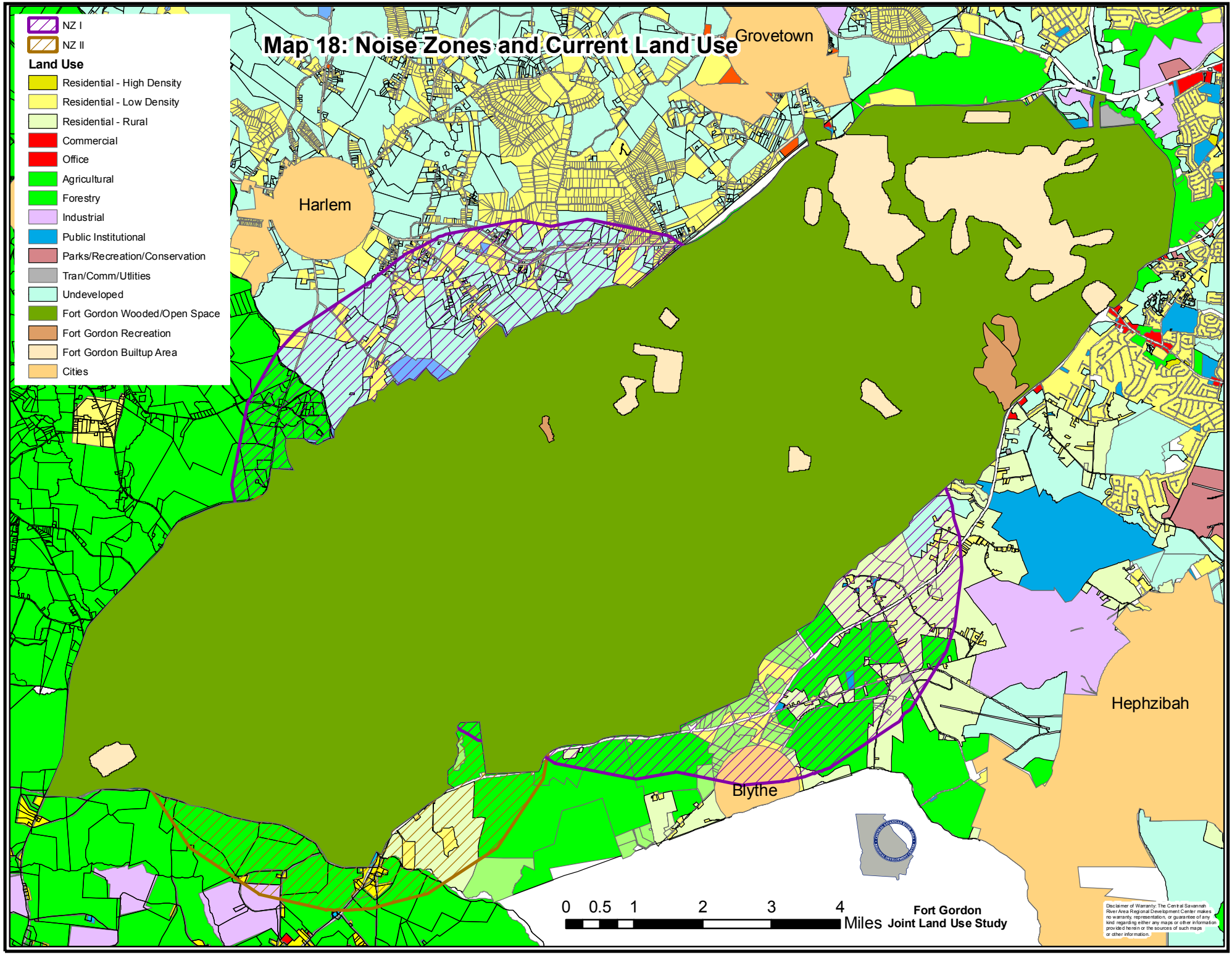
Large Arms Point 12

Map 16: Population Affected by Noize Zones, 1990



Map 17: Population Affected by Noize Zones, 2000




Map 18: Noise Zones and Current Land Use
NZ I
NZ II
Land Use
Residential - High Density
Residential - Low Density
Residential - Rural
Commercial
Office
Agricultural
Forestry
Industrial
Public Institutional
Parks/Recreation/Conservation
Tran/Comm/Utlities
Undeveloped
Fort Gordon Wooded/Open Space
Fort Gordon Recreation
Fort Gordon Builtup Area
Cities
Grovetown
Harlem
Hephzibah
Blythe
0 0.5 1 2 3 4
Miles
Fort Gordon
Joint Land Use Study
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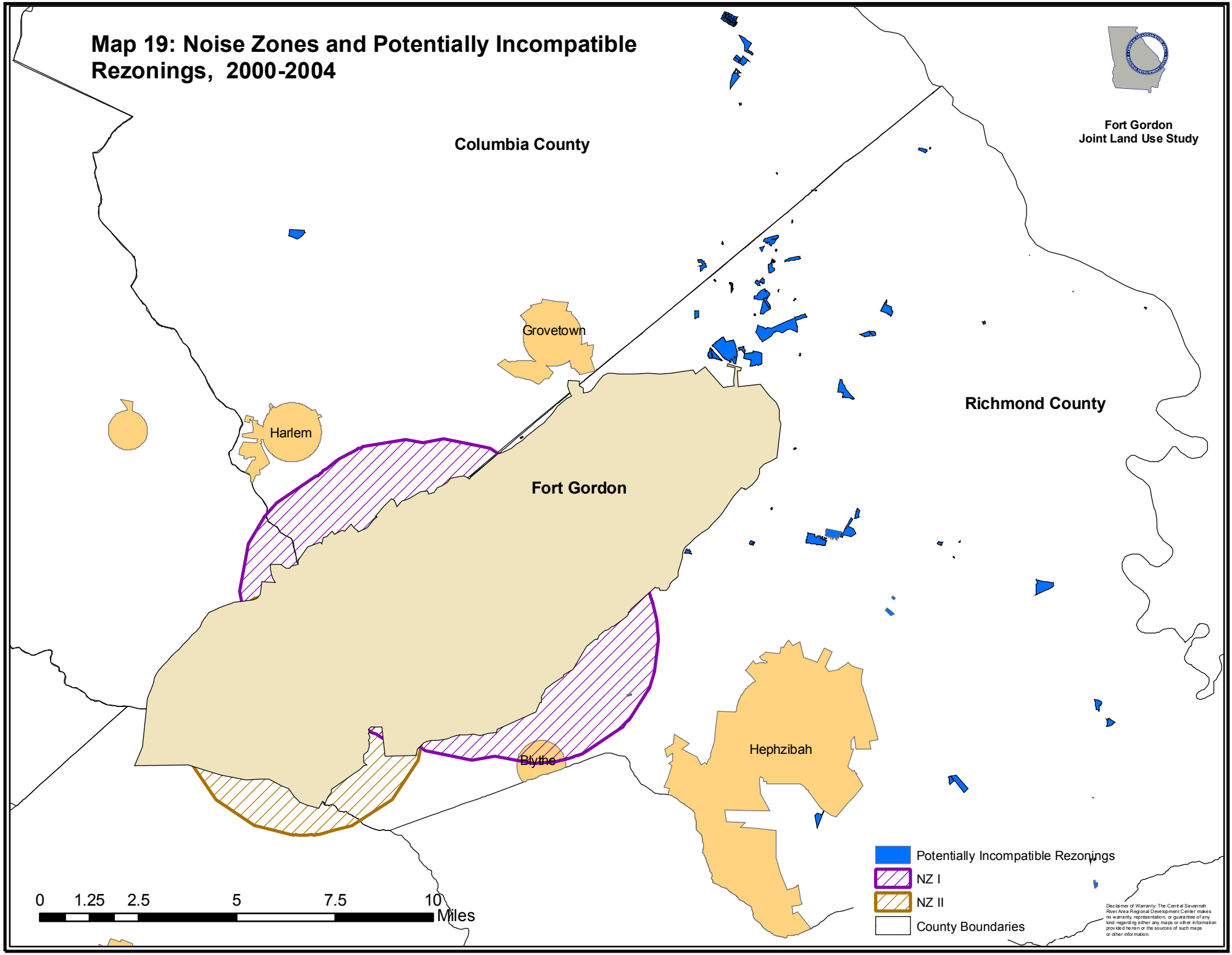
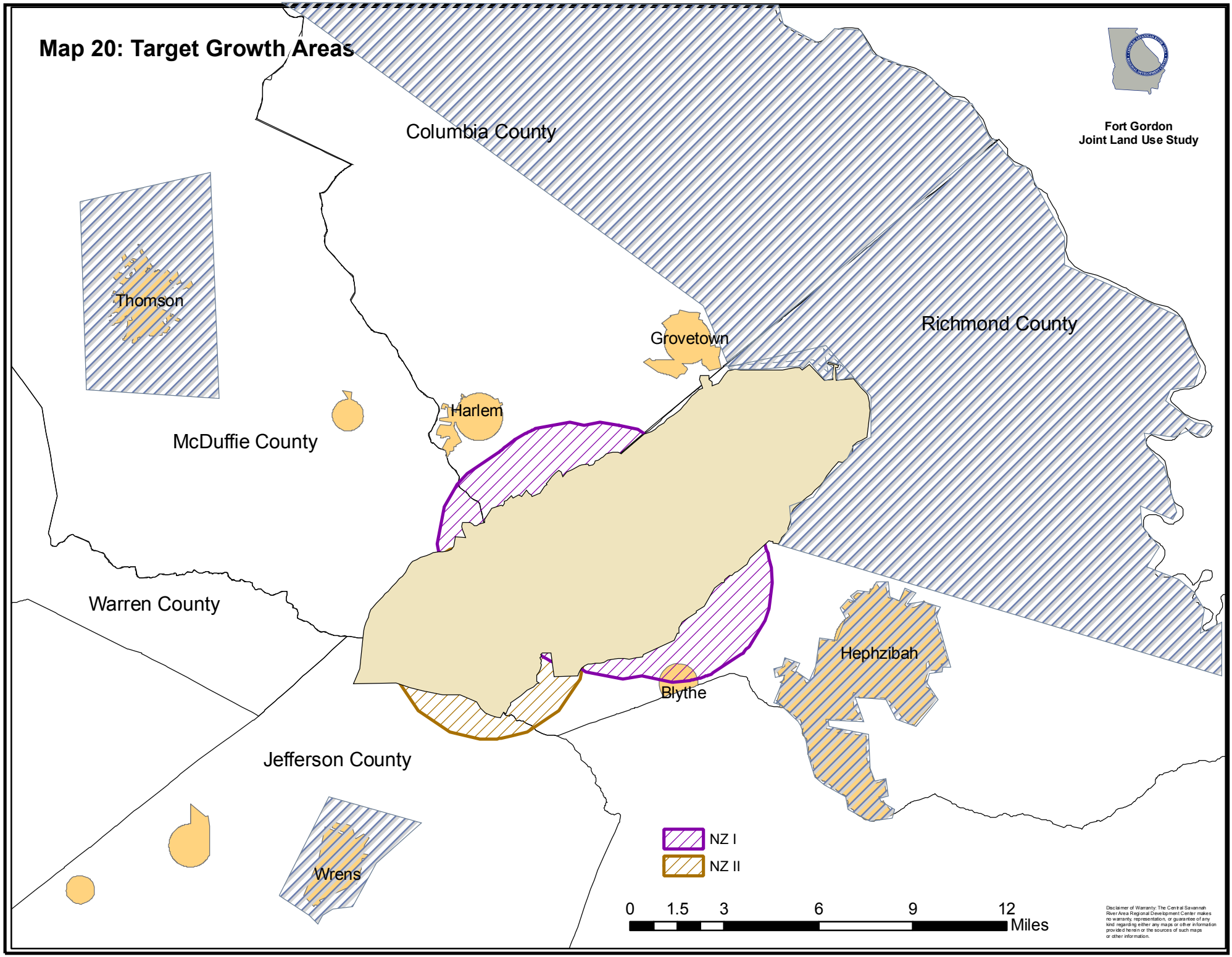
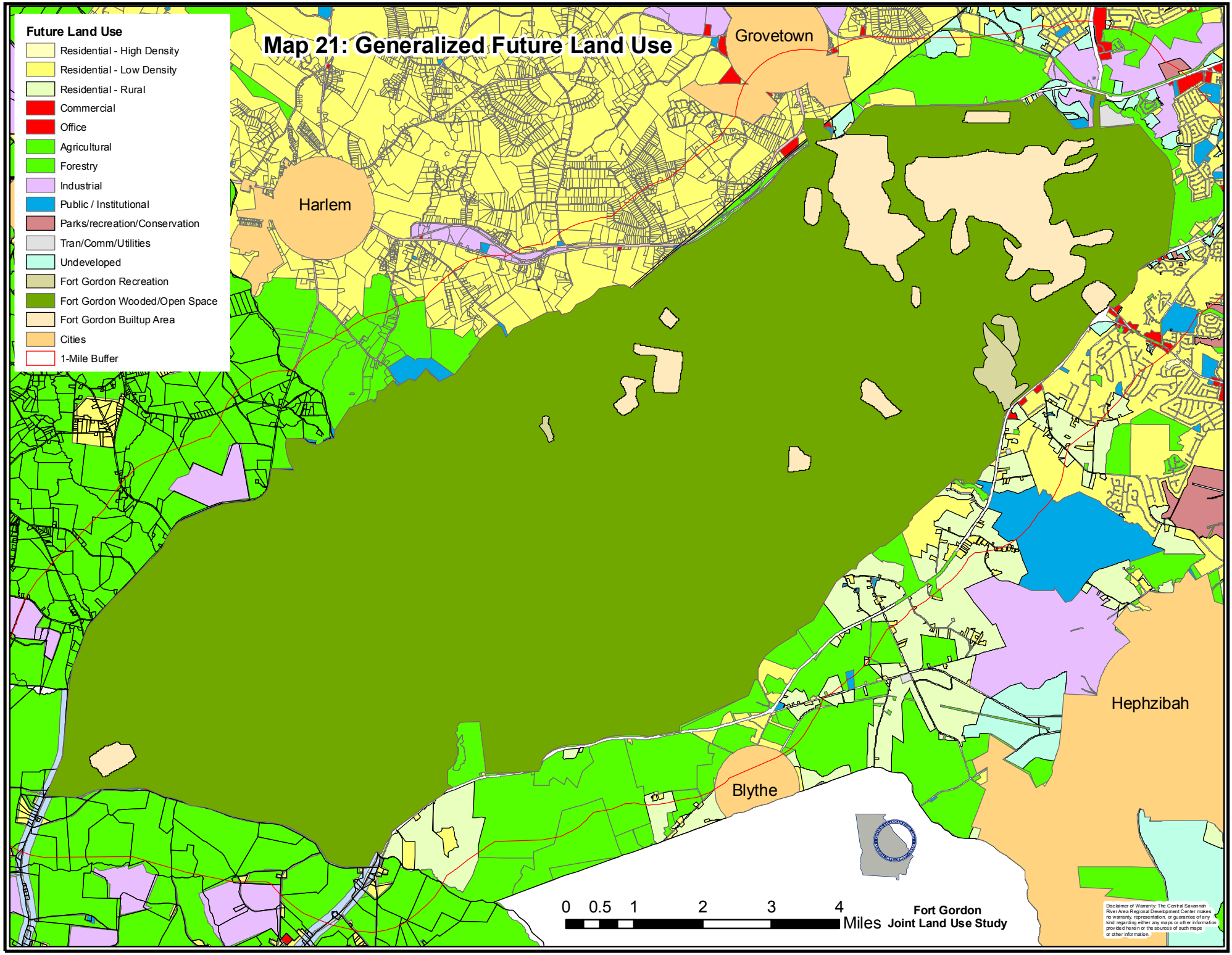
Map 19: Noise Zones and Potentially Incompatible Rezonings, 2000-2004



Map 20: Target Growth Areas




Map 21: Generalized Future Land Use
Future Land Use
Residential - High Density
Residential - Low Density
Residential - Rural
Commercial
Office
Agricultural
Forestry
Industrial
Public / Institutional
Parks/recreation/Conservation
Tran/Comm/Utilities
Undeveloped
Fort Gordon Recreation
Fort Gordon Wooded/Open Space
Fort Gordon Builtup Area
Cities
1-Mile Buffer
Grovetown
Harlem
Blythe
Hephzibah
0 0.5 1 2 3 4
Miles
Fort Gordon
Joint Land Use Study
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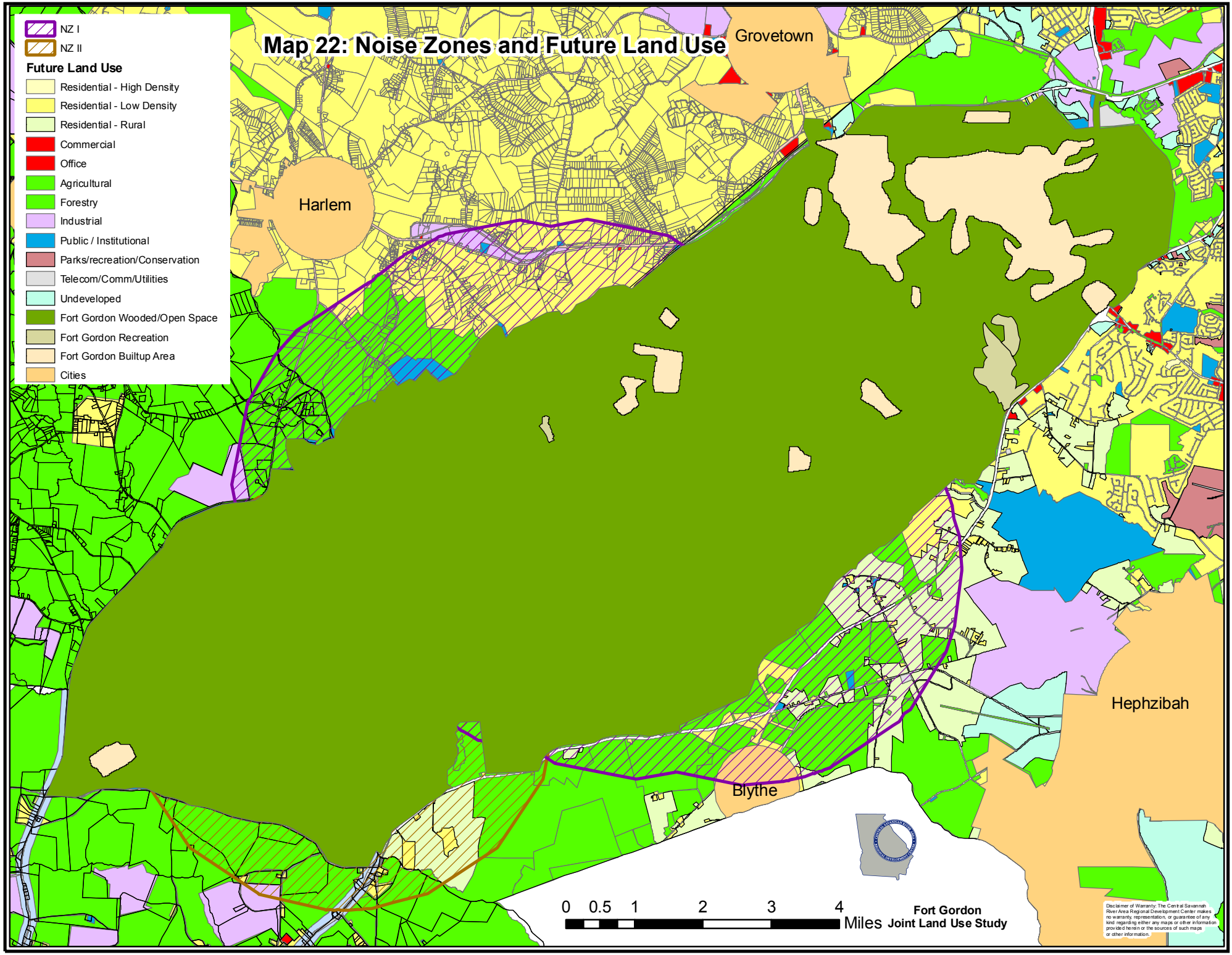
Map 22: Noise Zones and Future Land Use
NZ I
NZ II
Future Land Use
Residential - High Density
Residential - Low Density
Residential - Rural
Commercial
Office
Agricultural
Forestry
Industrial
Public / Institutional
Parks/recreation/Conservation
Telecom/Comm/Utilities
Undeveloped
Fort Gordon Wooded/Open Space
Fort Gordon Recreation
Fort Gordon Builtup Area
Cities
Grovetown
Harlem
Hephzibah
Blythe
0 0.5 1 2 3 4
Miles
Fort Gordon
Joint Land Use Study
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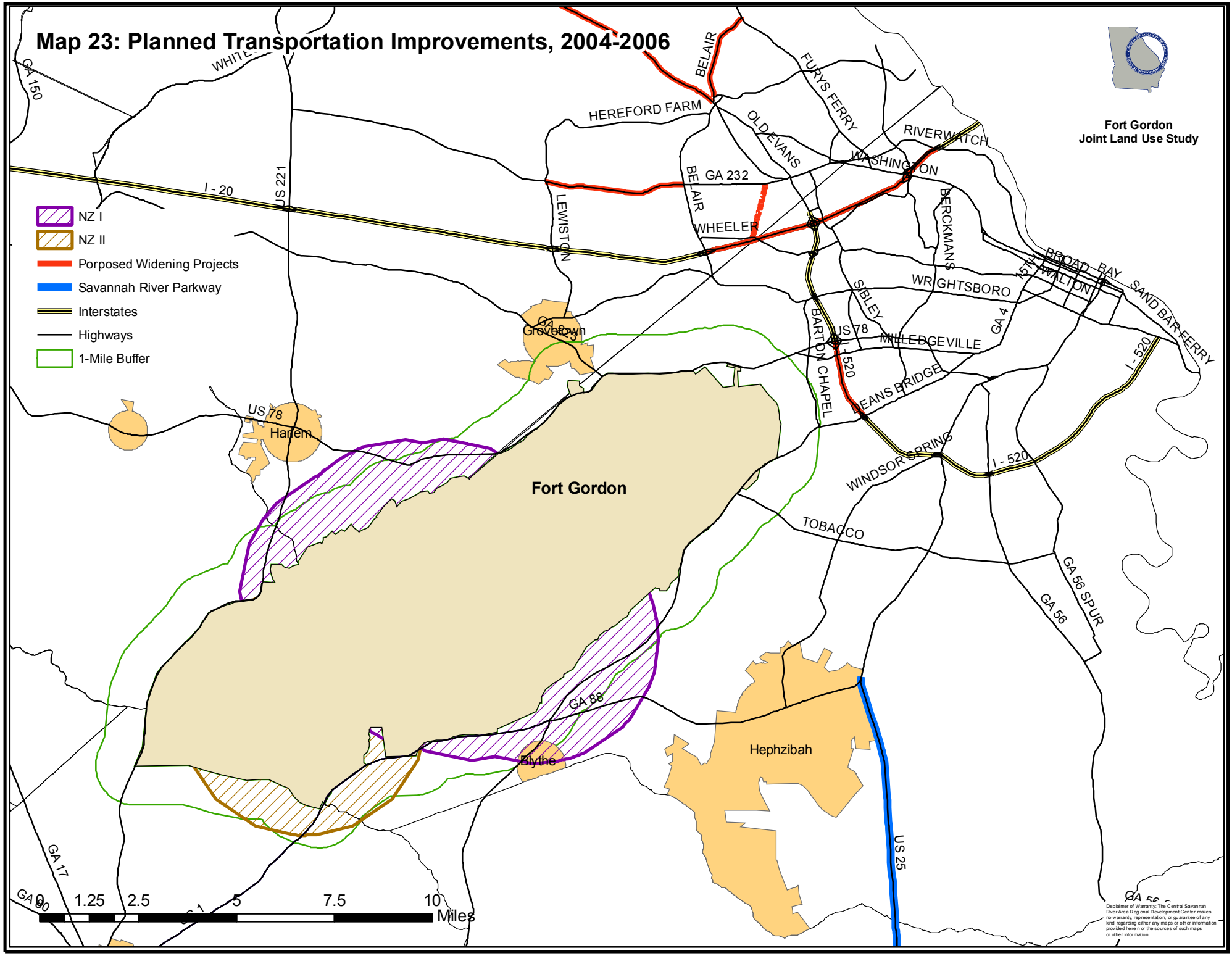
Map 23: Planned Transportation Improvements, 2004-2006



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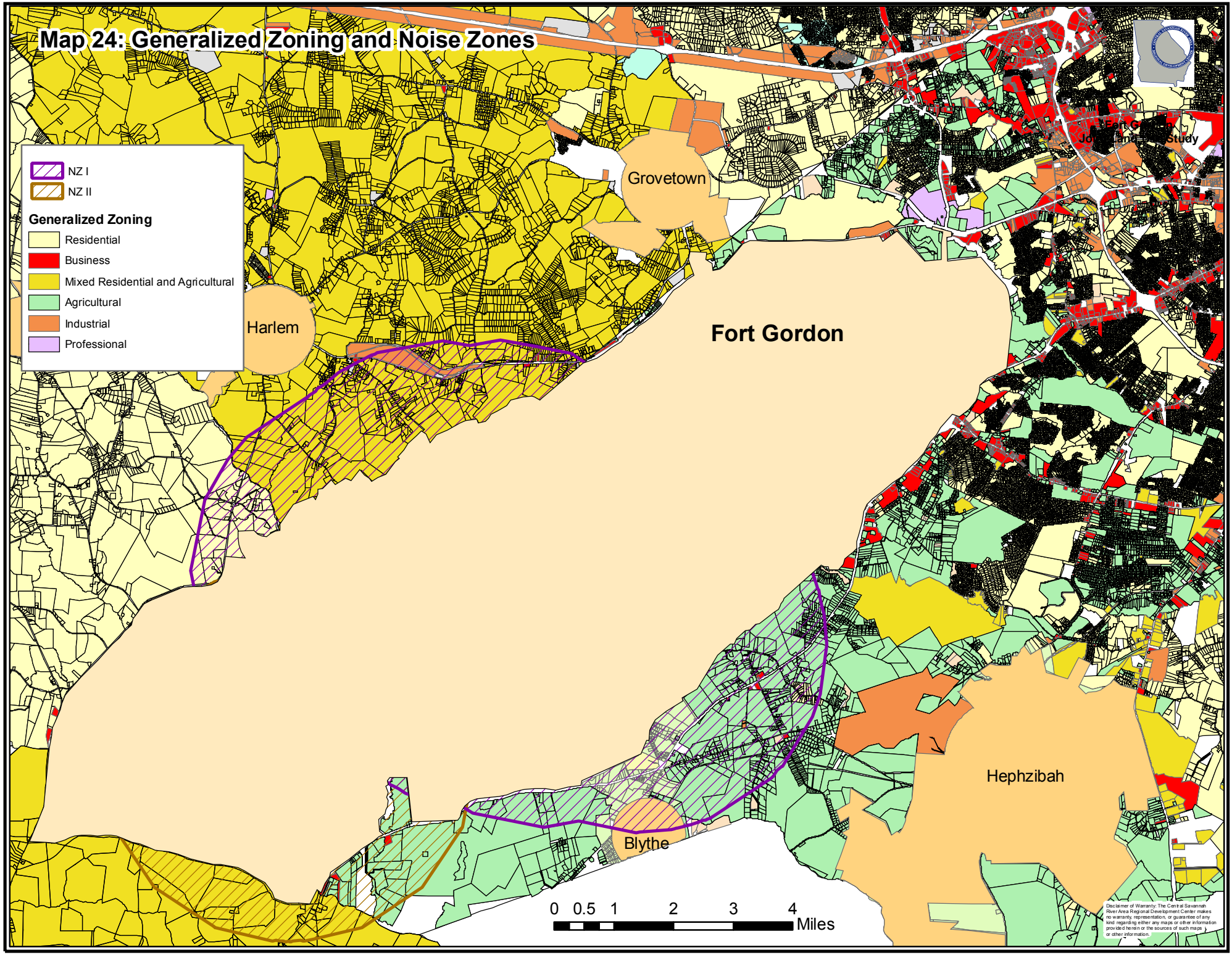
Map 24: Generalized Zoning and Noise Zones
NZ I
NZ II
Generalized Zoning
Residential
Business
Mixed Residential and Agricultural
Agricultural
Industrial
Professional
Grovetown
Harlem
Fort Gordon
Hephzibah
Blythe
0 0.5 1 2 3 4
Miles
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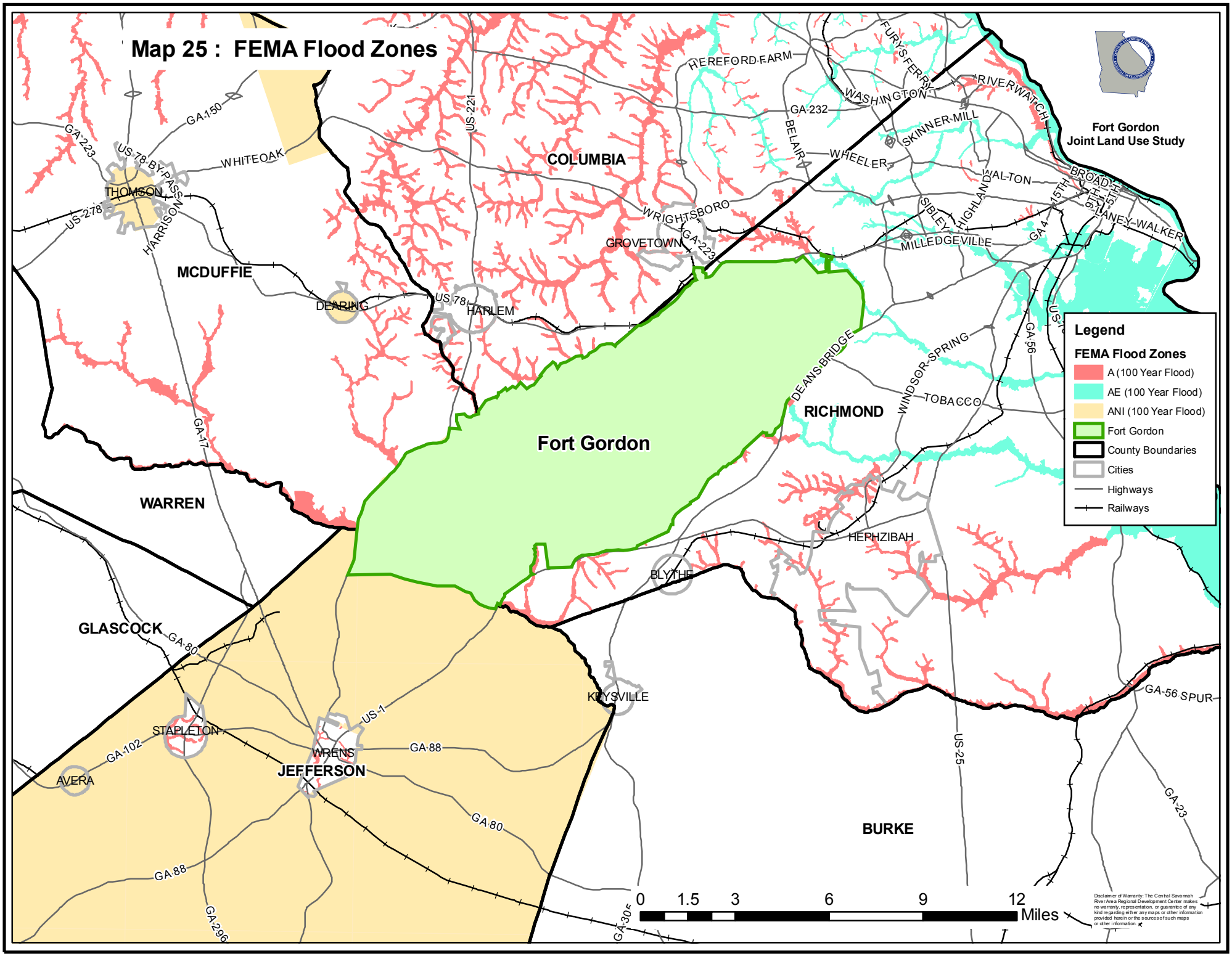
Map 25 : FEMA Flood Zones
Fort Gordon
Joint Land Use Study
COLUMBIA
MCDUFFIE
WARREN
GLASCOCK
JEFFERSON
RICHMOND
BURKE
Fort Gordon
THOMSON
DEARING
HARLEM
GROVETOWN
WRIGHTSBORO
MILLEDGEVILLE
HEPHZIBAH
BLYTHE
KEYSVILLE
STAPLETON
WRENS
AVERA
HEREFORD FARM
FURYS FERRY
WASHINGTON
RIVERWATCH
SKINNER MILL
WHEELER
BELAIR
WALTON
SIBLEY
HIGHLAND
BROAD
15TH
LANEY-WALKER
DEANS BRIDGE
WINDSOR SPRING
TOBACCO
WHITEOAK
HARRISON
US-78 BY-PASS
GA-150
GA-223
US-278
US-221
GA-232
GA-4
GA-56
GA-17
GA-80
GA-102
US-1
GA-88
GA-296
GA-30
US-25
GA-56 SPUR
GA-23
Legend
FEMA Flood Zones
A (100 Year Flood)
AE (100 Year Flood)
ANI (100 Year Flood)
Fort Gordon
County Boundaries
Cities
Highways
Railways
0 1.5 3 6 9 12 Miles
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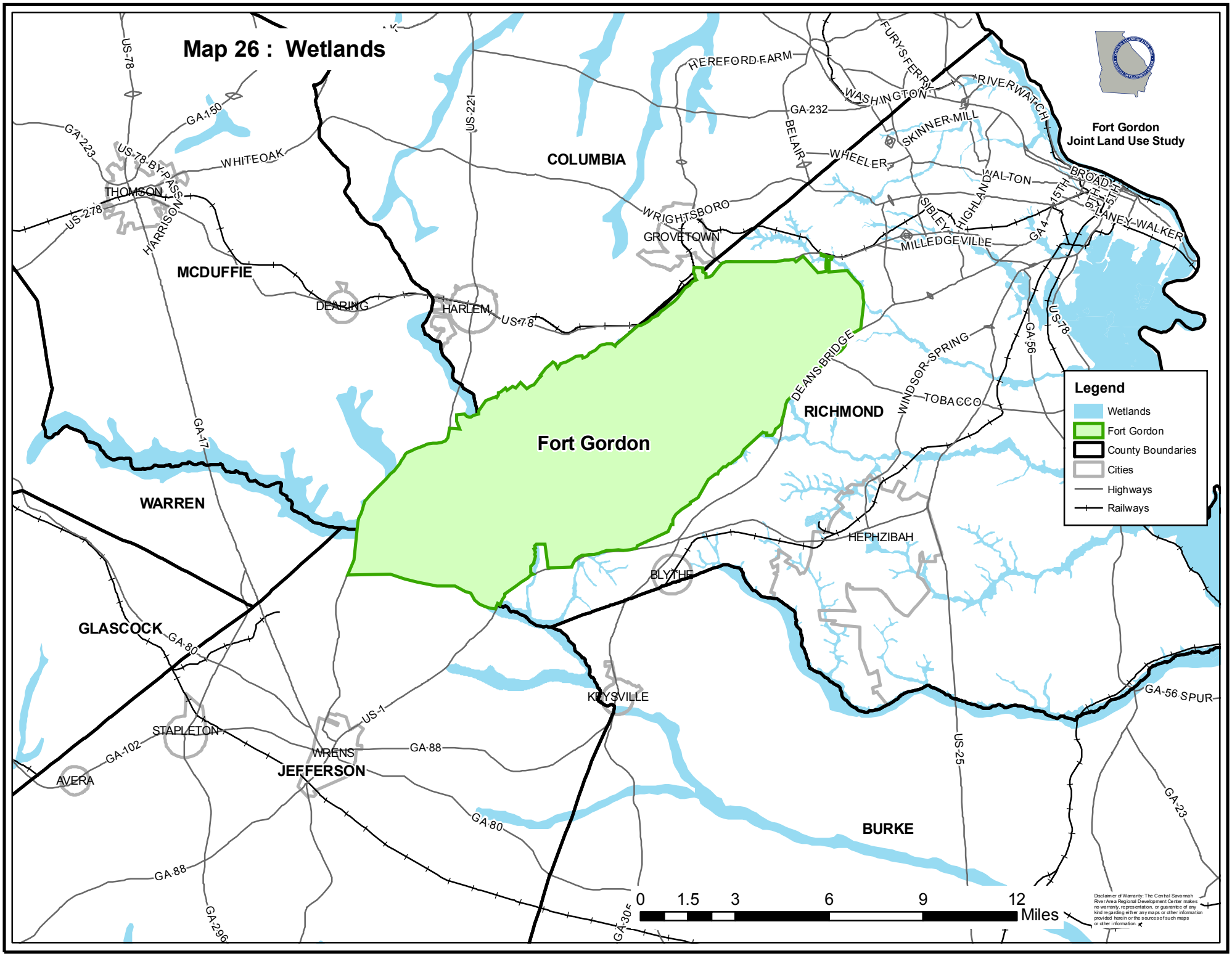
Map 26 : Wetlands
Fort Gordon
Joint Land Use Study
Legend
Wetlands
Fort Gordon
County Boundaries
Cities
Highways
Railways
COLUMBIA
MCDUFFIE
WARREN
GLASCOCK
JEFFERSON
RICHMOND
BURKE
THOMSON
GROVETOWN
WRIGHTSBORO
HARLEM
DEARING
MILLEDGEVILLE
HEPHZIBAH
BLYTHE
KEYSVILLE
WRENS
STAPLETON
AVERA
HEREFORD FARM
FURYS FERRY
WASHINGTON
RIVERWATCH
SKINNER MILL
WHEELER
BELAIR
WALTON
SIBLEY
HIGHLAND
BROADNAX
LANEY-WALKER
15TH
DEANS BRIDGE
WINDSOR SPRING
TOBACCO
WHITEOAK
HARRISON
US-78
US-78 BY-PASS
US-278
GA-150
GA-223
US-221
GA-232
GA-4
GA-56
GA-17
GA-80
GA-102
US-1
GA-88
GA-296
GA-30
US-25
GA-56 SPUR
GA-23
0 1.5 3 6 9 12 Miles
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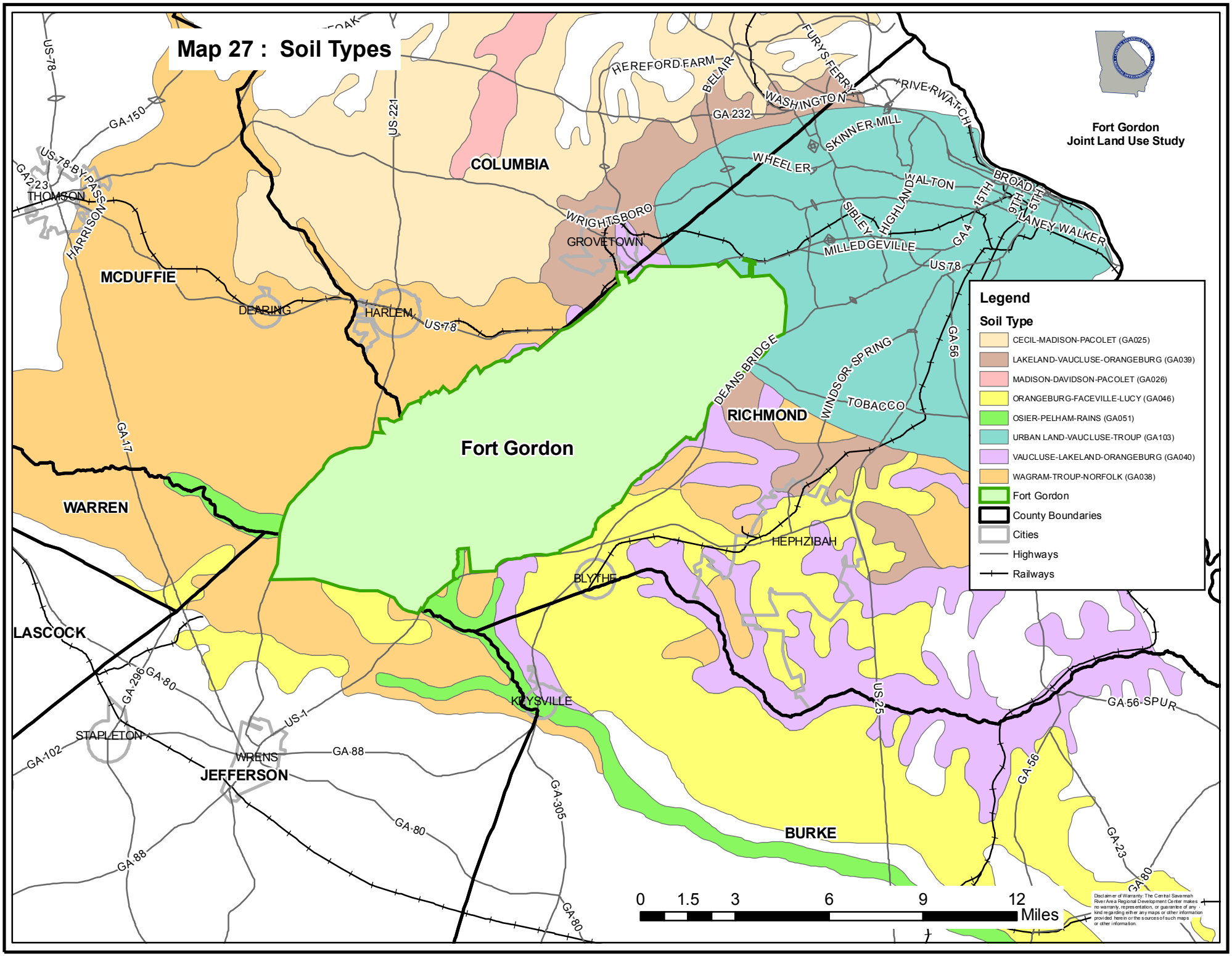
Map 27 : Soil Types
Fort Gordon
Joint Land Use Study
Legend
Soil Type
CECIL-MADISON-PACOLET (GA025)
LAKELAND-VAUCLUSE-ORANGEBURG (GA039)
MADISON-DAVIDSON-PACOLET (GA026)
ORANGEBURG-FACEVILLE-LUCY (GA046)
OSIER-PELHAM-RAINS (GA051)
URBAN LAND-VAUCLUSE-TROUP (GA103)
VAUCLUSE-LAKELAND-ORANGEBURG (GA040)
WAGRAM-TROUP-NORFOLK (GA038)
Fort Gordon
County Boundaries
Cities
Highways
Railways
COLUMBIA
MCDUFFIE
WARREN
LASCOCK
JEFFERSON
BURKE
RICHMOND
Fort Gordon
THOMSON
GROVETOWN
WRIGHTSBORO
HARLEM
DEARING
MILLEDGEVILLE
SKINNER MILL
WHEELER
WALTON
HIGHLAND
SIBLEY
WASHINGTON
HEREFORD FARM
BELAIR
FURYS FERRY
RIVE RWATCH
BROADS
LANEY WALKER
DEANS BRIDGE
WINDSOR SPRING
TOBACCO
HEPHZIBAH
BLYTHE
KEYSVILLE
STAPLETON
WRENS
US-78
GA-150
US-78 BY-PASS
GA-223
HARRISON
US-221
GA-232
GA-4
US-78
GA-56
GA-117
GA-296
GA-80
US-1
GA-102
GA-88
GA-305
US-25
GA-56 SPUR
GA-23
0 1.5 3 6 9 12 Miles
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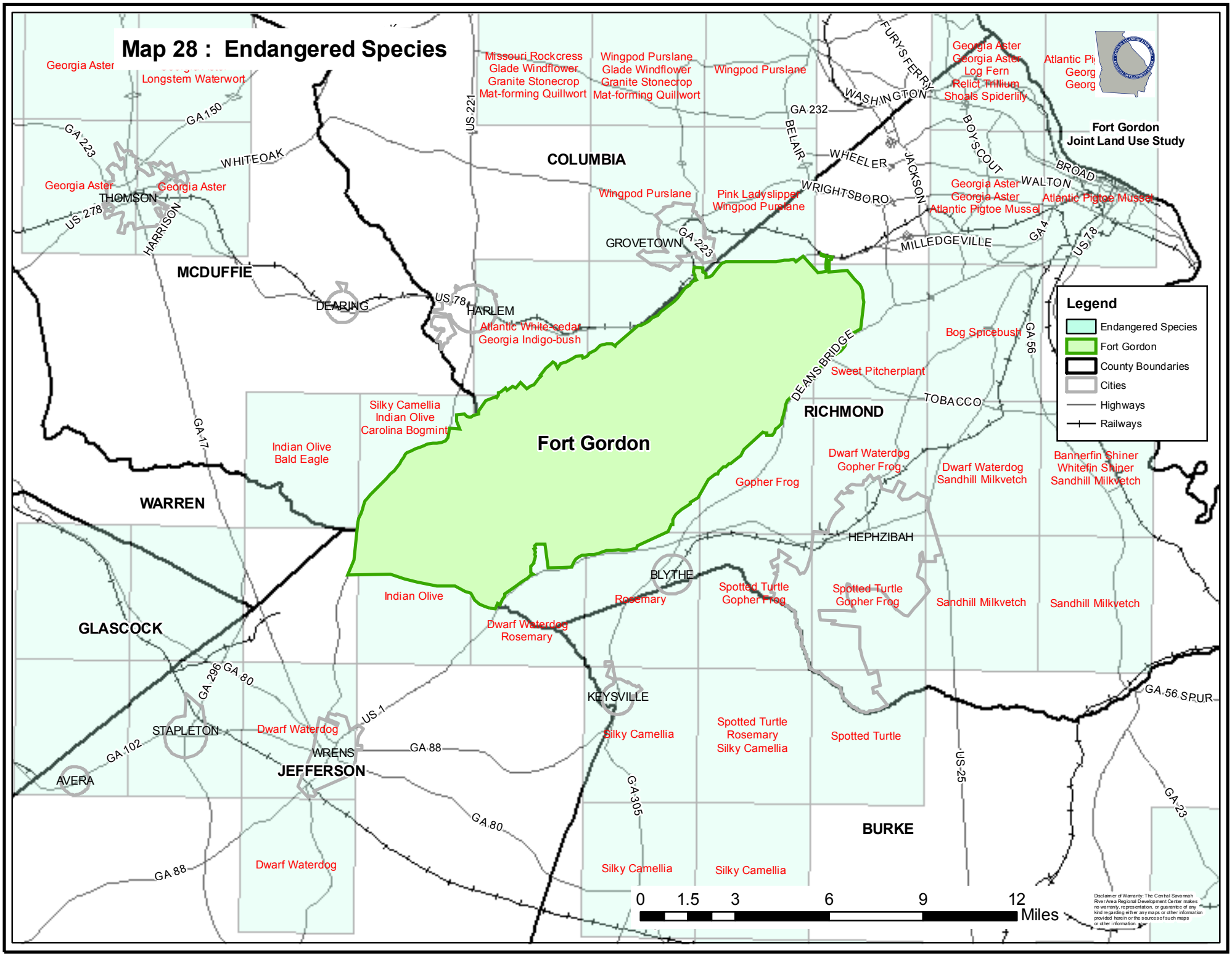
Map 28 : Endangered Species
Fort Gordon
Joint Land Use Study
Legend
Endangered Species
Fort Gordon
County Boundaries
Cities
Highways
Railways
COLUMBIA
MCDUFFIE
WARREN
GLASCOCK
JEFFERSON
RICHMOND
BURKE
WASHINGTON
WHEELER
WRIGHTSBORO
MILLEDGEVILLE
GROVETOWN
HARLEM
DEARING
THOMSON
STAPLETON
WRENS
AVERA
KEYSVILLE
BLYTHE
HEPHZIBAH
WALTON
Georgia Aster
Longstem Waterwort
Missouri Rockcress
Glade Windflower
Granite Stonecrop
Mat-forming Quillwort
Wingpod Purslane
Pink Ladyslipper
Atlantic White-cedar
Georgia Indigo-bush
Silky Camellia
Indian Olive
Carolina Bogmint
Bald Eagle
Dwarf Waterdog
Rosemary
Gopher Frog
Spotted Turtle
Sweet Pitcherplant
Bog Spicebush
Sandhill Milkvetch
Bannerfin Shiner
Whitefin Shiner
Atlantic Pigtoe Mussel
Log Fern
Relict Trillium
Shoals Spiderlily
GA 150
GA 223
WHITEOAK
US 278
HARRISON
US 221
GA 232
BELAIR
JACKSON
FURYS FERRY
BOYSCOUT
BROAD
GA 4
US 78
GA 17
DEANSBRIDGE
TOBACCO
GA 56
GA 296
GA 80
GA 102
US 1
GA 88
GA 305
US 25
GA 56 SPUR
GA 23
0 1.5 3 6 9 12 Miles

Appendix A

Guidelines For Considering Noise in Land Use Planning and Control (FICUN)								
		NOISE ZONES/ ADNL LEVELS						
SLUCM		NZ I	NZ 1	NZ II	NZ II	NZ III	NZ III	NZ III
No.	Land Use	0-55	55-65	65-70	70-75	75-80	80-85	85 +
10	RESIDENTIAL							
11	Household Units	Yes	Yes*	25	30	No	No	No
12	Group Quarters	Yes	Yes*	25	30	No	No	No
13	Residential Hotels	Yes	Yes*	25	30	No	No	No
14	Mobile Home Parks or Courts	Yes	Yes*	No	No	No	No	No
15	Transient Lodgings	Yes	Yes*	25	30	35	No	No
16	Other Residential	Yes	Yes*	25	30	No	No	No
20,30	MANUFACTURING							
21	Food & Kindred Products	Yes	Yes	Yes	Yes	Yes	Yes	No
22	Textile Mill Products	Yes	Yes	Yes	Yes	Yes	Yes	No
23	Apparel/Other Finished Products	Yes	Yes	Yes	Yes	Yes	Yes	No
24	Lumber & Wood Products	Yes	Yes	Yes	Yes	Yes	Yes	No
25	Furniture & Fixtures	Yes	Yes	Yes	Yes	Yes	Yes	No
26	Paper & Allied Products	Yes	Yes	Yes	Yes	Yes	Yes	No
27	Printing, Publishing & Allied Industries	Yes	Yes	Yes	Yes	Yes	Yes	No
28	Chemicals & Allied Products	Yes	Yes	Yes	Yes	Yes	Yes	No
29	Petroleum Refining & Related Industries	Yes	Yes	Yes	Yes	Yes	Yes	No
31	Rubber & Misc. Plastic Products – Manufac.	Yes	Yes	Yes	Yes	Yes	Yes	No
32	Stone, Clay & Glass Products - Manufac.	Yes	Yes	Yes	Yes	Yes	Yes	No
33	Primary Metal Industries	Yes	Yes	Yes	Yes	Yes	Yes	No
34	Fabricated Metal Products – Manufac.	Yes	Yes	Yes	Yes	Yes	Yes	No
35	Professional, Scientific & Controls	Yes	Yes	Yes	25	30	No	No
39	Miscellaneous Manufacturing	Yes	Yes	Yes	Yes	Yes	Yes	No
40	TRANSPORTATIO N, COMMUNICATIONS & UTILTIES							
41	Railroad, Rapid Rail transit & Street Rail	Yes	Yes	Yes	Yes	Yes	Yes	Yes
42	Motor Vehicle Transportation	Yes	Yes	Yes	Yes	Yes	Yes	Yes
43	Aircraft Transportation	Yes	Yes	Yes	Yes	Yes	Yes	Yes
44	Marine Craft Transportation	Yes	Yes	Yes	Yes	Yes	Yes	Yes
45	Highway & Street Right-of-Way	Yes	Yes	Yes	Yes	Yes	Yes	Yes
46	Automobile Parking	Yes	Yes	Yes	Yes	Yes	Yes	No

		NZ I	NZ I	NZ II	NZ II	NZ III	NZ III	NZ III
No.	**Land Use**	**0-55**	**55-65**	**65-70**	**70-75**	**75-80**	**80-85**	**85+**
47	Communications	Yes	Yes	Yes	25	30	No	No
48	Utilities	Yes	Yes	Yes	Yes	Yes	Yes	Yes
49	Other Transportation Communications & Utilities	Yes	Yes	Yes	25	30	No	No
50	**TRADE**							
51	Wholesale Trade	Yes	Yes	Yes	Yes	Yes	Yes	No
52	Retail - Building Materials, Hardware, farm	Yes	Yes	Yes	Yes	Yes	Yes	No
53	Retail - General Merchandise	Yes	Yes	Yes	25	30	No	No
54	Retail - Food	Yes	Yes	Yes	25	30	No	No
55	Retail - Auto, Marine, Aircraft & Parts	Yes	Yes	Yes	25	30	No	No
56	Retail - Apparel & Accessories	Yes	Yes	Yes	25	30	No	No
57	Retail - Furniture, Furnishings & Equipment	Yes	Yes	Yes	25	30	No	No
58	Retail - Eating & Drinking Facilities	Yes	Yes	Yes	25	30	No	No
59	Other Retail Trade	Yes	Yes	Yes	25	30	No	No
60	**SERVICES**							
61	Finance, Insurance & Real Estate Services	Yes	Yes	Yes	25	30	No	No
62	Personal Services	Yes	Yes	Yes	25	30	No	No
62.4	Cemeteries	Yes	Yes	Yes	Yes	Yes	Yes	Yes
63	Business Services	Yes	Yes	Yes	25	30	No	No
64	Repair Services	Yes	Yes	Yes	Yes	Yes	Yes	No
65	Professional Services	Yes	Yes	Yes	25	30	No	No
65.1	Hospitals, Nursing Homes	Yes	Yes	25	30	N	No	No
65.1	Other Medical Facilities	Yes	Yes	Yes	25	30	No	No
66	Contract Construction Services	Yes	Yes	Yes	25	30	No	No
67	Government Services	Yes	Yes	Yes	25	30	No	No
68	Educational Services	Yes	Yes	25	30	No	No	No
69	Miscellaneous Services	Yes	Yes	Yes	25	30	No	No
70	**CULTURAL, ENTERTAINMENT & RECREATIONAL**							
71	Cultural Activities Including Churches	Yes	Yes	25	30	No	No	No
71.2	Nature Exhibits	Yes	Yes	Yes	No	No	No	No
72	Public Assembly	Yes	Yes	Yes	No	No	No	No
72.1	Auditoriums, Concert Halls	Yes	Yes	25	30	No	No	No
72.11	Outdoor Music Shells, Amphitheaters	Yes	Yes	No	No	No	No	No
72.2	Outdoor Sports Arenas, Spectator Sports	Yes	Yes	Yes	Yes	No	No	No
73	Amusements	Yes	Yes	Yes	Yes	No	No	No

		NZ I	NZ I	NZ II	NZ II	NZ III	NZ III	NZ III
No.	**Land Use**	**0-55**	**55-65**	**65-70**	**70-75**	**75-80**	**80-85**	**85+**
74	Recreational Activities	Yes	Yes	Yes	25	30	No	No
75	Resorts, Groups & Camps	Yes	Yes	Yes	Yes	No	No	No
76	Parks	Yes	Yes	Yes	Yes	No	No	No
79	Other Cultural, Entertainment & Recreational	Yes	Yes	Yes	Yes	No	No	No

Legend

SLCUM — Standard Land Use Coding Manual

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[x] 30[x] 35[x] — 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 Although local conditions may require 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 considered prior to approvals.

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 reduction requirements are often stated as 5, 10 or 15dB over standard construction and normally assume mechanical ventilation and closed windows year round. Additional consideration should be given to modifying NLR based on peak noise levels.

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 preferences to measure which 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 the community decides use in necessary, hearing protection devices should be worn by personnel.

Appendix B

Acronyms

AAQTF: Augusta Air Quality Task Force
AFG: Alliance for Fort Gordon
AHPA: Archaeological and Historic Preservation Act
AIA: Artillery Impact Area
AIT: Advanced Infantry Training
ALRFP: Army Long-Range Facilities Plan
ALRPG: Army Long-Range Planning Guidance
AR: Army Regulation
ARTS: Augusta Regional Transportation Study
ASIP: Army Stationing and Installation Plan
AWP: Annual Work Plan
AWR: Augusta Watershed Roundtable
BRAC: Base Realignment and Closure
CAA: Clean Air Act
CG: Commanding General
CSRA: Central Savannah River Area
CSRA RDC: Central Savannah River Area Regional Development Center
CWA: Clean Water Act
DCA: Department of Community Affairs
DDEAMC: Dwight David Eisenhower Army Medical Center
DIM: Directorate of Information Management
DIS: Directorate of Installation Support
DMWR: Directorate of Morale, Welfare, and Recreation
DOD: Department of Defense
DPTM: Directorate of Plans, Training and Mobilization
DPWL: Directorate of Public Works & Logistics
DRI: Development of Regional Impact
EAC: Early Action Compact
ENMP: Environmental Noise Management Plan
ESA: Endangered Species Act
FAAA: Federal Aid to Airports Act
FAHA: Federal Aid to Highways Act
FHA: Federal Housing Administration
FORSCOM: Forces Command
FWCA: Fish and Wildlife Coordination Act
FWPCA: Federal Water Pollution Control Act
GAO: Government Accountability Office
GMACC: Georgia Military Affairs Coordinating Committee
GPA: Georgia Planning Act
HUD: Housing and Urban Development

ICUZ: Installation Compatible Use Zone
IENMP: Installation Environmental Noise Management Plan
JLUS: Joint Land Use Study
OEA: Office of Economic Adjustment
OSJA: Office of the Staff Judge Advocate
MACOM: Major Command
MBTA: Migratory Bird Treaty Act
MPO: Metropolitan Planning Organization
NCA: Noise Control Act
NEPA: National Environmental Policy Act
NHPA: National Historic Preservation Act
NWRSAA: National Wildlife Refuge System Administration Act
PBG: Program and Budget Guidance
PAIO: Plans, Analysis and Integration Office
PAO: Public Affairs Office
POM: Program Objective Memorandum
QCA: Quiet Communities Act
RMP: Resource Management Plan
RPMP: Real Property Management Plan
RPPB: Real Property Planning Board
SAFETEA: Safe, Accountable, Flexible and Efficient Transportation Equity Act
SAIA: Small Arms Impact Area
SAMAS: Structure and Manpower Allocation System
SDWA: Safe Drinking Water Act
TAP: The Army Plan
TRADOC: Training and Doctrine Command
UDA: Unified Development Authority
URR: Unconstrained Requirements Report
USAMC: United States Army Medical Command
USANGC: United States Army National Guard Command
USASC: United States Army Signal Center
USASCFG: United States Army Signal Center and Fort Gordon
VA: Veterans Administration
WQA: Water Quality Act
WSRA: Wild and Scenic Rivers Act

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