Fort A.P. Hill and the Surrounding Localities:  

A Joint Land Use Plan and Process 

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FORT A.P. HILL AND THE SURROUNDING LOCALITIES –

A JOINT LAND USE PLAN AND PROCESS

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EXECUTIVE SUMMARY

Fort A.P. Hill is experiencing growth and future expansions, much like the region it resides in. Each of the localities (Caroline, Essex, King George, Spotsylvania and Stafford Counties as well as the Towns of Bowling Green and Port Royal) is experiencing residential growth and is anticipating and planning for an increase in both residential and commercial growth. Fort A.P. Hill is expecting its training mission to continually be strengthened in the coming years, calling for the Post to train more soldiers each year.

Future growth of the localities and Fort A.P. Hill has an effect on each other. The localities need to make land use decisions that are compatible with the operations of Fort A.P. Hill. The Post, as well, needs to understand the localities future needs and development patterns in order to expand appropriately in the context of the Region. Appropriate development by these entities will protect the resident’s quality of life and allow the Post to carry out its mission.

The current state of affairs, in terms of compatible land use with military operations, is encouraging. Presently, there are not widespread conflicts. The region surrounding Fort A.P. Hill is generally rural. Agricultural land and large lot residential land uses make up a majority of the land uses within a three-mile distance of the Post. Recently, as the region’s population growth has escalated, commercial and higher density residential developments have begun to move closer to the Post. This is cause for concern.

Another concern is the likely pattern of future growth. The locality’s future land use designations continue to raise compatibility issues with Fort A.P. Hill. Residential, commercial and public uses are planned for areas around the Post that are affected by both noise and safety impacts. Until now, compatibility with the Post has not been a concern of the localities. But, as the Post and its mission are strengthened, these concerns are magnified. As more residents live, work and shop in close proximity to Fort A.P. Hill, there is a greater likelihood of complaints and distress over military operations.

The relationships between the localities and Fort A.P. Hill are not fully formed. The relationships and the planning processes that exist vary by locality. Caroline County, where the Post resides, has the strongest relationship and the most functional planning process. Fort A.P. Hill has the ability to review and comment on rezoning applications in the County and intermittently supplies the County with data on military operations. Other localities, like Spotsylvania and Essex Counties have an informal relationship with
Fort A.P. Hill, but are kept abreast of the military operations. Stafford and King George Counties have no relationship with Fort A.P. Hill.

Due to the small town nature of the Town of Port Royal, there are minimal interactions with the Post. There has very little development within the town limits, making a formal planning process unnecessary. On the other hand, the Town of Bowling Green has been making great progress towards the development of a proper relationship and planning process with Fort A.P. Hill. Bowling Green is eager to continue the development of its vacant land and wishes it to be beneficial for both the Town and the Post.

In order to achieve compatible land uses, recommendations have been made for the implementation of a formalized planning process, including the types of information exchanged and the oversight needed to maintain this process. A mutually beneficial relationship must be realized between each locality and the Post to achieve compatible development. A preferred land use plan has also been generated, balancing the locality’s need to grow and the military’s operational impacts. Six goals have been established to work towards compatible land use.

- **Goal 1** – A collaborative relationship exists between each locality and Fort A.P. Hill.

  This goal and its corresponding objectives and strategies establish the formal planning process. A Joint Planning Committee is established, a Memorandum of Agreement is signed by each locality and Fort A.P. Hill, and a Department of Defense funded Joint Land Use study is pursued. This goal also sets up a role for Fort A.P. Hill in each locality’s comprehensive planning update process and development review.

- **Goal 2** – There is a structured flow of information between Fort A.P. Hill, the localities and the public.

  This goal in conjunction with objectives and strategies defines the types of data to be developed and distributed by Fort A.P. Hill to the localities and to the public. Fort A.P. Hill develops data to aid the localities in making proper land use decisions. Public awareness of military operations is increased through literature, public presentations and a staffed noise hotline. Developers and property/home buyers are also targeted, with Fort A.P. Hill and the localities providing them with all information that may affect their purchase.

- **Goal 3** – Conservation efforts will be continued around Fort A.P. Hill.
This goal establishes conservation as a priority to both the Post and to the localities. Increasing the recruitment of partners and funding strengthens the existing program. Priorities are developed to better focus the efforts of the partnership. The public and landowners are informed of the ongoing conservation efforts including programs available to permanently conserve their land.

- **Goal 4** – Compatible land uses are determined and enforced through the comprehensive plan and zoning ordinance of each locality.

  This goal and its objectives and strategies integrate the newly created land use plan into each locality’s comprehensive plan. Desired density and land use requirements are laid out to avoid future land use conflicts with Fort A.P. Hill. Existing land use conflicts are also targeted, by providing landowners with information on co-existing with the Post and in certain cases, the option of acquisition. Zoning is also used, by amending the current zoning ordinance to reflect the comprehensive plan changes and through the use of flexible zoning.

- **Goal 5** – The utilization of new tools will assist in the compatible development around Fort A.P. Hill.

  This goal employs the use of new tools to achieve compatible development around Fort A.P. Hill. Real estate disclosure, a light ordinance, noise management techniques and new site plan requirements will assist the localities and Fort A.P. Hill in their work.

- **Goal 6** – Operational modifications are incorporated by Fort A.P. Hill to minimize noise and safety impacts experienced by the localities.

  This goal requires Fort A.P. Hill to look into the modification of their operations to support development in the localities. This includes further noise mitigation measures and well as flight path modifications.

Overall, the initiatives set forth by this plan would be proactive steps for the localities and Fort A.P. Hill to take in preventing encroaching development and conflicting land uses. Encroaching development is not an imminent threat for the realignment or closure of Fort A.P. Hill, but it is necessary to prevent the situation from escalating to such an extreme. With the engagement and commitment of each locality and Fort A.P. Hill, a shared, mutually beneficial vision can be realized. The early stages of the process have already begun, as Fort A.P. Hill has initiated discussions and distributed information on
their noise and safety contours over the last several months. Localities have been more receptive to listening and understanding the installation’s concerns. Continued communication along with the application of this plan can provide the Region and the installation a beneficial future together.
INTRODUCTION

The RADCO region, which is made up of the Counties of Caroline, King George, Stafford and Spotsylvania and the City of Fredericksburg, is located in Central Virginia between the Nation’s capital and Richmond, the Commonwealth’s capital. This strategic location has led to staggering population growth over the last fifteen years. From 1990 to 2000 the region’s population increased by 41%, making it the fastest growing region in Virginia. It continues this growth today, expanding by over 20% between 2000 and 2005. Two localities in particular, Stafford and Spotsylvania, added 25,000 people to their locality over that same time period (Weldon Cooper Center, 2006). Essex County is also part of the study area for this project, but is not within the RADCO region. Essex County is part of the Middle Peninsula Region, which has not experienced the level of growth like the RADCO region. The Middle Peninsula Region placed as the eighth fastest growing region out of 21 between 2000 and 2005, with growth at less than 5% (Weldon Cooper Center, 2006). Essex County, during the same timeframe (2000 and 2005) only grew by 3%.

This tremendous growth adds pressure to the region – on its transportation and utility infrastructure, its historic and cultural resources, its air quality and open space. Increased pressure is also felt by the region’s military installations. Quantico Marine Corps Base, in Stafford County, the Naval Surface Warfare Center in King George County and Fort A.P. Hill in Caroline County are battling growth and development as well. As the region shifts from rural to a suburban community, more businesses, residents and tourists are attracted to the region. At the same time, the military’s presence in the region has been strengthened by the Base Realignment and Closure (BRAC) process and the ever-increasing demand to secure our nation’s readiness. Inevitably, the military presence conflicts with the community’s sprawling growth. This results in more residents living and working in proximity to accident and noise zones generated by military installations.

The military installation this plan is focused on is Fort A.P. Hill, which is a 76,000 acre Army training installation that lies in the northern portion of Caroline County. The installation shares 85% of its boundary with Caroline County to the north, south and west. The final 15% of its border, to the east is shared with Essex County. The overall study region, as shown in Map 1 consists of those localities that lie in close proximity to Fort A.P. Hill. These localities are Caroline, Essex, King George, Spotsylvania, Stafford Counties, the City of Fredericksburg and the incorporated towns of Bowling Green and Port Royal.
Fort A.P. Hill was located in rural Caroline County in 1941. For over 60 years, Fort A.P. Hill has served as one of the nation’s premier all-purpose, year-round, field training destinations. As Caroline County begins the transition from rural farms and agricultural land to a more suburban community, Fort A.P. Hill is working to continue its mission in the middle of a growing locality. Similarly, the surrounding localities are expecting and planning for continued growth, both residential and commercial. Future development is critical to each locality to grow and sustain their tax base. These needs and expectations require a balancing act between Fort A.P. Hill’s mission and future expansion and the economic sustainability of each locality surrounding it.
Map 1: The Study Region of Caroline, King George, Essex, Spotsylvania and Stafford Counties; The City of Fredericksburg and the Towns of Bowling Green and Port Royal

Map created by Beth J. Payne, VCU, January 2006
**Study Purpose**

This plan addresses the early stages of encroaching development on Fort A.P. Hill. This situation has been experienced by other military installations across the country, with various levels of success. Achieving compatible land uses around Fort A.P. Hill involves coordination, open dialogues and visioning of the military along with the neighboring jurisdictions. The region’s awareness of the military’s mission is critical to establish the proper balance of growth and regulation. Compatible land uses are necessary to further both the community’s and the military’s goals. A suitable planning process is needed to realize such a vision. With established lines of communication and proper procedures, both the localities and Fort A.P. Hill can successfully work toward a compatible future.

**Project Goals**

This plan has a stated purpose. To accomplish the purpose and produce a plan, a process has been developed, followed and documented. It utilized the following steps:

- Compile and analyze existing plans and studies to identify existing data, data needs and existing tools in use for compatible land uses between Fort A.P. Hill and the surrounding communities.
- Compile noise and safety contours from Fort A.P. Hill and existing and future land use patterns to identify conflicts and areas of concern around the Post.
- Identify land uses that are compatible, acceptable and feasible in the three mile study area around the Post.
- Investigate the current planning relationship between Fort A.P. Hill and its surrounding localities.
- Produce a plan with an overall vision as well as goals, objectives and strategies that works toward compatible physical land use in the three mile study area surrounding the Post.
- Identify existing and develop new land use planning and zoning tools, strategies and techniques to further land use compatibility with consideration given to the military, the localities as well as private landowners.
- Identify improvements and determine planning steps that both the localities and Fort A.P. Hill can take to work towards a more integrated, joint planning process.
- Develop an implementation plan based on compatibility criteria, land use patterns, and identified tools that prevent encroachment and achieve compatibility. This will further the Post’s mission and increase the quality of life for local residents.
Participation

During the course of this planning process, planning staff from all localities within the study area were contacted. Their input and experience supplemented the information gained from existing plans and ordinances. Their ideas on compatibility, communication and integration were critical to the development of the plan. The Public Affairs Office as well as the Environmental Division at Fort A.P. Hill played a large role in this process. By supplying data and reviewing the document for accuracy, the Post ensured that their mission and impacts were correctly represented by this document. Numerous other people played a role in the development of this plan, providing data where needed. This includes private developers, county and town officials and other county staff.

Origination

This plan is being prepared for Virginia Commonwealth University (VCU) to fulfill requirements to obtain a Masters in Urban and Regional Planning, specifically for URSP 762.
MILITARY ENCROACHMENT

The issue of encroachment around existing military installations has been a highly publicized topic, of late. Previously, the issue of encroachment around specific military bases was dealt with on a case by case basis. Over the last five years there has been a slow but steady increase in problems threatening and successfully limiting specific military installation’s missions. A majority of the problems have been associated with encroaching development. Because of this, encroachment has been recognized by the federal government, each branch of the military, local governments and residents of those communities that are home to military installations. Studies have been completed by the Department of Defense to better understand all aspects of encroachment and its effects on national readiness.

Unfortunately, encroachment limits the military’s ability to safely and effectively train its soldiers, test its weapons technology and, most importantly, maintain national readiness. Often times, the military’s mission cannot be contained within the boundaries of its installation. The operations extend their environmental footprint to lands they do not own or control. As military operations spill over their boundaries, their effects are felt by neighboring communities in terms of noise, pollution and safety concerns. As encroachment escalates and moves closer to the military installation, these effects are magnified.

Military encroachment is defined as the collective impact of pressures placed on military installations, the surrounding communities and the environment, as a consequence of the growing development and urbanization around military facilities (ECOS, 2004). Essentially it is a competition for scarce resources, focusing on land. There are multiple components that make up encroachment. The environment, safety issues and technology can each infringe on the military’s lands. The environment can invade military lands; an example is the designation of critical habitats and endangered species. Though unintentional, this reduces the military’s flexibility in utilizing their land to carry out their mission. Currently, there are over 300 federally listed endangered plant and animal species found on military installations, with more anticipated (US GAO, 2002). The military’s success at maintaining largely undeveloped training lands has caused them to become critical habitats for at-risk species.

Additional environmental threats are based on the requirements to balance ocean resource protection mandates with military training operations. With the growing number of marine regulations and controls, the military’s training operations may be constrained. The same is true of the application of the Clean Air Act, whose regulations
can hinder training by placing limits on emissions generated by its training activities. Smoke training, controlled burns and specific weapons training may well exceed Clean Air standards for a particular area (attainment vs. non attainment areas).

Like the Clean Air Act, there are other federal mandates that could hamper military training. A clear example of this was the 1997 executive action taken under the Safe Drinking Water Act. It terminated live-fire training on the Massachusetts Military Reservation because of unexploded ordnance and munitions constituents leaching into drinking water in the surrounding areas (US GAO, 2002).

Another facet of encroachment is the competition for resources, both technological and natural. The growth in consumer telecommunications has caused the military to compete within the frequency spectrum. There has been increasing pressure to reallocate radio frequency from the federal to non federal control. There is also competition for airspace. Increased demands from the commercial airline industry have limited the military’s ability to test and train pilots and weapons.

One of the most significant components of encroachment and the subject of this plan is the unplanned and incompatible use of the land surrounding military installations. Infringing urban growth can compromise the health, safety and welfare of military and civilian life. The increased number of housing units and people located around military installations cross into zones of military use, including noise from small arms fire and explosives, aircraft flight paths, and light. Residents and property owners begin to feel as if the military is interfering with their property rights and harming their quality of life. As a result, the military installation’s mission may be hampered.

State and local governments designate and maintain land use controls, often times, independently of the military’s presence. The Code of Virginia gives local governments the authority to make land use decisions. Other entities around the Commonwealth are not given that power, thus Fort A.P. Hill has no authority to make land use decisions. While the military may have no authority, it is critical to both the nation’s military and local communities that these issues be tackled jointly. As the demands of war, peacekeeping missions and humanitarian efforts escalate, the missions of the military will only increase in intensity. Planning for these situations, now and in the future, can help to determine the appropriate land uses and work to limit, if not prevent the instances of encroachment.
Base Realignment and Closure

Encroachment is battled across the nation. It is felt by states in all parts of the country and by all branches of the military in one or many ways. Some military installations have persevered and overcome the issues, continuing their tenure. Other installations have not been so fortunate and have succumbed to the growing pressures of encroachment. Most often, these installations are realigned or closed. The Base Realignment and Closure (BRAC) process is one of many reasons why encroachment maintains an elevated status of importance. The BRAC Commission was created to provide an objective, thorough, accurate, and non-partisan review and analysis, through a process determined by law, of the list of bases and military installations which the Department of Defense (DoD) has recommended be closed and/or realigned. The Commission is required to assess each recommendation to ensure it meets the eight selection criteria set forth by Congress in P.L. 108-375.

Recommendations by DoD that substantially deviate from these selection criteria can be modified or rejected by the Commission by a simple majority vote of the Commissioners. The Commission can also add installations to the closure or realignment list recommended to the President, but only through a process in which seven of nine Commissioners vote to do so, the Secretary of Defense is properly notified in writing 15 days prior to the proposed change, and only after at least two Commissioners physically visit the military installation in question (BRAC, 2005).

There are eight criteria by which the military bases are reviewed. They are set forth by the Under Secretary of Defense. The criterion (BRAC, 2005) regarding "military value” is given top priority.

Military Value Criteria

1. The current and future mission capabilities and the impact on operational readiness of the total force of the Department of Defense, including the impact on joint warfighting, training, and readiness.
2. The availability and condition of land, facilities, and associated airspace (including training areas suitable for maneuver by ground, naval or air forces throughout a diversity of climate and terrain areas and staging areas for the use of the Armed Forces in homeland defense missions) at both existing and potential receiving locations.
3. The ability to accommodate contingency, mobilization, surge, and future total force requirements at both existing and potential receiving locations to support operations and training.
4. The cost of operations and the manpower implications.
Other Considerations

5. The extent and timing of potential costs and savings, including the number of years, beginning with the date of completion of the closure or realignment, for the savings to exceed the costs.

6. The economic impact on existing communities in the vicinity of military installations.

7. The ability of the infrastructure of both the existing and potential receiving communities to support forces, missions and personnel.

8. The environmental impact, including the impact of costs related to potential environmental restoration, waste management, and environmental compliance activities.

The last BRAC process occurred in 2005. The previous rounds of BRAC were in 1988, 1991, 1993 and 1995. These four rounds resulted in 97 major closures, 55 major realignments and 235 minor actions, according to DoD figures. Overall, closing and realigning these installations saved taxpayers around $18 billion through fiscal year 2001 and a further $7 billion per year since (U.S. DoD, 2005). The results from the 2005 BRAC process are the most aggressive to date, affecting over 800 installations around the country.

Oceana Naval Air Station

One military installation that proves to be a textbook case study of the dangers of encroachment, in terms of unplanned and incompatible land uses, is Naval Air Station (NAS) Oceana. NAS Oceana is located in Virginia Beach, Virginia. It has grown to become one of the largest and most advanced air stations in the world, comprised of 6,820 acres (Global Security.org, 1998). There are four runways, which are designed for high-performance aircraft. NAS Oceana’s primary mission is to train and deploy the Navy’s fighter and attack squadrons – the F14 Tomcats and FA18 Hornets (Global Security.org, 1998).

Since NAS Oceana was established in the 1950’s, the surrounding community has drastically changed. Virginia Beach grew into a diverse community, with a diverse economy. Over the past two decades, it became less dependent on the Navy’s economy. Population grew dramatically, much of it in close proximity to NAS Oceana. Residential and commercial development around Oceana greatly increased as a result of the 1995 BRAC process, which redirected assets from MCAS Cherry Point, NC and MCAS Beaufort, SC to Oceana. The relocation of operations and personnel to Oceana brought new residents and commercial activity to the area.
The 2005 BRAC Commission handed down a heavy sentence to the City of Virginia Beach. It was determined by the Commission that the continued encroachment was having a detrimental effect on the operations of the military installation as well as on the welfare and safety of Virginia Beach residents. The Commission stated that the State of Virginia as well as the municipal governments of Virginia Beach and Chesapeake must take immediate steps to halt encroaching developments pending before them now and in the future and to roll back encroachment that has already occurred in the Accident Potential Zones around NAS Oceana and NALF Fentress (Global Security.org, 2005). More importantly, the DoD and the BRAC commission determined that the severe encroachment problems were directly caused by the state and local governments as they repeatedly ignored the Navy’s objections to the incompatible residential and commercial developments in the Accident Potential Zones. The Commission stated that as a result, no federal funds can be used to halt and reverse encroachment around NAS Oceana. Funds must come from State and Local sources.

BRAC recommendations state that by the end of March 2006, the Commonwealth of Virginia and the governments of Virginia Beach and Chesapeake must enact and enforce legislation to prevent further encroachment. If they fail to do so, NAS Oceana will be realigned by relocating the East Coast Master Jet Base to Cecil Field, Florida.

These findings highlight the issue that military value will be degraded as encroachment instances steadily increase around military bases. NAS Oceana may be an extreme example, due to its degree of encroachment, but many installations may find themselves in this situation in decades to come.
PART I – ASSESSMENT OF EXISTING CONDITIONS AND THE CURRENT PLANNING PROCESS
REGIONAL DATA

Population Growth

The study region, of Caroline, King George, Spotsylvania and Stafford Counties; the City of Fredericksburg and the Towns of Bowling Green and Port Royal (The RADCO region) and Essex County, is rapidly growing. The RADCO region’s population has grown over 20% between the years of 2000 – 2005. (Weldon Cooper Center, 2005) The region is experiencing this growth in a disproportionate pattern, with Stafford and Spotsylvania Counties gaining a majority of the new residents. They, along with the City of Fredericksburg, have become the urban center of the Region. Most recently, the rural localities of Caroline and King George Counties are experiencing fast paced growth. In March 2005, Caroline and King George County were placed on the list ‘100 Fastest-Growing U.S. Counties by Percentage Growth, July 1, 2004 to July 1, 2005’. King George County is ranked ninth, with a 6.7% increase in population, while Caroline County ranked tenth, with a 6.5% population increase (Free Lance Star, March 2006). As shown in Table 1, the projections for the area indicate rapid population growth over the coming years.

Table 1: Population Growth and Projections by Locality

<table>
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<tr>
<th>Localities</th>
<th>1990</th>
<th>2000</th>
<th>2010</th>
<th>2020</th>
<th>2030</th>
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<td>19,027</td>
<td>19,279</td>
<td>20,400</td>
<td>21,400</td>
<td>22,400</td>
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<td>Caroline County</td>
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<td>22,121</td>
<td>25,200</td>
<td>27,900</td>
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<td>9989</td>
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<td>King George County</td>
<td>13,527</td>
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<td>Spotsylvania County</td>
<td>57,403</td>
<td>90,395</td>
<td>125,000</td>
<td>153,000</td>
<td>181,400</td>
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<tr>
<td>Stafford County</td>
<td>61,236</td>
<td>92,446</td>
<td>127,900</td>
<td>154,700</td>
<td>180,400</td>
</tr>
</tbody>
</table>

Source: Census Bureau and Weldon Cooper Center
Development Trends

The overall development trends in the Study Region have followed major transportation corridors. State Route 610 in northern Stafford County, U.S. 17 in southern Stafford County, State Route 3 in the City of Fredericksburg and Spotsylvania County have the highest densities in the Region. Future growth is likely to continue this pattern of development, with State Route 2 in Spotsylvania County as well as Route 1 in Caroline County beginning to exhibit similar patterns.

Growth is also beginning to spread southward, along the I-95 corridor. Massaponnax (exit 126), in the central portion of Spotsylvania County is home to several new retail complexes; over 2 million square feet are to be built out in the next several years. The more rural counties of Caroline and King George have emerged as new residential destinations. In Caroline County there have been several residential developments approved which when complete, could add up to 6,000 homes (Finchum, 2006). The residential building permits issued over the last five years illustrate the increases, as shown in Table 2.

In the rural portions of the region a typical pattern of development has prevailed, which is low density and auto-oriented. This type of development sprawls across thousands of acres of open space, consuming agricultural land and precious historic resources. Sprawl does not meet the challenges of enormous population growth. Congestion on the roadways, imbalance of jobs and housing, lack of parks and open space as well as destruction of our historic and cultural resources are common outcomes from this pattern of development. Military installations also feel the pressure of sprawl.

Table 2: Residential Building Permits Issued from 2000 to 2005

<table>
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<tr>
<th>Localities</th>
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<td>Spotsylvania County</td>
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<td>1,368</td>
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</table>
Environmental, Cultural and Historic Resources

The Rappahannock River runs directly through the study area and borders each county, attributing to numerous floodplains and wetlands in the study area. Also, in each of these localities, the Chesapeake Bay Act is enforced. Resource Protection Areas as well as Resource Management Areas are designated in each locality to protect critical resources along tributaries of the Chesapeake Bay. These areas have corresponding development restrictions.

There are two state parks within the study region, Caledon in King George County and Lake Anna State Park in the southern portion of Spotsylvania County. Pettigrew, in Caroline County, is a Wildlife Management Area under the direction of the Virginia Department of Game and Inland Fisheries. Lands End Waterfowl Refuge is located along the banks of the Rappahannock River in King George County and boasts the densest bald eagle breeding population in the lower 48 states (DGIF, 2004). Caroline County is also home to the Port Royal Unit of the Rappahannock River Valley Wildlife Refuge which protects critical floodplain habitat on the river’s edge.

The region is also home to numerous cultural and historic resources. The National Park Service maintains over 9,000 acres in the Fredericksburg and Spotsylvania National Military Park, which includes the Civil War battlefields at Fredericksburg, Chancellorsville, Spotsylvania Courthouse and Wilderness. There are historically significant places scattered throughout the study area. Eighty-nine places are listed on the National Register of Historic Places, including the Historic District in the towns of Bowling Green, Port Royal and Tappahannock (NPS: National Register of Historic Places, 2006). These historic districts of Bowling Green and Port Royal are located in very close proximity to Fort A.P. Hill, nearly abutting the installation’s boundaries.
FORT A.P. HILL

History

Fort A.P. was originally established after the War Plans Division of the Army General Staff developed a plan to raise a national army of four million men for operations in both Europe and the Pacific. In 1940, the search began for an area suitable for training facilities. It was Lt. Col. Oliver Marston, an officer stationed in Richmond, Virginia who completed the investigation of the Bowling Green area of Caroline County. It was his recommendation to the War Department in 1940 to purchase the land.

General Order No. 5, issued by the War Department, established the Fort A.P. Hill Military Reservation on June 11, 1941. It was named in honor of Lt. Gen. Ambrose Powell Hill, a Virginia native who was a Confederate Commander during the Civil War.

Since its creation, Fort A.P. Hill has played an integral role in the peace and wartime activities in the United States. In the fall of 1942, the installation was used as the staging area for the headquarters and corps troops of Major General Patton’s Task Force A, which invaded French Morocco in North Africa. During the Korean War, Fort A.P. Hill was a major staging area for units deploying to Europe, which included men from the VII Corps Headquarters and the Third Armored Cavalry Regiment. During the Vietnam War, the post served as the Engineer Officer Candidate School training. Most recently, during the Iraq war, Fort A.P. Hill has served as training grounds for hundreds of units throughout the Armed Forces preparing for deployment (K. Perrotte, 2006).

Current Mission

Fort A.P. Hill serves every component of the U.S. Armed Forces, both active and reserve as well as other government agencies, including the Bureau of Alcohol, Tobacco, Firearms and Explosives. Foreign military allies also utilize Fort A.P. Hill, including Canada, the United Kingdom and Germany. Annually, Fort A.P. Hill averages approximately 500,000 man-days of training, representing more than 70,000 individual military members (Fort A.P. Hill, 2005).

The primary mission of the installation is to provide firing ranges and maneuver areas for training. The mission states, “Fort A.P. Hill provides realistic joint and combined arms training, logistics and support, enabling America’s Defense Forces to win in 21st Century battle space” (Fort A.P. Hill, 2006).
To complete this mission, the installation has a myriad of training facilities. There is a 28,000 acre, live fire range complex featuring more than 100 direct and indirect fire ranges, with no environmental restrictions. This is primarily for small arms, direct fire weapons, anti-tank missiles, artillery and aerial gunnery. In addition, there are tactical landing zones, parking areas and refueling facilities for rotary wing aircraft. There is an airfield which is primarily used by rotary wing aircraft. A few times a year, C-130 aircraft (and soon C-17 aircraft as well) utilize the assault airstrip in the installation’s drop zone (Fort A.P. Hill, 2005).

Additional facilities in use on the installation include a Nuclear Biological and Chemical Chamber, which is used in conjunction with the Decontamination Site. A Hostage Rescue Site is onsite and is also used by local law enforcement agencies. An Enemy Prisoner of War Compound, a Rail Loading Site as well as a Combat Village are available on Fort A.P. Hill.

New facilities have also been developed for use in modern and changing warfare. The range program at Fort A.P. Hill is structured to support future force structures. Currently completed is a live-fire convoy range, which is modeled after the Udari Range in Kuwait. This range teaches leaders to react to ambushes. A larger convoy range is being developed, with help from the U.S. Army Transportation School at Fort Eustis. Additionally, under construction is a 37 kilometer maneuver corridor with objectives at several stages, including the capability to conclude with a combined arms live-fire exercise. This is being completed in preparation for training the 56th Stryker Brigade of the Pennsylvania National Guard as well as other units using wheeled combat vehicles (Fort A.P. Hill, 2005).

The Assault Landing Field has been refurbished and is now certified to handle up to C-17 aircraft. The Assault Landing Field lays in close proximity to a new facility – the Combined Arms Collective Training Facility (CACTF). This facility includes a shoothouse, breach facility and an urban assault course. This represents a total of $10.8 million in MCA projects under construction in fiscal year 2006. There are two planned enhancements to this facility in 2007 and 2008, which will bring this to a $26 million dollar urban training complex (Fort A.P. Hill, 2005).

In addition to training facilities, Fort A.P. Hill is home to other tenants of the Armed Services. The Army’s Night Vision and Electronic Sensors Directorate’s primary testing facilities are located within Fort A.P. Hill. They test night vision and other imaging systems as well as operate one of the most active landmine research centers in the Nation. Elements of the 29th Infantry Division are located here as is the Asymmetric
Fort A.P. Hill and the Surrounding Localities

A Joint Land Use Plan and Process

Warfare Group’s Training and Validation Center. Plans are underway for Fort A.P. Hill to become a Center of Excellence for Combat Support Warrior Training, in partnership with Fort Lee, Virginia.

Internal Landuse

The land use inside the installation is split into two categories: open operational uses and built-up cantonment areas. The majority of land is used for operational uses, about 95%, with the remaining 5% devoted to the cantonment areas. This 5 %, or roughly 3,500 acres, contains the administrative and service support functions as well as the residential areas. The U.S. Army Garrison Area includes the Post Headquarters and staff offices including Provost Marshall’s office, POL facility, conference facility, physical fitness center, and transient lodging facilities (Department of the Army, Real Property, 2004).

The open operational uses are broken down into ranges and impact areas, field training areas, an Assault Landing Zone, an Ammunition Supply Point, a drop zone, a research and development area and several closed sanitary landfill sites (Department of the Army, Real Property, 2004). Field training areas are the largest segment of this land, occupying 55,000 acres with 31 separate training areas. Most of these training areas are located on the Northwest side of Rt. 301. Training activities involve the use of blank ammunition, artillery simulators, flares and pyrotechnics, tear gas, chemical smoke, limited demolitions, tactical convoys, manned aircraft and unmanned aerial vehicles.

The ranges currently include 40 direct fire and 50 indirect fire ranges, which are capable of accommodating a variety of weapons fire. The ranges are arranged so they fire into impact areas, which result in a complex that provides tactical range facilities, explosives training and testing, indirect fire points, helicopter gunship firing areas and demolition sites.

Other land uses include the Fort A.P. Hill Airfield, which is located on the southeast side of Rt. 301, across from the Main Gate. This is used for rotary aircraft. Also located in the installation is an Assault Landing Zone in the drop zone, which can accommodate C-130, C-17 and rotary aircraft. There are several helicopter landing areas in strategic locations around the installation, all of which are used for training.

Campsites are also present around Fort A.P. Hill, with four permanent, year-round sites and seven temporary tent campsites mainly available May to September. Other residential uses include an on-post family housing and a separate trailer park for a total of 35 units (Department of the Army, Real Property, 2004).
Also designated within Fort A.P. Hill are unique environmental lands. There are five management units based on vegetation for natural resources management purposes: forests, brush/seedlings/saplings, grasslands, agricultural lands and wetlands (Department of the Army, Real Property, 2004). There are also 15 conservation sites worthy of protection and managements measures based on a Virginia Division of Natural Heritage survey and recommendations.

**Future Mission**

The future mission, in general terms, is to maximize the installation's capability to provide training opportunities to the Active and Reserve Army. There is a need, within the Department of Defense and the Department of the Army, for Fort A.P. Hill to grow in a training capacity. This need requires an increase in the number of troops and other military personnel that can, at any given time, be prepared for combat and mobilized in time of national emergency (Department of the Army, 2004). This will sharpen the nation's readiness. Ideally, troops need to train in the most realistic war time situations to maintain the highest degree of operation readiness.

Fort A.P. Hill is focused on providing the best possible training scenarios/grounds for the troops that utilize their facilities. Future plans call for expansion, mainly to replace aging, existing structure and to relocate certain facilities to more strategic locations around the grounds of the installation.

Finally, the Base Realignment and Closure Process of 2005 had an effect on Fort A.P. Hill’s future mission, as it did with nearly every military installation in the country. A quote on Fort A.P. Hill’s future mission, from the Public Affairs Officer, Mr. Ken Perrotte, states: “Fort A.P. Hill's stature as a regional training center was enhanced following the extensive realigning of missions at installations in the Mid-Atlantic as part of the 2005 Base Realignment and Closure Commission process. Numerous range and training facility modernization projects, representing a large Department of the Army investment in the installation, are under way with a robust plan outlining projects through the next decade. Substantial increases in small arms, artillery, demolition, wheeled combat vehicle and military aviation training are forecast. Fort A.P. Hill's military training workload is expected to more than double over the next few years with the annual number of warriors training on the installation potentially reaching 150,000, representing nearly one million mandays of training. The number of personnel - military, civilian, and contractors - working on the installation in support of these training activities is similarly expected to double."
Economic Impact

The study region is home to three military facilities, each having a distinctive economic impact on the area. Naval Surface Warfare Center of Dahlgren and Marine Corps Base Quantico employ a greater number of people than Fort A.P. Hill. A comparison of employment in 2001 shows MCB Quantico with over 14,000 employees, Dahlgren with over 4,500 employees and Fort A.P. Hill with less than 350 (Fredericksburg Regional Chamber of Commerce, 2003). Local military spending in the Fredericksburg region was also analyzed in 2001, showing Dahlgren with over $200 million in base spending, Quantico with $17 million and Fort A.P. Hill at over $15 million (Fredericksburg Regional Chamber of Commerce, 2003).

Fort A.P. Hill has a workforce of 390 government civilians (Fort A.P. Hill, 2006). It is the second largest employer in the County, behind the County School Board (VEC, 2006). The Army Stationing Installation Plan for July 2004 calculates a total installation population, including soldiers, civilian and contractors associated with tenant organizations of 1,477 personnel (Fort A.P. Hill, 2005).

An important contribution to the economic impact that Fort A.P. Hill has on the Region is the National Boy Scout Jamboree. The Jamboree is held every four years, and was held for the 7th consecutive time in July 2005. This event attracted over 42,000 Boy Scouts and adult Scout leaders, who reside on the base for 10 days. Visitors to this event number approximately 100,000. The Boys Scouts spent nearly $17 million on their 2005 jamboree in Virginia. In addition, an estimated $800,000 was spent in Caroline County on food and lodging that came from jamboree visitors (Free Lance Star, April 2006).
TECHNICAL DATA – STUDY AREA

Three Mile Study Area

Currently, there are approximately three miles of land surrounding Fort A.P. Hill that is of the greatest interest to the installation. This land holds great importance to the installation as this segment of land is impacted by a majority of their noise and safety operations. Fort A.P. Hill is aware of development within the region, but pays particularly close attention to development within this distance. For this project it is this three mile segment of land, shown in Map 2, that will be used to collect, analyze and interpret specific technical data. This process will help to determine a new land use plan within this segment of land. Important elements to review include: current and future land use, infrastructure improvements and environmental, historical and cultural resources. These elements help to demonstrate the location and nature of current growth as well as the growth and expansion that is anticipated.
Map 2: Three Mile Study Area
The three mile study area includes land in five counties: Caroline, King George, Essex, Stafford and Spotsylvania Counties as well as the two incorporated towns of Bowling Green and Port Royal. Bowling Green and Port Royal lie entirely within the study area. Nearly 8,000 people live within the three mile study area (U.S. Census Bureau, 2001).

The three mile study area contains over 100,000 acres. Table 3 illustrates that less than five percent of the total acreage is located in Spotsylvania County. Stafford County has the smallest amount of land in the study area, less than one percent. The majority of the three mile study area is made up of Caroline County, followed by Essex and King George Counties.

<table>
<thead>
<tr>
<th>Locality</th>
<th>Acres</th>
<th>Percent of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caroline County*</td>
<td>72,389</td>
<td>67%</td>
</tr>
<tr>
<td>King George County</td>
<td>10,790</td>
<td>10%</td>
</tr>
<tr>
<td>Essex County</td>
<td>18,550</td>
<td>17%</td>
</tr>
<tr>
<td>Spotsylvania County</td>
<td>5,018</td>
<td>5%</td>
</tr>
<tr>
<td>Stafford County</td>
<td>1,011</td>
<td>1%</td>
</tr>
<tr>
<td>Total</td>
<td>107,758</td>
<td>100%</td>
</tr>
</tbody>
</table>

*Includes the towns of Bowling Green and Port Royal

Source: GIS Data, Worldview Solutions, 2006

Current Land Use

Current land use can be defined in many ways, designated within a comprehensive plan or by an existing land use map. Zoning is often used by a locality to represent their current uses. For the seven localities within the three mile study area, a combination of these methods was used. Map 3 details the available information on current land use within the study area.
Map 3: Existing Land Use and Zoning - Three Mile Study Area

Map created by Beth J. Payne, VCU, March 2006.
For Spotsylvania and Stafford Counties, zoning information was used to define existing land use. These two localities contain the smallest acreage within the study area, so few land use designations are represented. In the far corner of Spotsylvania County, there is very little development. The uses are mainly rural residential, with no subdivisions to speak of. There are no commercial uses, but there is a concentration of industrial uses. As for Stafford County, the acreage that is within the three mile study area, about 1,000 acres, is agricultural land along the Rappahannock River, speckled with a few single family homes.

King George County’s current land use within the three mile study area was also defined by zoning. It is primarily agricultural land, with large lot single family homes along the Rappahannock River. There are a few scattered small scale commercial and industrial uses. There is a recently developed planned community, Hopyard Farm, which lies just outside the three mile area in King George County. This planned community will be a mix of retail and residential uses, including some public facilities. Construction is currently ongoing.

Besides Caroline County, Essex County has the most acreage located with the three mile study area around Fort A.P. Hill. Essex County, as a whole, is mainly rural, with 94% of the land in agricultural and forested uses (Essex County, 2003). Currently, most of the acreage in the study area is zoned and used as agricultural land. Large lot residential uses are scattered among the agricultural land.

Lastly, there is the acreage that lies within Caroline County and its incorporated towns of Port Royal and Bowling Green. Both Bowling Green and Port Royal are small towns, each with less than 1,000 residents. They have a true mix of uses, with a high concentration of residential uses, as each is laid out like a traditional town. Commercial uses are limited in Port Royal, but are plentiful in Bowling Green, as it serves as one of Caroline County’s commercial centers. Public uses, including government buildings and churches are found within these towns as well.

Current land use within Caroline County was determined by tax map and parcel records. With over 72,000 acres of Caroline County in the study area, a range of uses is present. A majority of the land is categorized as vacant, which generally can be interpreted as agricultural land. Low density residential uses also exist, as do mobile home parks. Industrial, commercial and public uses can also be found, though mostly concentrated around the Town of Bowling Green.
Future Land Use

Stafford County
As Stafford County contains less than one percent of the land within the three mile study area, potentially, their future land use will bear little future effect on Fort A.P. Hill. All of Stafford’s land within the study area is designated agricultural or lies within a designated Chesapeake Bay Resource Protection Area along the Rappahannock River.

Spotsylvania County
Spotsylvania County’s acreage (5,018 acres) falls into two of their development districts - the “Primary Settlement Area” and the “Rural Development District”. About 1,800 acres is within the Primary Settlement Area, leaving over 3,000 acres in the Rural Development District. In Spotsylvania County’s 2002 Comprehensive Plan, the Primary Settlement area is defined as: “This district is the area of the county where most of the county’s residential, commercial, office and industrial development has occurred over the past twenty-five (25) years and will continue to occur through the planning period. This plan reaffirms the concept of a primary settlement district, adequately served by public facilities, as the appropriate place for the highest use development of the land. This denser development allows for the most efficient provision of public services and, coupled with appropriate controls, will limit scattered, land consumptive development in other areas.”

The Rural Development District is defined:
“This district is presently made up of largely rural and large lot residential development. Some additional residential development would be allowed while maintaining the rural look and character of the land. Minimal public services would be provided. The rural character can be preserved by allowing concentrated development on a small portion of a site through cluster development.”

King George County
In King George County, the acreage (9,297 acres) falls mostly within the County’s Rappahannock River/South Rural Development Area. The County’s comprehensive plan describes this area as “…including the Rappahannock River shoreline and most of the County’s prime agricultural land. The Area is very rural in nature containing only 9.5 percent of the County’s population and approximately 740 housing units. ...The primary development objective for this Area is to encourage the continued rural nature of the Area” (King George County, 2005).

A fraction of the three mile study area’s acreage (1,157 acres) is in the Route 3 West Primary Settlement Area of King George County. This settlement area of the county is to
serve as the hub for its industrial development. Currently located there is the Power Facility, the County Landfill, the Village Farms Greenhouse and the County’s 123-acre Industrial Park. Future plans for this area are to encourage the development of compatible light and heavy industrial uses and to limit any residential development.

**Essex County**

All of the acreage (18,550 acres) in Essex County that is within the study area is designated as Agricultural Preservation for future land use. It encourages and preserves the agricultural uses currently found here and seeks to substantially limit residential development.

**Caroline County**

Caroline County utilizes subarea planning within their comprehensive plan. Subarea plans are a component of the comprehensive plan but more specifically, they articulate a vision and directives for each subarea. There are eight designated growth subareas, split between primary growth areas and secondary growth areas. There are three primary growth areas (Bowling Green/Milford, Ladysmith and Carmel Church) which make up the overall Primary Growth Boundary in the County. The comprehensive plan details that “The Primary Growth Boundary contains approximately eighty square miles of land area that equals approximately 15% of the County's land area” (Caroline County, 2001). This area lies in the central portion of the County, abutting Fort A.P. Hill along a segment of its southern boundary near Bowling Green. It is the area of the county where public utilities currently exist or are planned to be extended in the next 5-10 years. Some lands within Primary Growth Boundary are identified as ‘Future Development’. This label recognizes areas of the County where public utilities are not planned for extension in the ten year planning horizon. Yet, development is expected in these areas at some point in the county’s development.

Within the three mile study area, there are three designated future growth areas: Bowling Green/Milford primary growth area, which is part of the overall Primary Growth Boundary and the secondary growth areas of Port Royal and Skinker’s Neck. The Bowling Green/Milford primary growth area contains a major concentration of commercial uses, including two strip malls. Commercial and industrial development is encouraged to locate within this area.

The Port Royal secondary growth area is made up of and encourages highway commercial and low to medium density residential. Skinker’s Neck secondary growth area is the site of the yet-to-be-built Haymount planned community. The comprehensive plan defines, “Secondary growth areas are designed around existing pockets or
concentrations of residential and/or commercial development that are appropriate for small-scale or infill development” (Caroline County, 2001).

Besides the sub areas mentioned, the remaining land within Caroline County is a combination of agricultural preservation, rural preservation and floodplains. Table 4 breaks down the acreage of Caroline County within the three mile study area by land use designation.

Table 4: Caroline County Future Land Use Breakdown within Three Mile Study Area

<table>
<thead>
<tr>
<th>Designation/Type</th>
<th>Acres</th>
<th>Percent of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Growth Boundary*</td>
<td>7,608</td>
<td>10%</td>
</tr>
<tr>
<td>Secondary Growth Areas**</td>
<td>4,910</td>
<td>7%</td>
</tr>
<tr>
<td>Agricultural Preservation</td>
<td>50,006</td>
<td>69%</td>
</tr>
<tr>
<td>Rural Preservation</td>
<td>9,865</td>
<td>14%</td>
</tr>
<tr>
<td>Total</td>
<td>72,389</td>
<td>100%</td>
</tr>
</tbody>
</table>

* Includes the Bowling Green/Milford Primary Growth Area
** Includes Port Royal and Skinker’s Neck Secondary Growth Areas

The agricultural preservation designation promotes working agricultural uses, to contribute to the County’s economy. It is stated in the comprehensive plan that “Residential densities should be very low, generally not exceeding one dwelling unit per 25 acres of land. Land use regulations should protect and give preference to agricultural/forestry uses over other uses” (Caroline County, 2001). The rural preservation designation provides for low residential densities, not exceeding one unit per 10 acres of land. This land use designation is to reflect the rural character of the county. Map 4 illustrates the future land use in Caroline County as well as the rest of the study area. The map will better demonstrate the breakdown of designations.

The Town of Bowling Green
The Town of Bowling Green falls entirely within the three mile study area. The town has a high density pattern of development, with little remaining developable land. The land that lies along the Rt. 301 corridor, adjacent to Fort A.P. Hill has been designated to contain the Town’s future development. It was annexed in 1998. Currently, it is zoned
and designated for residential and commercial uses (Town of Bowling Green, 1998). Map 1 in Appendix A provides the Town of Bowling Green’s future land use.

*The Town of Port Royal*

The Town of Port Royal, like the Town of Bowling Green, is entirely within the three mile study area. The town has a high density pattern of development, continuing the same pattern of development since its founding in 1744 (Town of Port Royal, 1988). Designated future land use of the town carries out the same pattern of use as the existing uses. Route 301 is designated to contain all commercial uses. Besides the town’s public uses, the remainder of the Town is designated for low density residential uses.
Map 4: Generalized Future Land Use - Three Mile Study Area

Map created by Beth J. Payne, VCU, March 2006
Infrastructure Improvements – Roads/Utilities

Infrastructure improvements are needed to accommodate a growing locality. As roads and utilities are improved and expanded, growth has a propensity to follow them. Previously unusable land becomes feasible to build on. In addition, infrastructure can also be utilized to limit growth and development in specific areas of a locality. It is necessary to review scheduled improvements as a measure for potential future growth.

Stafford County
Stafford County has no scheduled road improvement projects within the three mile study area. Currently there are no public water or sewer utilities within this portion of Stafford County. As the land is designated Agricultural, utility expansion is very strongly discourage (Stafford County, 2003).

Spotsylvania County
Spotsylvania County just recently passed a bond referendum in 2005, which allows for money to be utilized for transportation improvements (K. Maloney, 2006). This includes the building of a Virginia Railway Express station, projected to be located in Spotsylvania County within or in extremely close proximity to the designated three mile study area. The exact location has not yet been determined. Road projects anticipated within the study area include several secondary road improvements.

Both water and sewer lines serve the section of Spotsylvania County that is within the study area. Land within the study area is designated as Primary Settlement as well as Rural Preservation, however extensions of utilities, both water and sewer, are encouraged in the Primary Settlement Area only.

King George County
According to the Draft 2005 King George Comprehensive Plan, there is a desire to upgrade Route 3 West to a rural parkway (four lanes, limited access roadway with substantial landscaping, a minimum number of grade-separated interchanges and no commercial development at the interchanges) from the Courthouse area to the Stafford Line. This is a major road improvement for the County, though only two miles of Route 3 runs through the study area and would generate few effects for Fort A.P. Hill. However, there is no definite schedule for this improvement (VDOT, 2005).

Most of the land within the study area in King George County is within the Rural Development area, where utility expansion is discouraged. However, the 1,000 acres that lies within the Route 3 West Primary Settlement Area is served by existing utilities.
Essex County
Essex County has no scheduled road improvement projects within the study area. At this time public water and sewer utilities do not exist within the three mile study area. The land is designated as Agricultural Preservation and utility expansion is very strongly discouraged.

Caroline County
In Caroline County, there are very few transportation improvements scheduled. There is a need mentioned within the 2001 Comprehensive Plan to widen Route 17 to four lanes from two lanes. While Route 17 does run through the three mile study area, there is no schedule for that project (VDOT, 2005). Utilities (water and sewer) will be expanded in phases within the Primary Growth Boundary only, specifically within the Bowling Green/Milford Primary Growth Area.

The Town of Bowling Green
There are no scheduled road improvements for the Town of Bowling Green (VDOT, 2005). The Town of Bowling Green, in their 1998 Comprehensive Plan, documented the desire to extend the water and sewer lines into the annexed portion of the Town located along the Route 301 corridor.

The Town of Port Royal
There are no scheduled road improvements for the Town of Port Royal (VDOT, 2005). Currently, the Town operates a water system which utilizes a well with a pump. It serves the Town’s residents, but has been found to be inadequate (Town of Port Royal, 1988). When funding can be securing, the water system needs to be upgraded. Also, there is no publicly owned sewer system in the Town; on site sewage disposal systems are used. Currently, there are no plans for a public sewage system.

Historic and Cultural Resources
Due to the historic nature of the study region as a whole, the lands within the three mile study area contain a variety of historic and cultural sites. In Caroline County, there are 12 registered historic sites as well as two Historic Districts – the towns of Bowling Green and Port Royal (Caroline County, 2001). The land in King George County that is within the study area is home to nine historic sites, with an additional four located a short distance away (King George County, 2005). In Essex County there are only two designated historic sites in the study area – Vauter’s Church and Elmwood (Essex County, 2003).
Environmental Resources

The Rappahannock River runs throughout the entire study area resulting in various wetlands, Chesapeake Bay Preservation areas and floodplains along the River. In Caroline County alone there are over 38,000 acres of floodplains within the three mile study area. Caroline County has also designated a Resource Sensitive Area in the northern portion of the County. It is bounded by the Rappahannock River to the North and Rt. 17 to the South (Caroline County, 2001). It bears this designation due to the concentration of environmental, historical and cultural resources located within its boundaries. Any development in this area has strict guidelines, encouraging the use of planned unit developments in order to cluster uses and preserve large amounts of open space.

There are also a variety of protected lands within the study area, as shown in Map 2 in Appendix A. Conservation easements are both publicly and privately held along the Rappahannock River. Other protected lands include nature preserves, wildlife management areas and wildlife refuges.
THE PLANNING PROCESS

Current Relationships

The current planning process that exists between Fort A.P. Hill and its surrounding localities is an important part in the assessment of the existing conditions in the study area. The current process is an indication of the relationship between the Post and each locality. An evaluation of this relationship reveals a foundation to expand and improve on and in many cases, to start a new relationship.

The current planning process between the installation and the localities within Fort A.P. Hill’s three mile study area varies by locality. In some, there barely exists a formal process at all. Currently, as this document is written, relations are improving. Controversial developments, attention from the media and the 2005 BRAC process have initiated more contact between Fort A.P. Hill and some localities. The Post is providing more detailed technical data and general information to the localities, in hopes of a greater level of planning cooperation. Also, it is important to mention that all localities within the three mile study area, including the Town of Bowling Green are undergoing comprehensive plan updates. This presents an opportunity for the localities to begin coordinating with Fort A.P. Hill. A positive first step would be to integrate this newly received technical data in to their comprehensive plans, which ultimately, would support more informed land use decisions.

Caroline County

Since Fort A.P. Hill resides in this locality, they have the strongest relationship. Legally, Virginia House Bill No. 714 mandates that localities, such as Caroline County, where military installations are located, provide notice of all rezonings within 3000 feet of the Post. The Post Commander has 30 days to provide comments and recommendations to the planning commission regarding the suitability of the zoning proposal in view of its proximity to the Post. In addition to this, a representative from A.P. Hill sits on the county’s technical review board, which provides the post with access to all proposed developments and rezoning applications and the ability to comment on them. They make appearances at planning commission and Board of Supervisors meetings. There is one annual meeting, hosted by Fort A.P. Hill, in which elected officials and members of the staff attend. It serves a networking function instead of a work session. Additionally, there is an Installation Community Council which meets infrequently throughout the year. There is one representative from Caroline County that sits on this council. Unfortunately, there is still no coordination in regards to comprehensive planning.
**Stafford County**
Currently, Stafford County has no relationship with Fort A.P. Hill, nor is there a dialogue about the potential of one (J. Harvey, 2006). This is not much of a surprise, due to the small presence Stafford County has within the three mile study area. But, Stafford County is one of the fastest growing localities in the State and the Region and has the potential for large scale developments.

**Spotsylvania County**
Since the New Post debacle (detailed in page 38, below) in the summer of 2005, the County and Fort A.P. Hill have had sporadic contact. In January of 2006, Fort A.P. discussed their applicable operational impacts with members of Spotsylvania County’s planning staff (R. Goss, 2006). It is anticipated that Fort A.P. Hill will provide more data to the County in the coming months to aid in the County’s comprehensive plan update. For the first time sector plans are being incorporated into the Plan. Specific sector plans will address applicable operational impacts and their constraints. In April 2006, a resolution was unanimously approved by the Spotsylvania County Board of Supervisors voicing support for the “vital mission” of Fort A.P. Hill in Caroline County. The nonbinding resolution vows that supervisors will work to limit encroachment around the military installation (Free Lance Star, April 15, 2006).

**King George County**
Currently, King George County has no relationship with Fort A.P. Hill, nor is there a dialogue about the potential of one (J. Green, 2006) It is the Rappahannock River that separates Caroline County and Fort A.P. Hill from King George County. This feature, unfortunately, is seen as a barrier for which impacts do not cross.

**Essex County**
Essex County is experiencing the least amount of growth and development in the study region. Currently, there are open lines of communication between Fort A.P. Hill and Essex County. The Post provides Essex with information regarding the operations on Post. It is beneficial that the portion of Essex within the study area is rural in nature and is planned and zoned to stay that way (L. Lumpkin, 2006). There has been no discussion of integrating the Post or its contours into their comprehensive plan in any form.

**Town of Bowling Green**
Like Caroline County, the Town of Bowling Green is bound by the Code of Virginia to provide Fort A.P. Hill with rezonings within 3000 feet of the Post. This affects a slight portion of the Town, along the Route 301 Corridor. The affected area happens to be a portion of the Town that was annexed in 1998 and is designated and zoned for commercial, office and residential development.
With the hiring of a new Town Manager, cooperation between the Town and Fort A.P. Hill is underway. The Town now provides agendas for all planning commission meetings and has initiated Fort A.P. Hill’s thoughts on the development of the adjacent annexed area and the Route 301 corridor (S. Manster, 2006). The establishment of a formal planning process is also being discussed.

**Town of Port Royal**
With the small town nature of Port Royal, there rarely is any new development within the Town limits. Their informal planning process does not include Fort A.P. Hill, except for the seat they hold on the Installation Community Council. This lack of a formal process is most likely due to their lack of current and perceived future development. Though, the Town is bound by the Code of Virginia to provide A.P. Hill with any rezoning applications, as a portion of the Town is within 3000 feet of the Post.

**Significant Re-zonings of the Past**
These past experiences in the rezoning process shed light on the effectiveness of the interactions between Fort A.P. Hill and its neighboring jurisdictions. The past rezonings reveal the planning process at work including its successes and failures. By examining Fort A.P. Hill’s role in each project, the process can be evaluated and ultimately, improved.

The two of the most significant re-zoning projects in proximity to Fort A.P. Hill occurred in 1989 and 2005. Map 3 in Appendix A illustrates each project location. Both projects exhibited striking similarities with a few key differences that uniquely defined each community. Each project had a distinct planning process and faced different outcomes. Fort A.P. Hill’s role varied in each.

**The Town of New Post**
Over the course of the last 15 years, there have been few large projects contemplated within the three mile study area around Fort A.P. Hill. Most have been similar in nature, planned communities that would integrate both residential and commercial uses. The largest and most controversial development of that nature was the Town of New Post, initially proposed in 2003. The Town of New Post was planned for the New Post area of Spotsylvania, within two miles of Fort A.P. Hill. The project encompassed 417 acres, with over 1,500 homes. The development was poised to be the first Traditional Neighborhood Development in the County and incorporated all 10 nationally recognized ‘smart growth’ principles.
Within New Post would be a town center, which would serve as the commercial core of the development with cafes, boutiques, offices, convenience centers and many other shops—all within walking or biking distance of the residents. The town center would also include “live-work” units — residences located above street-level shops. Also included in the plan would be biking/jogging trails, a community clubhouse, pool, and a 30-acre riverfront park.

Most widely discussed was the enormous proffer package that the development company, Tricord, offered to Spotsylvania County, with over $52 million in cash and infrastructure improvements. Included in that package was almost $20 million in transportation improvements, over $20 million for schools, $6 million towards Spotsylvania's Purchase of Development Rights program as well as $1 million towards an affordable housing trust. This was above and beyond the $28 million desired by the county (Tricord, 2005).

This development was a hot topic around the region for many reasons. Mainly, it centered on the transportation proffer package offered, which would begin to alleviate some of the County’s worst traffic congestion. Included in the transportation proffers that were pledged was $6 million to build a commuter rail station in the County, something that has been highly desired by many county residents.

Secondly, New Post exhibited a new pattern of development for Spotsylvania County, which has been plagued with ‘by-right’ development and sprawling growth. New Post was seeking to provide a new model of development to the County. Next, affordable housing and schools are always a cause of concern when a new development, especially a large one such as New Post, is proposed. New Post quelled the uneasiness by providing money for schools as well as money towards an affordable housing trust. The money in the trust would go towards interest free loans for Spotsylvania County employees – teachers, firefighters, police officers and county workers. Also, ten percent of the homes built would be reserved as affordable housing units (Tricord, 2005).

The last issue troubling the proposed development of New Post was Fort A.P. Hill. The Commander of Fort A.P. Hill denied support of the development, with its location so close to the installation’s borders. Numerous issues were raised by Lt. Colonel James M. Mis in several letters to County Supervisors addressing New Post. Prior to Lt. Colonel Mis’s letters in 2005, an initial letter of opposition was sent by the commanding Lt. Colonel at the time, at the inception of the proposed development in 2003. Additional letters were sent later in the process, detailing specific concerns. The Lt. Colonel was concerned with impacts generated by the development, including noise, excess light,
and degradation of the habitat that the land currently provides. An increase in population so close to Fort A.P. Hill would also generate more complaints about the activities of the installation and possibly hinder Fort A.P. Hill’s future expansion plans. The combination of these issues could have a detrimental effect on the installation (B. Sherman, 2006).

The discord and media attention garnered by Fort A.P. Hill and the proposed Town of New Post went on for several months between the summer and fall of 2005. The perception of Fort A.P. Hill’s involvement was that it was a last hour intervention, that their meetings and letters addressing Spotsylvania County to express their discontent were poorly timed. Over the two year planning horizon of this project, there were few meetings between Fort A.P. Hill and Spotsylvania County. Though, as the public hearings and final Board of Supervisors meeting drew near, the media attention grew. There were articles in the local paper, including editorials by both the Post commander as well as Tricord (Figure 5 in Appendix C provides an example). It seems the overall land use compatibility issue was played out in the media rather than in a discussion of viable alternatives by the decision-makers.

Finally, in an attempt to disprove A.P. Hill’s position, the Spectrum Group, a private consulting firm made up of retired military leaders, was hired by the developer to assess New Post in relation to the encroachment concerns expressed by Fort A.P. Hill. The firm’s report concluded that “the proposed New Post community not only meets, but far exceeds, the Army’s established Compatible Use Buffer program” (Tricord, 2005). This report justified the Town of New Post in the face of Fort A.P. Hill. Though, Fort A.P. Hill strongly disagreed with conclusion drawn by the Spectrum Group and had supporting documentation from current DoD officials to support their position (K. Perrotte, 2006). But ultimately, the battle was over, with the Spotsylvania Board of Supervisors denying the rezoning request for the Town of New Post on October 11th, 2005.

In retrospect, the biggest mistake made in this planning process was not involving Fort A.P. Hill in the very beginning. If they had the chance for an initial review of the rezoning application, the seemingly last minute intervention would have never happened. The Post would have had the opportunity to comment from the beginning, with a greater likelihood of compromise with the County and the developer.

**Haymount**

Haymount, a development proposed in northern Caroline County, is very similar to New Post. It was designed by Andres Duany, the leader in New Urbanism town planning. Haymount, like New Post, has a traditional neighborhood design, with a mix of
commercial and residential uses and a higher density to promote the walkability of the community. Haymount stands on over 1,700 acres in northern Caroline County, projected to support over 12,000 residents in 4,000 residential units. It is projected that there will be 500,000 square feet of commercial office space and 250,000 square feet of retail space. Schools, public facilities, places of worship, as well as parks and playgrounds have been integrated into the design of the development. Residential units would vary, from apartments and town homes, to one bedroom cottages and large single family homes. Prices would range from the mid $100,000’s to well over $500,000. The uses would be clustered on just over one third of Haymount’s acreage, leaving 1,000 acres in its natural state (John A. Clark Company, NA).

Haymount is distinctive due to its deference to sustainability and the preservation and conservation of the habitat surrounding it. Haymount will utilize innovative ecological techniques on-site, such as manmade wetlands to cleanse stormwater and wastewater. It would utilize ‘eco’ building materials such as permeable pavement and sustainably harvested lumber. Private programs would be managed for the protection of the bald eagle habitat close by, the wetlands and woodlands. But, its location mandates these things, since it is located in the County’s designated Resource Sensitive Area as well as in close proximity to Pettigrew. Pettigrew is a 934 acre Wildlife Management Area located along Rt. 17 in Caroline County, adjacent to Haymount. It is owned by the Virginia Department of Game and Inland Fisheries (DGIF). Haymount approached the DGIF with an idea to allow them to develop a portion (30%) of Pettigrew while leaving the remaining under conservation easement or as perpetual open space. In exchange for this, the developer would purchase twice the amount of land for the State (Free Lance Star, 1996). Though, this concept would never be allowed due to the deed restrictions placed on Pettigrew by its former owners, Fort A.P. Hill.

While New Post and Haymount are both modeled after traditional neighborhood design and New Urbanist principles, differences do exist. One difference is their place in history. Haymount was planned and designed in the late 80’s (1989), proposed to the County in the early 90’s and approved by the Board of Supervisors in 1992. The project was delayed for a year due to lawsuits filed by nearby residents. Ultimately, the lawsuits were dismissed and ground breaking took place in 1996, after 8 years of planning and investments totaling over $8 million (M. Finchum, 2006). As it stands now, in 2006, not one building has been constructed.

Another difference in Haymount and New Post is Fort A.P. Hill’s involvement. Haymount was much larger in size than New Post and in much closer proximity to Fort A.P. Hill. But
their persistence and battle tactics in fighting off these developments were quite different. Fort A.P. Hill took a firm, public stance against New Post. It was well documented in the media. Haymount, on the other hand, was a much quieter debate. One letter was sent to Caroline County, expressing their concern over development so close to their borders. Though, the time lapse between the two projects speaks volumes. Over the last two years, military encroachment and the BRAC closures have been and continue to be in the public eye. In the times of Haymount, military encroachment was not yet an issue – the Region was still decidedly rural.

The final difference was the timing of Fort A.P. Hill’s involvement. With Haymount, Fort A.P. Hill was involved from the beginning, as it reviewed the application of rezoning and all the accompanying details. With New Post, Fort A.P Hill’s involvement came later in the process, after many details seemed to be set in stone.

CURRENT COMPATIBILITY TOOLS

Tools in Use by Fort A.P. Hill

There are variety of tools in use throughout the country to better equip both the military and localities in developing compatible land uses around a military installation. The military uses these tools to address their operational impacts on land outside of their borders. The localities employ tools to protect the quality of life of their residents while trying to properly develop land around the installation. Some tools are new and innovative and have been developed to utilizing the latest information technology. Other tools are time - tested, practical and adequately serve their purpose. In the case of Fort A.P. Hill and the study region, there are a few tools currently in use. An arsenal of tools is most effective in proactively dealing with the issue of encroachment.

Noise Management Program

Fort A.P. Hill was among the early adopters in using noise measurement technology to assess how noise travels past the boundaries of the installation. Noise contours were first calculated back in 1984, updated in 1997 and continually maintained after a series of key assessments and training modifications. Noise contours have been developed for a variety of weaponry, including small arms, artillery and large demolitions. Other noise contours address different types of aircraft utilized at the post. After reviewing the operational impacts on the surrounding community, Fort A.P. Hill made internal changes to better contain their operational impacts. This includes establishing a ‘friendly-fly’ zone
over the towns of Port Royal and Bowling Green, limiting fire when possible on Sunday mornings and late at night, and installing noise monitoring systems (US CHPPM, 2006). Increased public awareness and an increased effort to communicate with neighboring localities and specific citizens groups were undertaken to keep citizens informed on the events occurring on the post. All of these efforts have helped to decrease the frequency of noise complaints from neighbors and to develop a better relationship between the post and the general public.

Public Outreach
Beyond meeting with civic groups and governmental bodies, Fort A.P. Hill also worked with regional news media to help inform neighboring communities about the nature of Fort A.P. Hill’s military mission. Critical in this was fostering awareness that the installation is a field combat training center and not a military “office park.” It is the inherent nature of the work taking place within the installation to make noise (K. Perrotte, 2006).

Additionally, to ensure that the public was aware of the operations of Fort A.P. Hill, the installation designed billboards that portrayed a strong graphic image of military training, often with a .50 caliber machine gun or shoulder fired high explosive anti-armor weapon, and supporting text that read, ‘Where America’s Military Sharpens Its Combat Edge’ (US CHPPM, 2006). These were placed at four gates along major highways in proximity to Fort A.P. Hill. This allowed the installation to portray a visual representation to the public of their ongoing mission. Also, a visible water tower along U.S. 301 was also painted with a silhouette of a soldier firing a rifle.

Army Compatible Use Buffer Program
Congress recently acknowledged the serious threat that encroachment poses to the military’s readiness and their accomplishment of their mission of training America’s soldier. Authority was given under Title 10, United States Code, Section 2684a, “Agreements to Limit Encroachment and Other Constraints on Military Training, Testing, and Operations,” and was enacted by Congress as Section 2811 of the National Defense Authorization Act for fiscal year 2003. Specifically, this authority gives the Army the ability to partner with states, other governments as well as private or public environmental and conservation groups to achieve sustainability by managing sprawl and promoting compatible land uses.

The Army Compatible Use Buffer (ACUB) Program implements the authorities given to the Army by Congress to battle encroachment, allowing them to formalize the process of establishing compatible use buffers around their installations. Buffers are established...
around active ranges and training lands as a priority for protection. This program then allows the Army a new way to acquire land or interest in land from a willing private landowner without using the complicated land acquisition process administered under Army Regulation 405-10, “Acquisition of Real Property and Interests Therein”, which acquires new land for Army ownership (Engineer, 2004).

The approval process of an ACUB is multi-layered. It is initiated locally at the installation but is centrally approved and funded. The Assistant Chief of Staff for Installation Management (ACSIM) has the final approval authority, but first the ACUB proposals must be validated by the Installation Management Agency or major command. Once validated, the proposal is sent to the Office of the Director of Environmental Programs for a review before a final recommendation is sent to the ACSIM. Important to note is that approval of the ACUB program does not guarantee funding.

The Program partners are generally responsible for the success of the program. An approved ACUB program allows the installation to reach out to these partners to determine common objectives of land conservation and prevention of development to critical open areas. It is the partners that work with the willing landowners to acquire land. It is the partner, not the Army that receives the deeded interest in the property and provides for the long-term habitat management on the land. This acquired land now provides a natural buffer between the military training lands and residential or commercial activities.

Eligible partners in this program, as stated by the 10 USC §2684a, are state governments or private organizations with land and natural resource conservation as their mission. This includes land trust groups, state and federal agencies as well as the private sector. Examples of current partners around the country include: The Nature Conservancy, The Trust for Public Lands, The U.S. Fish and Wildlife Service, and The Conservation Fund.

Fort A.P. Hill was listed as a priority installation because of a critical training land shortfall or because it has the potential for significant expansion with a list of strategic training land reserves (Engineer, 2004). Currently, Fort A.P. Hill has an approved ACUB proposal, approved August 5th, 2005. Fort A.P. Hill’s ACUB partners will acquire conservation easements from willing landowners that will prohibit incompatible development in perpetuity, while keeping the land in private ownership and allowing for traditional land uses such as farming and forestry (U.S. Army Environmental Center, 2005). Their current partners include: The Nature Conservancy, Virginia Chapter; the
Virginia Outdoors Foundation; The Conservation Fund and The Trust for Public Land, Chesapeake and Central Appalachian Field Offices.

A central goal of Fort A.P. Hill and its partners are to secure the Rappahannock River Riparian Area (adjacent to U.S. Fish and Wildlife Service’s Rappahannock River Valley National Wildlife Refuge) as well as open farmland surrounding the installation. The majority of the funding is expected to come from the Office of The Secretary of Defense. Hopefully, as the projects gain public awareness and success funding through contributions will increase. As of Fiscal Year 2005, there was no funding from the Department of Defense or partners (U.S. Army Environmental Center, 2005). Currently, in the yet-to be approved FY2007 budget for the Commonwealth of Virginia, there is $3.2 million dollars earmarked for use by Fort A.P. Hill’s ACUB program to help fund the purchase of conservation easements around the Post (K. Perrotte, 2006).

Tools in Use by the Localities

To determine the tools available to localities that support compatible land uses around Fort A.P. Hill, it is easiest to review their local government policy. Localities that have been reviewed include those that have land within the three mile study area (Counties of Caroline, King George, Essex, Spotsylvania and Stafford and the Towns of Port Royal and Bowling Green). The review looked for the following things:

- **Plan Coordination** – Does the locality provide specific language in their comprehensive plan regarding land use coordination with Fort A.P. Hill? Is the issue of encroachment addressed in any form?

- **Development Review** – Does locality provide the Post with the chance to review and comment on site plans and rezoning applications?

- **Growth Management** – Does the locality have a policy or language in the plan devoted to guiding growth to specific portions of the County? To keep growth away from areas adjacent to the Post or that are directly affected by the Post’s operation impacts?

- **Conservation** – Does the locality have established programs/guidelines to preserve undeveloped or rural lands?

- **Flexible Land Use** – Does the locality allow flexible zoning, like planned unit development, which can utilize innovative site design to reduce impacts felt from the Post?
- **Noise Reduction** – Does the locality require specific construction techniques to mitigate noise for new residential construction within high noise areas?

- **Disclosure** – Does the locality require that real estate transactions, either existing home or new construction, disclose potential impacts from Fort A.P. Hill to prospective buyers? Is it written in the deed for new construction?

Some of the policies above are Fort A.P. Hill specific: disclosure, noise reduction, plan coordination and development review. These policies would directly aid in compatible land use with the Post. Other policies reviewed are more general in nature: growth management, conservation and flexible land use, but the principles of these tools could easily be applied to the compatible land use efforts around Fort A.P. Hill. If the tools currently exist, then there is a better chance that they could be utilized in the overall plan to encourage appropriate development around the Post. Below, Table 5 reviews potential land use compatibility tools in use within the study area.

### Table 5: Local Government Based Compatibility Tools

<table>
<thead>
<tr>
<th>CAROLINE COUNTY</th>
<th>Tool</th>
<th>Does it exist?</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plan Coordination</td>
<td>No</td>
<td>Mentions the existence of the Post, but no discussion of coordination</td>
<td></td>
</tr>
<tr>
<td>Development Review</td>
<td>Yes</td>
<td>Fort A.P. Hill is on the Technical Review Board</td>
<td></td>
</tr>
<tr>
<td>Growth Management</td>
<td>Yes</td>
<td>Primary Growth Boundary is designated</td>
<td></td>
</tr>
<tr>
<td>Conservation</td>
<td>Yes</td>
<td>Specific Land use designations for conservation, alternative programs encouraged</td>
<td></td>
</tr>
<tr>
<td>Flexible Zoning</td>
<td>Yes</td>
<td>Planned Unit Development</td>
<td></td>
</tr>
<tr>
<td>Noise Reduction</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Disclosure</td>
<td>Partially</td>
<td>Disclosure is not required or tied to a deed, but a notice is put on the site plan</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>KING GEORGE COUNTY</th>
<th>Tool</th>
<th>Does it exist?</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plan Coordination</td>
<td>No</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>Development Review</td>
<td>No</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>Growth Management</td>
<td>Yes</td>
<td>Urban Growth Planning Policy Areas are designated</td>
<td></td>
</tr>
<tr>
<td>Conservation</td>
<td>Yes</td>
<td>Rural Preservation Planning Policy Areas are designated</td>
<td></td>
</tr>
<tr>
<td>Flexible Zoning</td>
<td>No</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>Noise Reduction</td>
<td>No</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>Disclosure</td>
<td>No</td>
<td>None</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>ESSEX COUNTY</th>
<th>Tool</th>
<th>Does it exist?</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plan Coordination</td>
<td>No</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>Development Review</td>
<td>No</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>Growth Management</td>
<td>Yes</td>
<td>Development Service District defined</td>
<td></td>
</tr>
<tr>
<td>Conservation</td>
<td>Yes</td>
<td>Land Use designations for Agricultural Preservation</td>
<td></td>
</tr>
<tr>
<td>Flexible Zoning</td>
<td>Yes</td>
<td>Floating Zones - Planned Residential and Planned Unit Development</td>
<td></td>
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<tr>
<td>----------------</td>
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<td>---------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Noise Reduction</td>
<td>No</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>Disclosure</td>
<td>No</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td><strong>SPOTSYLVANIA COUNTY</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plan Coordination</td>
<td>No</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>Development Review</td>
<td>No</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>Growth Management</td>
<td>Yes</td>
<td>Current and future Primary Settlement Areas defined</td>
<td></td>
</tr>
<tr>
<td>Conservation</td>
<td>Yes</td>
<td>Land Use designations for Agricultural/Forestal Preservation, alternative programs encouraged</td>
<td></td>
</tr>
<tr>
<td>Flexible Zoning</td>
<td>Yes</td>
<td>Policies which “permit and encourage creative site design and clustering” and the preservation of open space in comprehensive plan and zoning ordinance. Planned Residential and Commercial Development Zoning Designations</td>
<td></td>
</tr>
<tr>
<td>Noise Reduction</td>
<td>No</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>Disclosure</td>
<td>No</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td><strong>STAFFORD COUNTY</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plan Coordination</td>
<td>No</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>Development Review</td>
<td>No</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>Growth Management</td>
<td>Yes</td>
<td>Urban Service Area defined</td>
<td></td>
</tr>
<tr>
<td>Conservation</td>
<td>Yes</td>
<td>Land Use designations for Agricultural lands, alternative programs encouraged</td>
<td></td>
</tr>
<tr>
<td>Flexible Zoning</td>
<td>Yes</td>
<td>Floating Zones – Planned Development</td>
<td></td>
</tr>
<tr>
<td>Noise Reduction</td>
<td>No</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>Disclosure</td>
<td>No</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td><strong>TOWN OF BOWLING GREEN</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plan Coordination</td>
<td>Yes</td>
<td>In process for the first time</td>
<td></td>
</tr>
<tr>
<td>Development Review</td>
<td>Yes</td>
<td>Yes, all rezoning cases sent to Fort AP Hill as well as agendas for Planning Commission Meetings</td>
<td></td>
</tr>
<tr>
<td>Growth Management</td>
<td>NA</td>
<td>The town, in its entirety, is an urban growth center</td>
<td></td>
</tr>
<tr>
<td>Conservation</td>
<td>Yes</td>
<td>Conservation land use designation</td>
<td></td>
</tr>
<tr>
<td>Flexible Zoning</td>
<td>Yes</td>
<td>Planned Unit Development</td>
<td></td>
</tr>
<tr>
<td>Noise Reduction</td>
<td>No</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>Disclosure</td>
<td>No</td>
<td>Under discussion</td>
<td></td>
</tr>
</tbody>
</table>
NOISE AND SAFETY CONSIDERATIONS

Noise at unacceptable levels is unsettling to people, as it can disrupt normal routines, break concentration and hinder the enjoyment of peace and quiet at home. In some instances it can have psychological effects – causing feelings of anger, irritation and annoyance. In extreme cases, it can also lead to hearing loss. Noise is objective, what bothers one person, may not affect another. The noise from operational impacts at Fort A.P. Hill may vary in annoyance among local residents. High noise levels resulting from operations on Post, like any high noise level, may cause stress, the disruption of sleep and concentration and decreased ability to communicate and learn. Levels of noise may also result in vibrations, rattling windows and shaking homes or businesses.

Fort A.P. Hill generates operational impacts that are typical of Army training installations with noise being the most common effect. Noise is generated not only by aircraft, but also by the variety of weaponry utilized on the post. Small arms fire, large weapons fire, demolitions and explosives contribute to the noise. Noise is also caused by rotary and fixed wing aircraft. Peak noise levels caused by these operations, both aircraft and weaponry, are often the main source for complaints by the general public. But, there is also a persistent low level of noise that often can contribute to a perceived decline in quality of life for people situated in affected areas.

The Department of Defense and therefore, Fort A.P. Hill utilizes a couple of widely accepted metric to measure environmental noise. One measure is the day night sound level (DNL). It describes the average daily acoustic energy over the period of one year, meaning that moments of quiet are averaged with moments of loud noises. It also incorporates a 10 dB penalty for nighttime noise (10 pm to 7 am), which is appropriate since noise during those times is often more annoying (US CHMMP, 2005). The DNL noise measurements are also weighted to determine what people actually hear (A-weighted) and what people actually feel from vibrations caused by lower-frequency noise (C-weighted). Figure 1 in Appendix B provides information on common sounds and their associated noise levels.

According to Fort A.P. Hill, the use of average noise levels over a protracted time period, however, generally does not adequately assess the probability of community noise complaints from military testing and training activities. The risk of community noise concerns or complaints from large caliber impulsive noise seen with armor, artillery, mortars and demolition activities, is best assessed in terms of a single event metric, either peak sound pressure level [PK 15 (met)] or c-weighted sound exposure level (CSEL). The metric Pk 15 (met) accounts for statistical variation in a single event peak.
noise level due to weather. It is the calculated peak noise level, without frequency weighting, that is expected to be exceeded by 15 percent of all events that might occur. If there are multiple weapon types fired from one location, or multiple firing locations, the single event level used should be the loudest level that occurs at each receiver location (K. Perrotte, 2006). This measure helps to assess maximum noise levels during a single event and helps to predict complaints.

There have been a variety of studies completed that analyze noise levels associated with military operations and the annoyance felt by people exposed to those noises. As Fort A.P. Hill generates noise from blasts and small arms fire and studies their impacts, it has utilized information from these operation-specific studies. Figures 2 and 3 in Appendix B detail the specific statistics. Noise from aircraft, both fixed wing and rotary is also experienced at Fort A.P. Hill. Fixed wing aircraft operations include jet and turboprop planes. Typically, there are less than 50 operations per day per flight corridor (Fort A.P. Hill, Aviation Fixed Wing, 2006). Table 6 details the maximum noise levels for U.S. Army fixed wing aircraft operated at Fort A.P. Hill, while Table 7 details the maximum noise levels for Rotary Wing aircraft operated at Fort A.P. Hill.

Table 6: Maximum Noise Levels of Fixed Wing Aircraft Operated at Fort A.P. Hill

<table>
<thead>
<tr>
<th>Altitude AGL (feet)</th>
<th>Maximum Level, dBA</th>
<th>C-12</th>
<th>C-17</th>
<th>C-130</th>
<th>F-14</th>
<th>F-16</th>
<th>F-18</th>
</tr>
</thead>
<tbody>
<tr>
<td>200</td>
<td></td>
<td>88</td>
<td>108</td>
<td>100</td>
<td>122</td>
<td>112</td>
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<td>79</td>
<td>98</td>
<td>92</td>
<td>113</td>
<td>103</td>
<td>116</td>
</tr>
<tr>
<td>1000</td>
<td></td>
<td>73</td>
<td>90</td>
<td>85</td>
<td>105</td>
<td>96</td>
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<td>80</td>
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<td>87</td>
<td>99</td>
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<tr>
<td>5000</td>
<td></td>
<td>57</td>
<td>66</td>
<td>66</td>
<td>82</td>
<td>74</td>
<td>85</td>
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<tr>
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<td></td>
<td>50</td>
<td>57</td>
<td>57</td>
<td>69</td>
<td>62</td>
<td>71</td>
</tr>
</tbody>
</table>

Source: Fort A.P. Hill, Aviation Fixed Wing 2006
Table 7: Maximum Noise Levels of Rotary Wing Aircraft Operated at Fort A.P. Hill

<table>
<thead>
<tr>
<th>Altitude AGL (feet)</th>
<th>Maximum Level, dBA</th>
<th>AH-1</th>
<th>AH-64</th>
<th>CH-47D</th>
<th>OH-58D</th>
<th>UH-1</th>
<th>UH-60</th>
</tr>
</thead>
<tbody>
<tr>
<td>200</td>
<td>93</td>
<td>94</td>
<td>98</td>
<td>90</td>
<td>91</td>
<td>91</td>
<td></td>
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<tr>
<td>500</td>
<td>85</td>
<td>86</td>
<td>89</td>
<td>81</td>
<td>83</td>
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<td></td>
</tr>
<tr>
<td>1000</td>
<td>79</td>
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<td>83</td>
<td>75</td>
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<tr>
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<td>52</td>
<td>59</td>
<td>48</td>
<td>52</td>
<td>48</td>
<td></td>
</tr>
</tbody>
</table>

Source: Fort A.P. Hill, Rotary Aircraft, 2006

By comparing the two tables above, which detail the maximum noise levels of fixed wing and rotary aircraft, with Table 8 below, it can be determined the percentage of people highly annoyed by the aircraft used on the installation. For instance, an F-18, flown at 10,000 feet will annoy five percent of the population, at 71 dBA.

Table 8: Percentage of Population Highly Annoyed from Aircraft Noise

<table>
<thead>
<tr>
<th>Maximum, dBA</th>
<th>Percentage Highly Annoyed</th>
</tr>
</thead>
<tbody>
<tr>
<td>70</td>
<td>5</td>
</tr>
<tr>
<td>75</td>
<td>13</td>
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<tr>
<td>80</td>
<td>20</td>
</tr>
<tr>
<td>85</td>
<td>28</td>
</tr>
<tr>
<td>90</td>
<td>35</td>
</tr>
</tbody>
</table>

Source: Rylander, 1974
The effects of noise are of great concern to all parties affected by it and considerable time has been devoted to scientific research on noise impacts. With this information, agencies have adopted guidelines for compatible land uses and environmental sound levels. As land uses are most often determined by local planning and zoning officials, it is critical that noise levels be considered in the decision making process. Noise levels that are appropriate for some land uses may be unacceptable for others. Noise levels in residential neighborhoods must be considerably lower than noise levels for agricultural or industrial land.

**Fort A.P. Hill’s Contours**

In many cases, the effects from Fort A.P. Hill’s military operations can be contained within their boundaries. Other times, noise and safety impacts will extend beyond their borders. There are a few instances where the effects will reach far outside their borders, well beyond even the three mile study area. For this reason, contours have been created that depict the range of area that will be affected by specific operations. These contours exist for particular weaponry events as well as specific types of aircraft and cover both noise and safety effects.

The noise and safety contours detailed below are developed by Fort A.P. Hill to study their impacts on the surrounding region. These contours should be utilized to make deliberate and informed decisions in regard to the development of the affected areas outside the Post’s boundaries. The effects produced within each of these contours imply that there are development constraints for these areas, due to noise levels and safety. Analysis of current and future landuse, infrastructure and resources in conjunction with the implications of these contours is needed to plan for compatible development. This is critical to continue Fort A.P. Hill’s mission and to sustain an adequate quality of life for the residents in the localities that surround the Post.
Noise Contours

_Weaponry_

Fort A.P. Hill has numerous noise contours. A few are associated with weaponry, including large demolition activities as well as artillery fire. Fort A.P. Hill notes that the use of high explosives and large caliber weapons are among the most common causes of concern and complaint among people living near the boundaries of the installation (Fort A.P. Hill, Mid Sized Explosives, 2006). The large demolition contour and the artillery noise contours are represented in Map 5. These contours represent the actual noise level for that specific type of weaponry.

The inner ring (130 contour line) of the artillery fire noise contour is the only contour that is fully contained within the Post’s borders and represents the loudest noise levels. They often exceed 130 decibels. The outer ring of artillery noise (115 contour line) represents a lower level of noise, around 115 decibels. This contour slightly exceeds the Post’s boundary and extends into the three mile study area. The inner ring of the demolition contour (130 contour line) represents the highest noise levels, which often exceed 130 decibels. The outer ring (115 contour line) extends outside of the installation’s boundary, and in many places, outside of the three mile study area.

These contours, with their loud noise levels, pose a high risk of annoyance to residents. There is a medium to high risk of complaint from the blasts and it is anticipated that well over 38% will be annoyed by the artillery noise (Fort A.P. Hill, Mid Sized Explosives, 2006). This precipitates that residential uses within and nearby these noise contours will be greatly affected. The quality of life of the residents will be diminished. This often leads to conflict between the military and the residents. It is recommended by the Post that residential uses not be within or adjacent to the contours. Agricultural and rural districts are the preferred and often most appropriate uses within these areas (Fort A.P. Hill, Mid Sized Explosives, 2006).
Special Area Noise Contours
Other noise contours originate from the development and use of specialized training areas on Post. The Combined Arms Collective Training Facility (CACTF) and the Maneuver Corridor that are in development will cause specific operational impacts, including noise. The Maneuver Corridor is a 37 kilometer corridor has a series of objectives designed to train personnel in Army Stryker combat vehicles and similar vehicles. This, along with the CACTF will produce a variety of noise levels, as the firing and weapons will not be directed at any fixed target. This causes the noise to be spread
in all directions of the firing. The most common causes of noise from these areas are from five pound C4 explosives as well as rifles and machine guns.

The contours, shown on Map 6, represent the peak noise levels for these operations. As the weapons used within these areas are not directed at any fixed target, the contours must be extended to account for all of the resulting noise levels. The levels range from over 113 decibels at 5000 meters away for C4 explosives to between 25-55 decibels for guns at 4000 meters away. With these types of noise levels, it is advised by the military that residential uses be located away from this area, due to persistent annoyance and irritation at noise levels. Agricultural and industrial uses would be more appropriate within and adjacent to these contours (Fort A.P. Hill, Combined Arms, 2006).

Map 6: Special Area Noise Contours – Fort A.P. Hill
Rotary Wing Noise Contours

Other noise contours provided by Fort A.P. Hill are related to the aircraft operations that take place on the Post. Rotary aircraft are utilized at the Post, including several types of helicopters. Some of these fire rockets and cannons with high explosive warheads. Helicopter use in operations is very common on Post, though there are less than 50 operations per day per flight corridor (Fort A.P. Hill, Rotary, 2006). It has been determined by Fort A.P. Hill that although the number of flights will not generate A-weighted noise levels, the complaints and annoyance of the general public will come from the aircraft’s entrance and exit of the airspace around the installation. Map 7 illustrates the rotary noise contour.

Map 7: Rotary Noise Contour – Fort A.P. Hill

Map created by Beth J. Payne, VCU, March 2006
Noise levels will vary based on the type and altitude of aircraft operated. Important to note is the size of the contour. It is customary to expand the noise contour around the flight path of the aircraft, in the case of rotary aircraft, ¾ of a mile (Fort A.P. Hill, Rotary, 2006). This is done to account for the variation in location of the aircraft and its overall noise impact and to supply an adequate buffer distance to account for noise levels.

The noise contour uniformly lies within the three mile study area and represents noise levels from 48-98 decibels, depending on altitude and aircraft. Based on Table 7 (page 50), there could be a significant level of annoyance by residents in the upper decibel levels. Residential uses may be compatible with the higher noise levels, under certain conditions. Disclosure of military operations and potential impacts should be made known to all residents within the contour. Newly built residential homes may incorporate sound and vibration reduction construction techniques.

**Fixed Wing Noise Contours**

Other aircraft utilized at Fort A.P. Hill are those of the fixed wing variety, including jet and turboprop aircraft. These aircraft are operated most often in two areas of the Post: the Assault Landing Zone and Bomb Run. Map 8, shown below, represents a variety of contours in respect to fixed wing aircraft operations. The noise contour in the southeastern portion of Fort A.P. Hill represents the noise contour for the fixed wing operations to and from Bomb Run. The Bomb Run approach is a flight path where aircraft will come in at varying altitudes and speeds, and then conduct air-to-ground combat missions where they fire live ordnance at ground targets, typically in a close air support role for ground forces. The aircraft transiting this area can vary from FA-18, F-16, A-10, AC-130 gun ships, and more. There is no "airstrip" there upon which aircraft can land, which results in a more general noise contour. The noise level varies across this contour based on the types of training exercises, the type of aircraft and its altitude. The contour for the fixed wing corridor, like the rotary wing, has been expanded to account for the variation in location during the aircraft’s flight. It is expanded between 1 and 1 ½ miles for fixed wing aircraft (Fort A.P. Hill, Aviation Fixed Wing, 2006).
The noise contours shown in the northwestern portion of Fort A.P. Hill represent fixed wing noise contours for the Assault Landing Zone. This contour is more specific than that of Bomb Run, because aircraft can and do land and take off from this area. This contour is split into two sections, representing different altitudes of the aircraft and therefore, different noise levels. The striped portion represents aircraft at 1,700 feet or less, while the hollow purple portion of the contour represents aircraft between 1,700 and 3,500 feet. The noise impacts vary with the altitude of the aircraft, with the aircraft creating a marked increase in noise the lower it flies.
The altitude of the aircraft and its resulting noise directly influences the types of land uses recommended within these contours. Within the outer contour that represents altitudes between 1700 and 3500 feet, there is less noise and less associated safety risks. A variety of land uses is deemed appropriate, with certain stipulations. Residential uses may be an effective use of the land, with steps taken to inform the residents of the noise or even to incorporate sound proofing techniques into construction. In the inner contour that represents altitudes of less than 1700 feet, there are fewer compatible uses. Residential uses are discouraged as are cultural and entertainment uses like churches, amphitheaters, campgrounds and outdoor sporting events. Government, educational and medical facilities are also discouraged. Compatible uses exist, but with specific construction and design to reduce noise levels, including manufacturing and retail facilities (Fort A.P. Hill, Guidelines, 2006).

Each of the fixed wing noise contours extends well beyond the Post’s boundaries as well as the three mile study area. These contours and the impacts that they represent have a great affect on resident’s quality of life in these areas. According to Table 6 (page 50), decibel levels range between 50 and 125. Utilizing Table 8 (page 51), there will definitely be a high level of annoyance. This seems to naturally preclude some types of land uses, especially residential and heavy commercial and retail development. Also, as these aircraft often carry live weapons for training purposes, safety is also an issue.

**Accident Potential Zones**

In addition to noise contours, the operations at Fort A.P. Hill also bring about the need for safety contours. Accident Potential Zones are designated by the Department of Defense in the vicinity of airfield runways. These areas are deemed to be where, if a problem developed, an aircraft mishap would likely occur. Accident Potential Zones (APZ) are most often found at take-off and landing portions of aircraft training and operation locations around the Post, as shown below in Map 9. These contours are located in various spots around Fort A.P. Hill and impede into the three mile study area. There are strong safety implications of an APZ, which can adversely affect a community. Development of all types is strongly advised to not take place within the defined Accident Potential Zones.
Map 9: Accident Potential Zones – Fort A.P. Hill

Map created by Beth J. Payne, VCU, March 2006
Light Pollution

One unique operation of Fort A.P. Hill is its role as the testing facility for night vision technology created at Fort Belvoir, Virginia. The Communications-Electronics Research, Development and Engineering Center, Night Vision and Electronic Sensors Directorate (CERDEC NVESD) is the department that is responsible for creating and testing this equipment. CERDEC NVESD has maintained a testing facility on Fort A.P. Hill for over 30 years, performing testing as well as evaluations of their night vision technology. Primarily the equipment is tested at the Assault Landing Zone and the Laser Range, which is located in the northwest quadrant of the installation. Testing includes low flying helicopters and Unmanned Aerial Vehicles and sensitive electro-optics equipment (Fort A.P. Hill, Image, 2006).

The operations performed in association with this program require low light levels and sufficiently dark skies. Fort A.P. Hill is one of the few installations that can provide these conditions because, in recent years, development around other installations has diminished prime testing conditions. This function is critical to the mission of Fort A.P. Hill as well as to the overall readiness of the Nation’s military forces. As “light pollution” in the testing area increases, the Army’s ability to test this technology will erode. Map 10, provided by Fort A.P. Hill illustrates the impacts of light pollution on the Post. This map calculates the increase in light pollution from a residential development of 1,500 to 1,600 homes, in close proximity to Fort A.P. Hill (approximately 2 miles in the northwest direction). It was calculated that this development would increase overall light levels by 19% across the complete Assault Landing Zone and would gradually decrease as light is diffused across the entire Post (Fort A.P. Hill, Image, 2006).

As for compatibility of land use with the issue of light pollution, it would be best for Fort A.P. Hill to keep the skies dark around the Post. As this significantly impacts development, it is best to judge this issue on a case by case basis. As developments are proposed in the areas surrounding Fort A.P. Hill, each can be examined based on the size of the development and its distance from the Post, as well as the impacts it may cause on the dark skies needed by Fort A.P. Hill.
LAND USE COMPATIBILITY

When compatible, civilian land uses can exist next to military installations without any negative effects. Incompatible land uses adjacent to military operations can cause interference; expose people to undue safety risks or simply cause a nuisance. Generally, Army activities raise compatibility issues when next to certain land uses:

- Noise sensitive uses, such as housing, schools, places of worship and medical facilities
- Uses that have high concentrations of people, like areas of high density residential, schools, churches
- Uses that interfere with air safety navigation, like tall buildings, uses that produce an excess of dust, light, smoke or uses that may impair vision

The military produces land use guidelines that help to determine what uses are appropriate under specific levels of noise and for safety concerns. General guidelines, as shown in Figure 4 in Appendix B, were produced in 1980 by the Interagency Committee on Urban Noise (FICUN). These are very basic and are subject to change based on military operations and more specific data sets. As local governments determine land use, it is necessary for local officials and planners to have all pertinent information. Then, when fully informed of noise levels and their planning implications, they can decide how to incorporate these noise contours into their planning process.

Existing Land Use Compatibility

As outlined, Fort A.P. Hill currently has seven contours related to noise. To determine land use compatibility within noise contours, several things must be reviewed: the current land use, the noise level, the level of annoyance and the area this contour covers. All of these items vary for each contour. For Accident Potential Zones (safety contours), there is less to analyze to determine capability, since there are only a few compatible uses within these zones that are encouraged by the military. The military advises to direct all development away from these zones, in an effort to avoid concentrations of people around these areas. Agricultural uses are most appropriate within Accident Potential Zones.

The initial review of existing land use, without yet considering the noise and safety contours, shows a good deal of development contiguous to Fort A.P. Hill’s boundaries.
While the land uses vary in nature, it should be noted that any development in such close proximity is guaranteed to experience impacts from the Post, including noise, access and safety implications. Continued development along the boundary of the Post is unwise.

The analysis of existing land uses in conjunction with the noise and safety contours shows few conflicts (as shown on Map 4 in Appendix A). Most of the land within the three mile study area is agricultural or rural, with a scattered pattern of residential uses. There is low density development, with homes on large lots. This is true of all of Essex, King George and Stafford Counties. Portions of Caroline and Spotsylvania Counties do present land use conflicts.

In the analysis of existing land use conflicts, there is little GIS data on existing land use for most of the counties within the three mile study area. For Caroline County, existing land use is based on tax map records. For the rest of the localities, zoning is used.

**Areas of Current Conflict**

*Bowling Green/Milford Primary Growth Area – Caroline County*

The Bowling Green/Milford Primary Growth Area, which includes the Town of Bowling Green, had 2,880 residents in 2000. This is 36 percent of the total population in the three mile study area. The large demolition contour, helicopter training path, a portion of the fixed wing contour for the Assault Landing Zone and an Accident Potential Zone all overlap the Growth Area as well as its immediate surroundings. (Map 5, in Appendix A, details this area.)

This area has incompatible land uses with Fort A.P. Hill’s operational impacts. Residential, commercial and industrial uses exist within the large demolition contour as well as the rotary contour. The Accident Potential Zone shows the most critical conflict within the Growth Area, as there is both commercial and residential development within this safety contour. The upper altitude (1700 – 3500 feet) fixed wing contour of the Assault Landing Zone overlaps the northern - most portion of the Growth Area. Currently, the northern - most section contains mostly vacant land, with a scattering of homes. Outside of the Growth Area, but still within the fixed wing contour, shows a greater concentration of residential uses. Residential and commercial uses are not deemed incompatible by the military, but it should be known that this area can experience significant noise levels during flight operations on the Post.
Northwest Area of Concern – includes both Caroline and Spotsylvania Counties

Another area of concern is the northwestern portion of the study area, which includes portions of both Caroline and Spotsylvania Counties. This area is overlapped by numerous contours including: the rotary contour, the Maneuver Lanes and the CACTF contours, the fixed wing contour at the Assault Landing Zone as well as two Accident Potential Zones. The sheer number of contours present in this area is alarming and makes it a critical area of compatibility. There is not a high density of people living here; instead it is a low density, scattered pattern of residential development within this area. Commercial uses are limited to a few ‘mom and pop’ type convenience stores. The most alarming compatibility issue is the development in the Accident Potential Zones (APZ). There should be no development within these zones and in this area of concern; there is existing residential and commercial development. In the APZ for the Assault Landing Zone, there is a high concentration of residents, including a mobile home park.

The lower altitude (<1700 feet) fixed wing contour for the Assault Landing Zone also shows a concentration of residential and industrial uses. Industrial uses are compatible, but the residential uses with this contour should be avoided. It is noted by Fort A.P. Hill that approximately 25% of people on the ground within this contour will have concern, complain or be upset by military aircraft (Fort A.P. Hill, Guidelines, 2006). The rotary wing flight path, maneuver lanes and CACTF contours in this area contain predominately residential uses. Residential uses within these contours will be affected by these military operations and can experience a significant level of noise during operations at the Post (Illustrated in Map 6 in Appendix A).
Future Land Use Compatibility

By utilizing GIS capabilities, Fort A.P. Hill’s existing noise and safety contours were overlaid with future land use designations (Map 7 in Appendix A). This overlay, in conjunction with the details of the land use designations and military contours, allows the determination of future land use conflicts.

The overall land use within the three mile study area is designated to stay predominately agricultural and rural in the future. This causes less concern when overlaid with noise and safety contours, because there are few people living and working in these areas.

Though, while the general character of the study area is rural, when reviewing the future land use data, there continue to be the same two areas of concern: the northwestern portion of the study area that lies within Spotsylvania and Caroline Counties and the Bowling Green/Milford Primary Growth area that includes the Town of Bowling Green. An additional area of concern is added when reviewing the future land use plan, which is the Skinker’s Neck Secondary Growth Area.

Areas of Future Conflict

Bowling Green/Milford Primary Growth Area – Caroline County

The Bowling Green/Milford Primary Growth Area is part of Caroline County’s Primary Growth Area. The primary growth area is designated as the home to the majority of future residential and commercial development. To promote this, there is a utility phasing plan for the area, which stages the extension of public water and sewer lines over the next 25 years. Several large subdivisions have been approved for this area, which will add hundreds of homes in the next ten years. The Town of Bowling Green is also part of this Primary Growth Area. The Town only has a few tracts of large land available for development, most of them adjacent to the Fort A.P. Hill boundary. Currently, much of this available land is held by developers, with plans for higher density, mixed use developments.

According to Caroline County’s comprehensive plan, this area has will have incompatible uses with Fort A.P. Hill’s operational impacts in the future (Map 8 in Appendix A). The Accident Potential Zone shows the most critical conflict within the Bowling Green/Milford Primary Growth Area, as there is both commercial and residential development planned within the safety zone. The upper altitude (1700 – 3500 feet) of the fixed wing aircraft contour at the Assault Landing Zone is located in the northern most section of the Growth Area. This is an area that is designated to contain a majority of the growth of
the County, even though military operations clearly impact this area. Also, there is still a major conflict with the defined Accident Potential Zone. This area is projected to consist of a mix of uses, though the military strongly advises that no development take place here.

The large demolition contour as well as the rotary contour covers a majority of this area. In a wise planning move, the bulk of this land is designated as Planned Unit Development. This gives the county and a potential developer increased resources to design a development, which can alleviate the impacts from Fort A.P. Hill.

**Northwest Area of Concern – includes both Caroline and Spotsylvania Counties**

The northwest area of concern is planned to be mostly agricultural and rural preservation. The cause for concern is with the land that is included in the Primary Settlement Area in Spotsylvania County. This district, due to its designation, is slated for development because of the existing water and sewer infrastructure. The major transportation corridor, Route 17, which runs through a portion of this area, is home to numerous commercial, residential and industrial developments. Farther north along the corridor a major commercial development is currently being built with over 1 million square feet of commercial space. A hospital and a commuter rail station are also proposed along the Rt. 17 corridor. This area was also the location of the proposed New Post community.

Fort A.P. Hill’s operational impacts, mainly due to the location of the Assault Landing Zone (ALZ), directly influence this area. (As shown in Map 9 in Appendix A) The ALZ’s associated noise and safety contours have direct impacts on the area and any potential development. Fort A.P. Hill’s key flight path is directly above this area. (Free Lance Star article on March 5th, 2006 provides more details. It is located in Appendix C). This area is also subject to Fort A.P. Hill’s concerns about light pollution, as their testing grounds are located in the northwest portion of the Post.

**Skinker’s Neck Secondary Growth Area – Caroline County**

The additional area of concern for future land use compatibility is the Skinker’s Neck Secondary Growth Area (Map 10 in Appendix A). There is concern due to the approved mixed use development of Haymount (labeled Planned Unit Development on Map 19) within the Growth Area. This single development will add 12,000 new residents in 4,000 residential units as well as retail uses. Schools and places of worship are also planned for Haymount. Fortunately, the New Urbanist design will utilize clustering to preserve open space and will help alleviate the military’s impacts.
The remainder of the Secondary Growth Area is designated Rural Preservation and is also located in the Resource Sensitive area. No future development is foreseen, but any new growth must be developed in accordance with the objectives set forth for the Resource Sensitive Area. Objectives include the use of innovative designs to encourage preservation of habitat and open space, the protection of archeological and environmental sites, and the limiting of access points to the Rappahannock River (Caroline County, 2001).

**FINAL ANALYSIS**

To conclude, an in-depth GIS analysis (detailed in Appendix D) was performed to ‘score’ specific contours in relation to their compatibility with specific land uses. This was done for both residential use (Map 11) and military described ‘sensitive uses’ (Map 12). ‘Sensitive uses’ includes high density residential and commercial development as well as churches, schools and hospitals. This analysis provides a clear picture of the military impacts on the land within the study area. Ultimately it is a visual representation of study area’s compatibility with Fort A.P. Hill’s operations.
Map 11: Residential Land Use Compatibility Assessment around Fort A.P. Hill

Map created by Beth J. Payne, VCU, April 2006

Map 11: Residential Land Use Compatibility Assessment around Fort A.P. Hill

Compatiblity Scores
Residential Use
- 0 - 6 (Most Compatible)
- 7 - 9
- 10 - 13
- 14 - 20 (Totally Incompatible)
- 3 Mile Buffer of Fort A.P. Hill

Source: Fort A.P. Hill and RADCO

Map created by Beth J. Payne, VCU, April 2006
Map 12: ‘Sensitive Use’ Land Use Compatibility Assessment around Fort A.P. Hill

Map created by Beth J. Payne, VCU, April 2006

Source: Fort A.P. Hill and RADCGR

Compatibility Scores
Sensitive Uses
- 0 - 6 (Most Compatible)
- 7 - 9
- 10 - 13
- 14 - 20 (Totally Incompatible)

3 Mile Buffer of Fort A.P. Hill
SUMMARY OF EXISTING CONDITIONS

Strengths

- Through local media attention, BRAC 2005 and increased population growth, Fort A.P. Hill is beginning to communicate with its surrounding localities.

- Fort A.P. Hill has updated their noise and safety contours and is beginning to distribute the information to surrounding localities. The Post is currently working on a set of land use guidelines that will better explain the impacts of the contours on land use decisions.

- There are tools available to assist in the localities effort towards compatible land uses around Fort A.P. Hill. In some localities, the tools are already in use or could be directed more specifically to deal with Fort A.P. Hill.

- There is not widespread military encroachment around the Base, because of the rural and suburban nature of the immediate area. Currently, encroachment is dealt with on a case-by-case basis. This plan to work towards compatibility of land uses is a proactive step, not reactive.

Weaknesses

- Many localities, though in close proximity to Fort A.P. Hill, do not acknowledge the Post’s existence in their plans or planning process. The coordination between Fort A.P. Hill and the localities is sporadic. There is a lack of awareness, little information exchanged (activities, relevant data), sporadic attendance at meetings and no coordination for comprehensive plan updates.

- Currently, there are areas with incompatible development around Fort A.P. Hill. A review of future land use around the Post also reveals potential incompatible land uses.

Opportunities

- Most localities are in some stage of updating their comprehensive plan. This is the opportune time to increase awareness of Fort A.P. Hill and to integrate the Post’s data into their plans.
The media has been covering issues that have occurred between the localities and Fort A.P. Hill in the last year. The increased media coverage has led to the public becoming more aware of its existence in the region and the effects of development in close proximity to the Post. The continued role of the media is important to the cause of military encroachment.

**Threats**

- The growing population, especially in the rural localities, will increase the development pressure. This is an increased risk to the developable land around the Post.

- There is concern of local government officials that Fort A.P. Hill is infringing on their legal authority to handle the land use decisions in their locality. This concern leads to tension among officials.

- The future expansions of Fort A.P. Hill will only increase the need for compatible land use and plan integration.
PART TWO A JOINT LAND USE PLAN AND PROCESS
VISION

Fort A.P. Hill is acknowledged and respected as a regional facility, whose impacts are recognized as reaching across the borders of its county of residence. Fort A.P. Hill and the surrounding localities (Caroline, Essex, King George, Spotsylvania and Stafford Counties and the Towns of Bowling Green and Port Royal) actively participate in a coordinated, formalized planning process.

The public is informed of the military’s mission to better understand, support and tolerate its operations. Conservation is a clear priority and an ambition shared by both Fort A.P. Hill and the surrounding localities. With this motivation, innovative tools are jointly implemented to conserve land.

The Post and the localities work together to create and sustain a mutually beneficial relationship. Information is freely exchanged between the localities and the installation. Better land use decisions are made by the localities as they are fully equipped with all necessary information, including the significance of Fort A.P. Hill’s operations. The quality of life of the residents is valued and protected as is the Post’s mission to train the Nation’s soldiers.
Goal 1  A COLLABORATIVE RELATIONSHIP EXISTS BETWEEN EACH LOCALITY (CAROLINE, KING GEORGE, ESSEX, STAFFORD AND SPOTSYLVANIA COUNTIES AND THE TOWNS OF BOWLING GREEN AND PORT ROYAL) AND FORT A.P. HILL.

**Objective 1.1** The Region surrounding Fort A.P. Hill works collectively with the Post on relevant issues.

**Strategy 1.1-1:** A Joint Planning Committee (JPC) exists; who meet to discuss relevant issues on a regular basis. Issues include infrastructure extensions; future locations of critical sites including schools and hospitals; new development projects; military expansion plans and future on-post operations.

*Implementation:* Local elected officials, county administrators, planning staff and military officials from Fort A.P. Hill will form a working committee that meets monthly.

*Implementation:* The Joint Planning Committee will appoint additional members of the community to the Committee. Members may include representation from: citizens, business owners, the Chamber of Commerce, the Planning District Commission (RADCO), the Fredericksburg Area Builders Association and the Fredericksburg Area Association of Realtors.

**Strategy 1.1-2:** A Department of Defense Joint Land Use Study is pursued.

*Implementation:* The newly formed Joint Planning Committee will apply for grant assistance from the Office of Economic Adjustment to complete a Joint Land Use Study. Guidelines on a Joint Land Use Study are provided in the Appendix E.

**Strategy 1.1-3:** A general Memorandum of Agreement exists, which establishes communication procedures.

*Implementation:* A MOA will be signed by each participating locality and Fort A.P. Hill. This document acts as a good faith document that arranges and formalizes the newly established communication procedures and roles established. A sample MOA is provided in Appendix E.

**Objective 1.2**  Fort A.P Hill has a larger role in each locality’s planning process.

**Strategy 1.2-1:** Fort A.P. Hill is involved in development review in each locality.

*Implementation:* Each locality’s planning department will add Fort A.P. Hill as a member of the County’s Technical Review Board (or similar entity). The Post will follow all associated procedures of this entity.
Strategy 1.2-2: A military representative exists that can be consulted on land use issues for the localities.

*Implementation:* The Joint Planning Committee will appoint a military liaison to work, one on one, with Localities on land use questions. This includes interpretation of military data as well as site specific questions and military operations issues.

Strategy 1.2-3: Fort A.P. Hill has a role in the comprehensive planning update process in each locality.

*Implementation:* Localities will allow Fort A.P. Hill to review and comment on applicable comprehensive plan updates.

Goal 2 THERE IS A STRUCTURED FLOW OF INFORMATION BETWEEN FORT A.P. HILL, THE LOCALITIES AND THE PUBLIC.

**Objective 2.1** Each locality has all necessary information concerning Fort A.P. Hill that is needed for planning purposes.

**Strategy 2.1-1:** Data is distributed and/or developed that is valuable to the localities when make land use decisions.

*Implementation:* Fort A.P. Hill will develop GIS data and hardcopy maps to distribute to the localities that are civilian friendly and easily understandable by localities and the public.

*Implementation:* Fort A.P. Hill will complete and distribute guidelines that detail the desired, appropriate land uses within the noise and safety contours.

**Strategy 2.1-2:** Local economic development departments are provided with data on the needs of the Post to work towards recruiting businesses that will benefit the locality and the Post.

*Implementation:* The JPC will establish a point of contact between Fort A.P. Hill and each local economic development office and the Chamber of Commerce for the distribution of information. This includes a ‘wish list’ of businesses desired by the Post as well as times during the year that the Post has a visitors that may utilize various County services and businesses.

*Implementation:* Local economic development offices will develop brochures specifically for visitors/training groups that visit Fort A.P. Hill detailing local establishments and services. These brochures will be available on Post.

**Objective 2.2** Public awareness of military operations, impacts and encroachment issues is increased.
Strategy 2.2-1: Information will be distributed to the public to better inform them of the types and schedules of operations, the noise associated with specific operations and the areas of the community that may be affected.

Implementation: The JPC will create a white paper that discusses current military operations and their implications on the community. It will be posted on County websites and on Fort AP Hill’s website. Hard copies will also be available around the Region.

Strategy 2.2-2: A presentation on military encroachment will be given.

Implementation: The Joint Planning Committee will hold a public meeting with the purpose of educating the public on military encroachment and the importance of compatible development. Ultimately, this presentation can become literature for distribution.

Strategy 2.2-3: A staffed 24 hour ‘noise information line’ is available for inquires on the noise and vibrations experienced.

Implementation: Fort AP Hill will provide this service to residents and publicize it on their website and through other appropriate outlets.

Strategy 2.2-4: The local media will continue to be used to better inform the public on the operations and impacts Fort A.P. Hill has on the Region.

Implementation: Fort A.P. Hill will issue press releases and give interviews on appropriate military matters.

Objective 2.3 Developers as well as potential home and property buyers are provided with facts on military impacts and how they might affect a potential development.

Strategy 2.3-1: Provide developers and buyers with various types of information that detail the military noise and safety impacts and their areas of influence.

Implementation: Fort A.P. Hill incorporates a distinct section into their website that is devoted to addressing military operations as well their impacts on the public, which includes developers and potential residents. This will contain maps and descriptions of all noise and safety contours.

Implementation: Local planning departments will generate a developer’s checklist. This checklist will provide a comprehensive list of things that must be considered and reviewed before developing property in the area. See the sample in Appendix E.

Implementation: Local planning departments will develop a similar checklist for home buyers. This checklist will increase awareness of things to consider before purchasing a home in the area. See example in Appendix E.
Strategy 2.3-2: Provide a searchable database that allows developers and citizens to choose a parcel and determine if and what affects the military has on that parcel of land.

Implementation: Fort A.P. Hill will work with the planning department in each locality to determine how their noise and safety contours affect surrounding parcels. The local planning departments, with help from RADCO will link this information to each parcel record and ultimately, it will be a part of each locality’s Assessor’s database. This information will then be accessible by the public.

Goal 3 CONSERVATION EFFORTS WILL BE CONTINUED AROUND FORT A.P. HILL

Objective 3.1 The existing Army Compatible Use Buffer Program is strengthened.

Strategy 3.1-1: Recruit more agencies to join the existing conservation partnership.

Implementation: The Joint Planning Committee will identify potential agencies with similar conservation goals and work to enlist them in the partnership. Potential partners include state and local government agencies, land trust groups and private entities.

Strategy 3.1-2: Priorities will be set to guide the efforts of the Program.

Implementation: The Joint Planning Committee will work identify key parcels to acquire around the Post.

Strategy 3.1-3: Encourage the creation of the Purchase of Development Rights and Transfer of Development Rights programs in each locality.

Implementation: The Joint Planning Committee will educate local leaders and planning staff on these programs and highlight the success of these programs in other Virginia localities.

Strategy 3.1-4: Distribute information on applicable conservation programs to targeted landowners.

Implementation: The Joint Planning Committee will develop an information package to send the landowners of the identified and prioritized lands to conserve.

Strategy 3.1-5: Explore additional sources of funds for the purchase of conservation lands.

Implementation: The Joint Planning Committee using additional resources from the Regional Planning District Commission will work with existing
and potential partners to identify new funding sources. The option of fundraising for private donations, additional Department of Defense funding as well as additional state funding will be investigated.

**Objective 3.2** The public and localities are informed of conservation efforts.

**Strategy 3.2-1:** The media will be utilized to inform the public on the Conservation Partnership that Fort A.P. Hill has developed.

*Implementation:* The Joint Planning Committee will promote positive developments about the conservation program to the local media and encourage the localities to increase awareness of the program to its citizens.

**Goal 4** COMPATIBLE LAND USES ARE DETERMINED AND ENFORCED THROUGH THE COMPREHENSIVE PLAN AND ZONING ORDINANCE OF EACH LOCALITY.

**Objective 4.1** The newly created land use plan (Map 13) is integrated into the comprehensive plans and any other applicable plans.

**Strategy 4.1-1:** Plans in each locality should include identification of new land use designations within Fort A.P. Hill’s three mile area of influence.

*Implementation:* Local planning departments should amend their comprehensive plans to complement the newly created preferred land use plan. Each locality will include similar land use designations and also detail density and land use requirements that avoid future land use conflicts with Fort A.P. Hill.

**Strategy 4.1-2:** Areas that have been identified as having current land use compatibility conflicts will be sent information on their situation and ways to better co-exist with the Post.

*Implementation:* Local planning departments will send a letter to each landowner within the military’s areas of influence, noting changes to the comprehensive plan as it affects their land. Informational literature developed by the Joint Planning Committee will also be included.

**Strategy 4.1-3:** Those lands that have the greatest conflict with the Post will be approached about the purchase of their property.

*Implementation:* The Joint Planning Committee will work to develop a list to identify and prioritize the lands that currently have the greatest conflict with the Post.

*Implementation:* Landowners of high priority lands will be approached by local officials with information regarding potential acquisition to gauge
their interest. They will be informed on available options - conservation easements, purchase, lease or acquisition through eminent domain.

**Objective 4.2**  
The zoning ordinance is utilized to achieve land use compatibly.

**Strategy 4.2-1:** The zoning ordinance in each locality enforces the newly created land use plan.

*Implementation:* Each locality will amend their zoning ordinance, following the proper procedure, to reflect all comprehensive plan changes.

**Strategy 4.2-2:** Flexible zoning is employed to alleviate military operational impacts.

*Implementation:* Local planning departments will create a flexible zoning overlay district for the designated growth and development areas surrounding Fort A.P. Hill. This zoning district will allow for clustering of uses and innovative site design.

**Goal 5**  
THE UTILIZATION OF NEW TOOLS WILL ASSIST IN THE COMPATIBLE DEVELOPMENT AROUND FORT A.P. HILL

**Objective 5.1**  
Real estate disclosure is utilized.

**Strategy 5.1-1:** Require real estate agents and developers to disclose information on military noise and safety contours.

*Implementation:* Local planning departments will distribute all information developed about the impacts of military operations to the Fredericksburg Area Association of Realtors and the Fredericksburg Area Builders Association. This information includes maps and descriptions of the noise and safety contours and their associated effects. This information will then be required to be posted in real estate offices and model homes complexes.

**Strategy 5.1-2:** Require a disclosure statement to be linked with parcels affected by Fort A.P. Hill’s noise and safety contours.

*Implementation:* Localities will require that a disclosure statement (see example in Appendix E) be included on the deed for the property and recorded by the locality. It should be included on the parcel map as well.

**Objective 5.2**  
A light and glare ordinance is adopted.

**Strategy 5.2-1:** Encourage the adoption of a light and glare ordinance in each locality.
Implementation: The Joint Planning Committee will explore best practices of light ordinances around military bases to craft a light and glare ordinance that will protect Fort A.P. Hill’s night vision testing center, while also allowing development to occur in localities.

Implementation: Each locality will adopt the light and glare ordinance and inform and educate the public on its existence and purpose.

**Objective 5.3** Noise management techniques are employed in the areas affected by the Post’s operations.

**Strategy 5.3-1:** Encourage builders/developers to incorporate construction techniques that will reduce sound and vibration in new homes within designated areas that are affected by Post operations.

Implementation: The Joint Planning Committee will investigate the use of such building techniques in other areas of the country.

Implementation: The Joint Planning Committee will work with local building officials and the Fredericksburg Area Builders Association to educate them on these construction techniques.

Implementation: The Joint Planning Committee will explore the feasibility of amending the County’s building codes to incorporate these noise mitigation techniques.

Implementation: The Joint Planning Committee will produce incentives to encourage the use of these building techniques.

**Strategy 5.3-2:** A noise easement will be required by each locality for areas affected by Fort A.P. Hill’s operations.

Implementation: The Joint Planning Committee will work to create an applicable noise easement program for the localities to adopt.

**Objective 5.4** Site plan submissions will include the acknowledgment of military impacts on their proposed development.

**Strategy 5.4-1:** Site plans will be required to label any applicable noise contours, Accident Potential Zones as well as noise and conservation easements. Parcels that are affected are clearly specified.

Implementation: The Joint Planning Committee in coordination with local planning departments and the Fredericksburg Area Builders Association will hold a workshop for builders and developers to educate them on the new site plan requirements. This workshop will encourage the use of newly created tools to assist them with the additional site plan requirements. These tools include the newly published literature (maps and landuse guidelines) on military impacts, the newly appointed military liaison who can answer questions and the searchable database which details Fort AP Hill’s impacts and/or restrictions by parcel.
Goal 6  OPERATIONAL MODIFICATIONS ARE INCORPORATED BY FORT A.P. HILL TO MINIMIZE NOISE AND SAFETY IMPACTS EXPERIENCED BY THE LOCALITIES.

Objective 6.1  When feasible, flight operations are modified to minimize impacts on already developed areas.

Strategy 6.1-1: Explore any technically feasible flight modifications over developed areas of the Region to the minimum levels necessary to support Fort A.P. Hill’s mission.

Implementation: Fort A.P. Hill will work with military officials to determine any possible flight modifications to their training operations. The Joint Planning Committee will be kept up to date on their progress.

Objective 6.2  Further source mitigation for noise generating operations is employed.

Strategy 6.2-1: Explore noise mitigation strategies that would not degrade the Post’s mission, but may help reduce noise complaints, through the examination of best practices at other Army Post’s around the country.

Implementation: Fort A.P. Hill will investigate and implement any feasible noise mitigation strategies.
LAND USE COMPATIBILITY PLAN

This map depicts a scenario of future growth that limits impacts on Fort A.P. Hill and balances each locality’s desire to grow. To arrive at this scenario, numerous data sets were studied:

- Conservation Lands
- Military noise and safety contours and their associated development guidelines
- Area of existing and future land use compatibility conflicts
- Existing growth boundaries
- Existing development
- The compatibility ‘scores’ of the noise and safety contours as they relate to residential and ‘military sensitive’ land uses.

The resulting Land Use Plan, shown in Map 13, organizes the three mile study area into a series of land use zones. Each zone represents a compromise between local land use decisions and military operations, illustrating where a locality can grow while minimizing the operations of the military on their residents. This Plan is to be utilized as a framework for determining land use guidelines in the future as well as to aid in the current decision making process. This map represents a pattern of future development, illustrating where development may be inappropriate, areas that can be developed but with constraints and lands that should be fully developed.

Each new land use zone represents a specific level of future development. There are tools that should be utilized within each land use zone, to allow for the most effective and compatible development. These tools include real estate disclosure, light ordinance, noise easements, deed restriction, etc. Table 9, below, provides a complete look at each land use zone and the most functional tools to be employed.
Map 13: The Land Use Plan
### Table 9: The Land Use Plan

<table>
<thead>
<tr>
<th>Land Use Zone</th>
<th>Purpose</th>
<th>Map Color</th>
<th>Tools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growth Opportunity Area</td>
<td>To accommodate future development in the locality. Encourage higher densities as well as residential and commercial growth in this area.</td>
<td></td>
<td>Comply with all development rules (floodplain, RMA, RPA). If within noise contours, encourage the use of real estate disclosure. Enforce light ordinance.</td>
</tr>
<tr>
<td>Limited Growth Area</td>
<td>Recognizes that operational impacts from Fort A.P. Hill may be severe enough to affect certain uses and that military operations should be disclosed</td>
<td></td>
<td>Discourage the new development of noise sensitive uses including high density housing, churches, schools, and medical facilitites. Encourage building codes standards that require noise and vibration reduction measures. Require real estate disclosure. Require noise easements. Enforce light ordinance. Encourage compatible uses in this area including light industrial, office and retail, recreation, and agricultural uses. Utilize flexible zoning to promote clustered design</td>
</tr>
<tr>
<td>Primary Protection Area</td>
<td>Corresponds to lands that fall inside of the designated Accident Potential Zones as well as the fixed wing &lt;1700 feet contour around the Assault Landing Zone</td>
<td></td>
<td>Discourage all residential, office and retail, cultural and recreational uses in this area Utilize acquisition tools such as transfer or purchase of development rights and voluntary acquisition. Encourage agricultural and industrial uses in this area. Utilize building codes standards that require noise and vibration reduction measures. Require noise easements Require real estate disclosure</td>
</tr>
<tr>
<td><strong>Conservation Opportunity Area</strong></td>
<td>Areas that are of an environmental interest and are located in close proximity to established conservation lands. May alleviate some impacts of the installation</td>
<td>Encourage the use of all conservation tools – including acquisition, purchase or transfer of development rights and conservation easements.</td>
<td></td>
</tr>
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<td>----------------------------------</td>
<td>-------------------------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td><strong>Compatible Areas</strong></td>
<td>Areas that are currently compatible with the Post and are designated so they will continue to be compatible in the future</td>
<td>Comply with all existing zoning, comprehensive plan policy and development standards.</td>
<td></td>
</tr>
<tr>
<td><strong>Post Influence Area</strong></td>
<td>A half mile buffer around Fort A.P. Hill that recognizes that development adjacent to the Post’s borders can create security and access issues</td>
<td>Encourage compatible uses in this area such as agricultural, low density residential, manufacturing and recreational uses. Discourage high density uses.</td>
<td></td>
</tr>
</tbody>
</table>
# IMPLEMENTATION

## Table 10: Implementation Schedule

### Phase One

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Description</th>
<th>Responsible Party</th>
<th>Start</th>
<th>Finish</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1-1</td>
<td>Joint Planning Committee (JPC)</td>
<td>Localities and Fort AP Hill</td>
<td>Immediately</td>
<td>6 Mos.</td>
</tr>
<tr>
<td>1.1-2</td>
<td>Joint Land Use Study</td>
<td>JPC</td>
<td>6 Mos.</td>
<td>Ongoing</td>
</tr>
<tr>
<td>1.1-3</td>
<td>Sign MOA</td>
<td>Localities and Fort AP Hill</td>
<td>Immediately</td>
<td>6 Mos.</td>
</tr>
<tr>
<td>1.2-1</td>
<td>Development Review</td>
<td>Localities</td>
<td>Immediately</td>
<td>3 Mos.</td>
</tr>
<tr>
<td>1.2-2</td>
<td>Military liaison</td>
<td>JPC</td>
<td>6 Mos.</td>
<td>9 Mos.</td>
</tr>
<tr>
<td>1.2-3</td>
<td>Comprehensive Plan Review</td>
<td>Localities and Fort AP Hill</td>
<td>Immediately</td>
<td>6 Mos.</td>
</tr>
<tr>
<td>2.1-1</td>
<td>GIS data development and distribution</td>
<td>Fort AP Hill</td>
<td>Immediately</td>
<td>1 year</td>
</tr>
<tr>
<td>2.2-3</td>
<td>Noise information hotline</td>
<td>Fort AP Hill</td>
<td>3 Mos.</td>
<td>6 Mos.</td>
</tr>
<tr>
<td>2.2-4</td>
<td>Media coverage</td>
<td>Fort AP Hill</td>
<td>Immediately</td>
<td>Ongoing</td>
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<tr>
<td>4.1-1</td>
<td>Integrate new land use designations into applicable plans</td>
<td>Local planning departments</td>
<td>9 Mos.</td>
<td>12 Mos.</td>
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### Phase Two

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<th>Description</th>
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<th>Finish</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1-2</td>
<td>Economic Development collaboration</td>
<td>Local Economic Development offices, Chamber of Commerce and Fort AP Hill</td>
<td>1 year</td>
<td>2 years</td>
</tr>
<tr>
<td>2.2-1</td>
<td>Public Information Created</td>
<td>JPC</td>
<td>1 year</td>
<td>2 years</td>
</tr>
<tr>
<td>2.2-2</td>
<td>Public Presentation</td>
<td>JPC</td>
<td>2 year</td>
<td>2.5 years</td>
</tr>
<tr>
<td>2.3-1</td>
<td>Target developers and potential home buyers with information on AP Hill impacts</td>
<td>Fort AP Hill and local planning departments</td>
<td>2 years</td>
<td>3 years</td>
</tr>
<tr>
<td>3.1-1</td>
<td>Recruit new conservation partners</td>
<td>JPC</td>
<td>1 year</td>
<td>Ongoing</td>
</tr>
<tr>
<td>3.1-2</td>
<td>Priorities set for conservation program</td>
<td>JPC</td>
<td>1 year</td>
<td>2 years</td>
</tr>
<tr>
<td>3.1-3</td>
<td>Creation of conservation programs</td>
<td>JPC, elected official and local planning departments</td>
<td>1 year</td>
<td>3 years</td>
</tr>
<tr>
<td>3.1-5</td>
<td>Explore funding sources</td>
<td>JPC, RADCO</td>
<td>1 year</td>
<td>Ongoing</td>
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<tr>
<td>3.2-1</td>
<td>Publish conservation success stories in the media</td>
<td>JPC, Fort AP Hill</td>
<td>1.5 years</td>
<td>Ongoing</td>
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<tr>
<td>4.1-2</td>
<td>Information to property owners with incompatible land uses</td>
<td>Local planning departments</td>
<td>2 years</td>
<td>3 years</td>
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<td>4.2-1</td>
<td>Amend zoning ordinance</td>
<td>Local planning departments</td>
<td>1 year</td>
<td>1.5 years</td>
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<td>4.2-2</td>
<td>Flexible Zoning</td>
<td>Local planning departments</td>
<td>1.5 years</td>
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<td>Strategy</td>
<td>Description</td>
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<tr>
<td>5.1-1</td>
<td>Real estate agents and developers will disclose military impacts</td>
<td>Local planning departments, FAAR, FABA</td>
<td>2 years</td>
<td>Ongoing</td>
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<tr>
<td>5.2-1</td>
<td>Light and glare ordinance</td>
<td>JPC, local planning departments</td>
<td>1 year</td>
<td>3 years</td>
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<tr>
<td>5.3-2</td>
<td>Noise Easement</td>
<td>Localities and JPC</td>
<td>1 year</td>
<td>3 years</td>
</tr>
<tr>
<td>5.4-1</td>
<td>Site plan modifications</td>
<td>JPC, FABA, local planning departments</td>
<td>1 year</td>
<td>2 year</td>
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</table>

**Phase Three**

<table>
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<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>2.3-2</td>
<td>Searchable database</td>
<td>Local planning department, Fort AP Hill, RADCO</td>
<td>3 years</td>
<td>5 years</td>
</tr>
<tr>
<td>4.1-3</td>
<td>Assess property owners interest in acquisition</td>
<td>JPC, local officials</td>
<td>3 years</td>
<td>5 years</td>
</tr>
<tr>
<td>5.1-2</td>
<td>Disclosure statement linked with parcels</td>
<td>Localities</td>
<td>3 years</td>
<td>4 years</td>
</tr>
<tr>
<td>5.3-1</td>
<td>Encourage use of sound mitigation construction techniques</td>
<td>Localities and FABA</td>
<td>3 years</td>
<td>5 years</td>
</tr>
</tbody>
</table>

Abbreviations:

- **JPC** Joint Planning Committee
- **RADCO** Regional Planning District Commission
- **FABA** Fredericksburg Area Builders Association
- **FAAR** Fredericksburg Area Association of Realtors
PART III - APPENDIX
APPENDIX A: ADDITIONAL MAPS

Map 1: Town Of Bowling Green – Future Land Use

Map created by Beth J. Payne, VCU, April 2006
Map 2: Conservation Lands within the Three Mile Study Area of Fort A.P. Hill

Map created by Beth J. Payne, VCU, March 2006

Source: Department of Conservation and Recreation
Map 3: Locations of Re-Zonings in Relation to Fort A.P. Hill
Map 4: Existing Land Use with Noise and Safety Contours
Map 5: Bowling Green/Milford Primary Growth Area

Existing Land Use Compatibility

Map created by Beth J. Payne, VCU, March 2006
Map 6: Northwestern Area
Existing Land Use Compatibility

Map created by Beth J. Payne, VCU, March 2008
Map 7: Future Land Use and Noise and Safety Contours

Map created by Beth J. Payne, VCU, March 2006
Map 8: Bowling Green/Milford Primary Growth Area - Future Land Use Compatibility

Map created by Beth J. Payne, VCU, March 2006
Map 9: Northwestern Area - Future Land Use Compatibility

Map created by Beth J. Payne, VCU, March 2006
Map 10: Skinker’s Neck Secondary Growth Area - Future Land Use Compatibility

Map created by Beth J. Payne, VCU, March 2006
## APPENDIX B: NOISE & LAND USE INFO

**Figure 1: Common Sounds and Noise Levels (A-Weighted)***

<table>
<thead>
<tr>
<th>Noise Source (at a given distance)</th>
<th>Typical Reaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Civil Defense Sirens (100 ft)</td>
<td>140</td>
</tr>
<tr>
<td></td>
<td>Pain</td>
</tr>
<tr>
<td>Jackhammer (50 ft)</td>
<td>130</td>
</tr>
<tr>
<td></td>
<td>Maximum Vocal Effort</td>
</tr>
<tr>
<td>Pile Driver (50 ft)</td>
<td>110</td>
</tr>
<tr>
<td>Ambulance Sirens (100 ft)</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Very Annoying/ Discomfort</td>
</tr>
<tr>
<td>Motorcycle (25 ft)</td>
<td>90</td>
</tr>
<tr>
<td>Power Lawnmower</td>
<td></td>
</tr>
<tr>
<td>Garbage Disposal (1 ft)</td>
<td>80</td>
</tr>
<tr>
<td>Alarm Clock</td>
<td></td>
</tr>
<tr>
<td>Vacuum Cleaner (3 ft)</td>
<td>70</td>
</tr>
<tr>
<td></td>
<td>Intrusive</td>
</tr>
<tr>
<td>Normal Conversation (5 ft)</td>
<td>60</td>
</tr>
<tr>
<td>Dishwasher</td>
<td></td>
</tr>
<tr>
<td>Light Traffic (100 ft)</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>Normal Speech</td>
</tr>
<tr>
<td>Bird Calls (Distance)</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>Quiet</td>
</tr>
<tr>
<td>Soft Whisper (5 ft)</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Human Breathing</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Just Audible</td>
</tr>
</tbody>
</table>

Source: Flint Hills Joint Land Use Study, 2005
Figure 2: Blast Noise Guidelines

<table>
<thead>
<tr>
<th>Predicted sound level in decibels</th>
<th>Risk of complaints and damage</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;115</td>
<td>Low risk of noise complaints</td>
</tr>
<tr>
<td>115 – 130</td>
<td>Moderate risk of noise complaints</td>
</tr>
<tr>
<td>130 – 140</td>
<td>High risk of noise complaints, possibility of damage</td>
</tr>
<tr>
<td>&gt;140</td>
<td>Threshold for permanent physiological damage to unprotected human ears. High risk of physiological and structural damage claims.</td>
</tr>
</tbody>
</table>

Figure 3 is a set of guidelines developed by Naval Surface Warfare Center, Dahlgren, Virginia that evaluates complaint potential that are caused by activities such as detonating explosives.


Figure 3: Percentage of Population Highly Annoyed from Small Arms Range Noise

<table>
<thead>
<tr>
<th>Decibels (dBA)</th>
<th>Percent highly annoyed</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;63</td>
<td>2</td>
</tr>
<tr>
<td>63</td>
<td>10</td>
</tr>
<tr>
<td>65</td>
<td>13</td>
</tr>
<tr>
<td>70</td>
<td>21</td>
</tr>
<tr>
<td>75</td>
<td>29</td>
</tr>
<tr>
<td>80</td>
<td>38</td>
</tr>
</tbody>
</table>

Figure 4 is from a Swedish study that details annoyance levels of the population based on small arms fire. It illustrates that annoyance from small arms fire is rather low until 63 decibels. As the noise increase above 63 dB, annoyance increases rather quickly.

Figure 4: Land Use Compatibility Guidelines

<table>
<thead>
<tr>
<th>FICUN</th>
<th>NZ I</th>
<th>NZ II</th>
<th>NZ III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Households</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Retail – General</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Restaurants</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Personal Services</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Hospitals</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Government</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Education</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Public Assembly</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Parks</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Agriculture</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
</tbody>
</table>

Source: Flint Hills Joint Land Use Study, 2005
APPENDIX C: MEDIA

Free Lance Star Article – March 5th, 2005

A. P. Hill flight path discussed
March 5, 2006 12:50 am
By GEORGE WHITEHURST

No one riding down State Route 2 or along U.S. 17 can ignore Fort A.P. Hill--a sprawling, 76,000-acre military training post in Caroline County. Signs clearly mark its boundaries on the ground, but it's the post's boundaries in the sky that have some supervisors in Spotsylvania County fired up. A map county officials saw at a recent planning summit shows a flight noise impact zone that extends from the post up the U.S. 17 Bypass almost to Interstate 95.

Several supervisors envision the U.S. 17 Bypass between U.S. 1 and the New Post crossroads as an economic development engine for the county. They hope that a proposed hospital at the intersection of the bypass and I-95 will anchor a host of medical support facilities and other professional offices.

The county's comprehensive plan also projects that schools will be needed in that area in the coming years.

A.P. Hill officials said recently they have no problem with the development of medical offices, industrial sites and other businesses along the corridor.

But they balk at the prospect of schools and more houses in the part of the zone nearest New Post, which lies beneath the flight path of large military cargo aircraft such as C-17s and C-130s.

And therein lies a recipe for conflict with the Spotsylvania supervisors.

A.P. Hill spokesman Ken Perrotte said recently that post officials have met with representatives from HCA to discuss its proposed Spotsylvania Regional Medical Center.

The military officials made it clear they consider the hospital compatible with A.P. Hill's mission.

"There was good dialogue with the hospital folks," said Perrotte, who didn't attend the meeting.

A.P. Hill won't oppose the hospital, which falls just outside the flight path.

"From what I hear now, I don't see that happening," Perrotte said.

And that's good news for Bryan K. Dearing, chief executive officer of the planned medical center, who described as "cordial" his meeting with A.P. Hill commander Lt. Col. James Mis.

"What we got from him was some reassurance that even though there might be some concern about other developments along [the U.S. 17 Bypass], a hospital would be OK," Dearing said.

Indeed, A.P. Hill officials might find an adjacent hospital useful for treating troops wounded during training exercises.

"We don't have a hospital at A.P. Hill," Perrotte said. "The availability of capable medical facilities nearby--we would view that as an asset."

Perrotte indicated that Mis and other military leaders also see no problem with the development of medical offices along the bypass.

Military officials increasingly are identifying so-called "compatible-use buffers" around the perimeters of the installations they run.

The sizes and shapes of the buffers vary depending on the hazard levels of training exercises, the intensity and direction of sound waves generated by explosions or aircraft engines, and other factors.

Because A.P. Hill conducts several types of training exercises, it has used federally funded research to identify its impact zones.

A.P. Hill's noise impact zone is split into two categories, based on the amount of noise generated by aircraft at a specific altitude.
One portion—colored tan on maps provided by the Army—represents the area over which aircraft will travel at approximately 3,500 feet above ground level. The second portion—colored red—represents the area over which aircraft will fly at 1,700 feet or less.

Much of the area where support businesses for the medical center might develop falls within the tan zone, and A.P. Hill officials have few objections to development in that area.

But the New Post area lies in the red zone.

Last year, Spotsylvania-based Tricord Inc. asked supervisors to rezone 418 acres of an abandoned gravel quarry there to allow a 1,500-home community-style subdivision.

A.P. Hill officials objected, saying the community would be too close to the military post and would interfere with training exercises. Supervisors rejected Tricord's rezoning request, and some mentioned the Army's opposition as a reason.

But the county's long-range plans still say schools might be needed in the red zone.

"We would recommend against that based on the fact that it's in the direct flight path of military aircraft," Perrotte said.

The problem, according to the Army, is the noise, not the safety of the aircraft flying overhead. Sergio Sergi, one of A.P. Hill's environmental specialists, stressed that the New Post area falls outside the zone in which aircraft accidents are most likely to occur.

But the noise generated by rapidly descending aircraft in the red zone would disrupt the learning environment for schoolchildren, he said. Studies indicate that the noise generated by aircraft flying overhead at 1,700 feet will bother about 25 percent of the people below it.

Therefore, a school represents "incompatible development" within the red zone of the flight path.

Those arguments don't wash with Board of Supervisors Chairman Hap Connors, who likes the idea of clustering an elementary school, a middle school and a high school on one parcel somewhere near the New Post crossroads.

"That's smart management and that's good government, and it will save taxpayers a lot of money in the long term. I would fully support that," he said recently. "At the same time, I'm hearing from A.P. Hill that they don't want that to happen within their so-called flight zone. That bothers me because they are basically trying to veto a land-use decision, and a smart government solution."

On the other hand, Lee Hill District Supervisor Vince Onorato, in whose district the New Post site falls, appears willing to defer to military planners on the question of schools in that area.

"I would think that the U.S. Army would have a better understanding of safety concerns in the adjacent land area than I would," he said recently.

Connors said he respects "the work that A.P. Hill personnel do on behalf of the country. But I do think if they want to downzone land in Spotsylvania or prohibit development, that the federal government should compensate landowners."

In an e-mail message, Mis responded to Connors.

"It is important for people to understand that Fort A.P. Hill is simply trying to protect America's investment in military readiness and ensure our military men and women have the tools necessary to survive and win on the battlefield," he wrote.

Mis also noted that zoning decisions are the prerogative of local governments, but called on them to make responsible decisions.

"We hope our community partners would be proud so much work that is important to saving American lives in combat and winning the peace globally takes place right here in a corner of Caroline County," he concluded. Some have suggested A.P. Hill could eliminate potential conflicts with Spotsylvania leaders simply by rotating its flight path, allowing aircraft to approach the landing strip through King George County instead of Spotsylvania.

Perrotte said that's impossible, because it would require a new landing strip running along a northeast-southwest axis.

"This isn't something where you can just say, 'We're going to clear-cut a mile of trees and create a new airstrip,'" he said.

That argument isn't sitting well with Supervisor Bob Hagan.

"If the flight path as it's currently configured is going to be detrimental to Spotsylvania, then perhaps it would be in the best interests in the county to have an independent determination of the viability of changing the flight path," he said.

To reach GEORGE WHITEHURST: 540/374-5438
Email: gwhitehurst@freelancestar.com
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Figure 5: Editorial Cartoon from the Free Lance Star, 10/9/06
APPENDIX D: GIS

Details on GIS Analysis Utilized for Compatibility Assessment

To better analyze the noise and safety contours and their relationship to land uses, I performed a more complex GIS analysis. Each noise contour was ‘scored’ based on its compatibility with residential land uses as well as ‘sensitive’ land uses. These military sensitive land uses are those that are of high intensity and high density including: schools, hospitals, places of worship and high density residential uses. The scores for each contour are shown below, in Table 1.

I used a 1 through 5 scoring system, with a ‘1’ representing a contour was totally compatible with said use and a ‘5’ representing a contour was totally incompatible with said use. The scores were based on military land use guidance provided to me by Fort A.P. Hill. To finish the analysis on the various noise and safety contours, I utilized the union tool in ArcGIS (Below, there is a description of the Union tool). This allowed all of the contours to be joined, and a summation of all scores could be tallied. The lower the total score, the more compatible the area was for a particular land use. The result was two maps that showed areas within the study area that did not work well with residential or military sensitive uses. This allowed me to develop a justified preferred land use plan for the study area.

<table>
<thead>
<tr>
<th>Contour</th>
<th>Residential Compatibility</th>
<th>Sensitive Use Compatibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accident Potential Zones</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Demolition:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>115 Contour Line</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>130 Contour Line</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Artillery:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>115 Contour Line</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>130 Contour Line</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>ALZ Fixed Wing:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Altitude below 1700 feet</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Altitude between 1700 and 3500 feet</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Bomb Run Fixed Wing</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Rotary Wing</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Maneuver Lanes</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>CACTF</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>
How Union Analysis works – from ArcGIS Desktop Help

Union calculates the geometric intersection of any number of feature classes and feature layers.

All inputs must be of a common geometry type and the output will be of that same geometry type. This means that a number of polygon feature classes and feature layers can be unioned together. The output features will have the attributes of all the input features that they overlap. Union does the following:

- Determines the spatial reference for processing. This will also be the output spatial reference. For details on how this is done, see Spatial Reference. All the input feature classes are projected (on the fly) into this spatial reference.

- Cracks and clusters the features. Cracking inserts vertices at the intersection of feature edges; clustering snaps together vertices that are within the cluster tolerance.

- Discovers geometric relationships (overlap) between features from all feature classes.

- Writes the new features to the output.

To explicitly control the output spatial reference (coordinate system and domains), set the appropriate environments, the Output Z Aware, and Output M Aware as desired. Note that the spatial reference used during processing is the same as the output spatial reference; therefore, all Input Features must be within the X, Y, Z, and M domains.

Union can run with a single input feature class or layer. In this case, instead of discovering overlap between the polygon features from the different feature classes or layers, it will discover the overlap between features within the single input. The areas where features overlap will be separated into new features with all the attribute information of the input feature. The area of overlap will always generate two identical overlapping features, one for each of the features that participates in that overlap.
APPENDIX E: COMPATIBILITY TOOLS

Sample Memorandum of Understanding

In many communities, local government has the power to regulate land use. These powers can include zoning, special permits, special projects, health codes, subdivision regulations, capital improvement projects, building codes, disclosure of noise levels, and public acquisition of land. It is important, when changes in land use or land use controls are being considered either on or off the installation, that the installation and the surrounding communities be informed and given the opportunity to comment on any resulting impacts on training capabilities or quality-of-life issues. The following is an example of an agreement that formalizes the relationship between the community and the installation and could be modified and adapted as necessary.

MEMORANDUM OF UNDERSTANDING
BETWEEN SHAW AIR FORCE BASE AND
THE CITY OF SUMTER, SUMTER COUNTY, AND THE SUMTER
CITY-COUNTY PLANNING COMMISSION

This Memorandum of Understanding between Shaw Air Force Base, the City of Sumter, Sumter City-County Planning Commission, and Sumter County, South Carolina is enacted to establish a mutually beneficial process that will ensure timely and consistent notification and cooperation between the parties on projects, policies, and activities. These parties have a mutual interest in the cooperative evaluation, review, and coordination of local plans, program, and projects of the City of Sumter, Sumter County, and Sumter City-County Planning Commission and Shaw Air Force Base.

The City of Sumter Sumter County, and Sumter City-County Planning Commission agree to:

1. Submit information to the Shaw Air Force Base Community Planner on plans, programs, actions, and projects which may affect Shaw Air Force Base and Poinsett Weapons Range. This may include, but is not limited to, the following:
   a. Development proposals
   b. Transportation improvements and plans
   c. Sanitary waste facilities
   d. Open space and recreation
   e. Public works projects
   f. Solid waste management proposals
   g. Land use plans and ordinances
   h. Rezonings and variances
   i. Subdivisions

2. Submit to the Shaw Air Force Base Community Planner for review and comment, project notification, policies, plans, projects, reports, studies, and similar information on land, facility, and environmental activities within the vicinity of Shaw Air Force Base and the Poinsett Weapons Range as identified on the map at Attachment 1.

3. Incorporate Shaw Air Force Base comments into local responses and reports, or if not accepted, submit written explanation stating reasons comments will not be incorporated at least five days prior to the decision.
4. Include the Shaw Air Force Base Community Planner in the distribution of meeting agendas for, but not limited to, the following:

a. Sumter City Council  
b. Sumter County Council  
c. Sumter City-County Planning Commission  
d. Sumter County Zoning Board of Adjustment  
e. Sumter City Zoning Board of Adjustment  
f. Sumter Subdivision/Planned Development Review Committee  
g. Sumter Urban Area Transportation Study Committee

Shaw Air Force Base agrees to:

1. Submit information to the Sumter City-County Planning Director on plans, programs, actions, and projects which may affect the City of Sumter and Sumter County. These may include, but are not limited to, the following:

a. Base Comprehensive Plans  
b. Withdrawals of public domain land for military use  
c. Air Installation Compatibility Use Zone (AICUZ) studies  
d. Substantial changes in existing installation use  
e. Appropriate data for local plans, programs, and projects

2. Submit to the Sumter City-County Planning Director for review policies, plans, projects, reports, studies, and similar information on land, facility, and environmental activities at Shaw Air Force Base and the Poinsett Weapons Range.

This agreement will remain in effect until terminated by any of the parties. Amendments to this Memorandum may be made by mutual agreement of all the parties. Review process details and appropriate forms may be developed to facilitate uniform and efficient exchange of comments. This agreement will not be construed to obligate the Air Force, the City of Sumter, Sumter County, or the Sumter City-County Planning Commission to violate existing or future laws and regulations.

This agreement is approved by:

By: ____________________________  
Title: Chairman, Planning Commission  
Date: ____________________________
Joint Land Use Study Guidelines

This results in public pressure on the military base commander to modify or curtail operations or transfer activities to other installations. Mission constraints can lead to base closure.

The commensurate reduction in installation personnel and mission activities can have a direct and detrimental effect on the jurisdiction through reduced economic activity and loss of jobs, impacting the local tax base and economic health. The extent of urban encroachment impacting the operational utility of an installation is one consideration in determining the future viability of an installation.

Is there a Solution to this dilemma? Through joint, cooperative military and community planning, growth conflicts can be anticipated, identified, and prevented. These actions help protect the installation’s military mission, and the public health, safety, quality of life and community economic stability.

The Department of Defense (DoD) supports several programs designed to provide technical information on noise and aircraft accident potential that communities can use to regulate urban encroachment while promoting economic growth and development.

The Air Installation Compatible Use Zone (AICUZ) and the Environmental Noise Management Program (ENMP): In the mid-1970’s, the DoD established programs in response to existing and potential threat of incompatible land development compromising the defense missions at military installations. These programs are designed to promote compatible development on and off military bases. The programs include noise propagation studies of military activities to delineate on- and off-base areas most likely to be affected by unacceptable noise levels. The programs also identify aircraft landing and take-off accident potential zones that often extend off a base into the neighboring community. The AICUZ/ENMP studies are based on sophisticated, computer based noise models, Federal Aviation Administration guidelines.
DoD Directives, and community land use planning principals and practices.

**Joint Land Use Study (JLUS) Program:** In 1985, Congress authorized the Department of Defense (DoD) to make community planning assistance grants Title 10 U.S.C. Section 2391 to state and local government to help better understand and incorporate the AICUZ/ENMP technical data into local planning programs. The Office of Economic Adjustment (OEA) manages the JLUS program.

**JLUS Program Purpose:** A JLUS is a cooperative land use planning effort between affected local government and the military installation. The recommendations present a rationale and justification, and provide a policy framework to support adoption and implementation of compatible development measures designed to prevent urban encroachment; safeguard the military mission; and protect the public health, safety, and welfare.

**JLUS Implementation Measures:** may involve revisions to the community’s comprehensive plan and traditional land use and development controls, such as zoning, subdivision regulations, structural height restrictions, and promotion of planned unit development concepts.

Additional actions may include amending local building codes to require increased sound attenuation in existing and new buildings, land exchanges, and transfer of development rights, and real estate disclosure

**JLUS Project Initiation:** When a Military Service believes an installation may be experiencing encroachment problems or that there is the likelihood for encroachment that could adversely affect the military mission, the Service may nominate the installations for JLUS to OEA. OEA staff visits the installation, meets with the local base command and local government officials. OEA will evaluate existing or potential encroachment problems, the availability of AICUZ/ENMP information, and local development controls to determine if a JLUS is justified. A JLUS will proceed if there is both base command and local jurisdiction interest.

JLUS assistance normally is technical, but can include funding as well through a Community Planning Assistance Grant.

**OEA Community Planning Assistance Grant:** The financial incentive for the community is a cost-shared Community Planning Assistance grant to support the cost of a JLUS. OEA makes the grant to a sponsoring jurisdiction.

**Study Sponsor:** Normally the local governing body with land development regulatory oversight serves as the sponsor, but it can be a state governmental organization, an airport authority, community planning office, regional planning agency, or a qualified council of governments.

The sponsor, working with OEA and the military base, develops a scope of work, outlines the study contents, including goals and objectives, phases of the study, methods of public involvement, and an implementation plan. The proposal also includes an estimate of the cost to produce the study, and the amount of local funds or in-kind resources that will be pledged by the sponsor. In-house staff can do the work or it can be a contracted effort with a consultant qualified in land use planning, zoning and environmental (principally noise) issues. Typical OEA funding assistance is on a matching dollar for dollar basis. A typical JLUS can cost between $60,000 and $120,000 depending on the complexity of the issues involved. OEA can contribute up to 75 percent of the cost to produce a JLUS. However, not all JLUS efforts require planning grants.

OEA technical assistance is available to help with the preparation of the scope of services and a grant application; to provide technical support and guidance during the JLUS; and serve as liaison between the Military Department, and the sponsoring jurisdiction if needed.
Consensus: An important ingredient of a successful JLUS is building community consensus. If the JLUS is to have positive results, the participating jurisdiction and military installation must agree to make a good faith pledge to implement development controls to achieve compatibility.

Program Experience: A JLUS is usually completed in 12-months, although the degree of coordination and complexity may require more or less time to achieve the necessary community consensus and action measures.

Experiences from these studies have shown a high success rate. The JLUS effort can directly benefit both the jurisdiction and the installation by:

- Protecting of the health and safety of residents living or working near military installations;
- Preserving long-term land use compatibility between the installation and the surrounding community;
- Promoting comprehensive community planning;
- Encouraging a cooperative spirit between the local base command and local community officials;
- Integrating the local jurisdiction’s comprehensive plans with the installation’s plans.

The following map indicates locations within the United States where JLUS projects have been completed or are in the developmental stages.

Completed Joint Land Use Studies

- Completed (1985-2004) 35

Office of Economic Adjustment

Office of Economic Adjustment—Joint Land Use Study Program

7/08/2004
Sample Developer’s Checklist

The Department of Defense (DoD) encourages any person marketing property for sale or rent within a noise zone, disclosure area, or Accident Potential Zone (APZ) to provide written disclosure of that fact to all prospective purchasers or lessees. Many neighbors of DoD installations/bases experience, to a greater or lesser extent, the impacts of training noise. Those who are considering property within a noise zone, disclosure area, or APZ require extra consideration and information. See the fact sheets titled “How does the DoD assess noise and its impacts?” and “What are Accident Potential Zones” for more information.

If you are proposing to develop and/or sell property in the vicinity of Fort/Base/Air Station/Camp __________ you need to know that certain guidelines and standards apply.

Is the property in a noise zone?
☐ The DoD recommends that noise-sensitive land uses (e.g., residences) be avoided in the high-noise zones surrounding Fort/Base/Air Station/Camp __________. A map of the noise zones surrounding the installation is available for review at the __________ office. If your property is located in a noise zone, you need to check local zoning ordinance to determine permitted uses. Some uses are permitted with appropriate sound-attenuation measures. You also need to check Federal Housing Administration (FHA) and Veterans Affairs (VA) mortgage requirements in high-noise zones.

Is the property in a disclosure area?
☐ Local, county or state governments may have designated disclosure areas around Forts, Bases, Air Stations, and Camps. These disclosure areas would be available a local, county or state planning and zoning offices.

The Army has delineated the Land Use Planning Zone (LUPZ) and/or Disclosure Area around its installations. Disclosure to potential buyers is recommended in these areas surrounding Fort/Camp __________. A map of Disclosure Areas is available for review at the __________

office. If your property is located in a Disclosure Area, you need to check local zoning ordinance to determine requirements.

Is the property in an Accident Potential Zone (APZ)?
☐ The DoD recommends that people-intensive uses, such as shopping malls and apartment complexes, be avoided in the APZs surrounding the airfield. A map of the APZs is available for review at the __________ office. If your property is located in an APZ, you need to check the local zoning ordinance to determine permitted uses. You also need to check certain mortgage requirements in APZs.

Would the development produce any flight hazards such as smoke, steam, or dust; include direct or reflected lighting; attract birds or other wildlife; create electromagnetic emissions; or exceed 120 feet in height?

☐ These types of development could endanger aircraft in the vicinity of Fort/Base/Air Station/Camp __________. If your property is located in the vicinity of the installation and would fall under any of the above, you need to check with the local zoning ordinance to determine permitted uses. Army representatives can also recommend design improvements to minimize flight hazards.
Sample Home buyer’s Checklist

Many neighbors of military installations experience, to a greater or lesser extent, the impacts of training noise. Property owners, renters, and lessees need to know whether their property is located within a military noise zone or Accident Potential Zone (APZ). While the installation encourages local government and realtors to provide notification about local installations and related noise, it may be necessary for you to collect your own information.

A checklist

- **Restrictive Easements**—Owners and potential buyers of property near the installation need to conduct a title search to verify any restrictive easements.

- **Noise Zones**—A map of the noise zones surrounding the installation is available for review at the ____________ office. If your property is located in a noise zone, you need to check local zoning ordinance to determine permitted uses. Some uses are permitted with appropriate sound attenuation measures. See the fact sheet titled “How does the DoD assess noise and its impacts?” for more information.

- **Accident Potential Zones**—Like noise zones, a map of installation APZs is available for review at the ____________ office. If your property is located in an APZ, you need to check local zoning ordinance to determine permitted uses. See the fact sheet titled “What are Accident Potential Zones?” for more information.

- **Questions concerning easements or the location of a particular property within a noise zone or APZ should be directed to a local planning authority. If you are considering property within a noise zone or APZ, you should check the eligibility requirements for Federal Housing Administration (FHA) and the Department of Veterans Affairs (VA) mortgages.**

For more information about mortgage requirements, contact:

U.S. Department of Housing and Urban Development
(800) 842-2610 ext. 3212

U.S. Department of Veterans Affairs
(800) 933-5499

For more information about the Army’s noise management program contact:

Operational Noise Program
U.S. Army Center for Health Promotion and Preventive Medicine
MCHB-TS-EON
Aberdeen Proving Ground, MD 21010-5403
410-436-3829

For more information on the Navy’s Noise Management Program contact:

Special Assistant for AICUZ and Enroachment
Commander Navy Installations
Naval Facilities Engineering Command
Washington Navy Yard, Washington DC 20374
202-685-9181
Sample Deed Statement

Military noise assessments and records include important information about noise impacts on the community, which should be used to educate prospective homebuyers. Disclosure of noise levels, for example, enables people to make more-informed choices regarding the location of homes, businesses, and public facilities. Optimally, for any new residential development or transfer of existing residences, ordinances should be in place to ensure that purchasers are aware of an installation’s noise environment in these areas.

A disclosure statement or notice should be included on the deed for the subject property and recorded by the county. It should also be included on any parcel map, tentative map, or final map for the subdivision approval.

Sample Deed

“This property is in the area subject to impacts from military operations. As a result, residents may experience inconvenience, annoyance, etc. arising from the noise of operations. Residents of property near a military facility should be aware of this situation and be prepared to accept such inconvenience, annoyance, etc. from normal military operations. Any subsequent deed conveying parcels or lots shall contain a statement of this form.”

Prospective homebuyers are further protected when:
- real estate and leasing agents are required to provide information about the potential noise problem,
- noise levels for the area are posted on “for sale” or “for lease” signs, and
- noise contours are published on subdivision plots and municipal, land use, and zoning maps.

By making this information public, incompatible uses around military installations may be prevented. Informed residents will be annoyed less by military noise, and developers and builders may be more discriminating when siting new construction.

For more information about the Army’s noise management program contact:

Operational Noise Program
U.S. Army Center for Health Promotion and Preventive Medicine
MCHB-TS-EN
Aberdeen Proving Ground, MD 21010-5403
410-436-3829
Sample Noise Easement

NOISE EASEMENT

Parcel ___________________________ County ________________

Grantor (s) Name ___________________________

Grantor (s) Address ______________________________________

LEGAL DESCRIPTION:

In accordance with section XXXX of the Land Use Code/Ordinance for XXXXX County, State of Kansas, approving a plat for residential development on the above described property, and in consideration of such approval, Grantors grant to the owners of all property adjacent to the above described property, a perpetual nonexclusive easement as follows:

1. The Grantors, their heirs, successors, and assigns acknowledge by the granting of this easement that the residential development is situated in an area that may be subjected to conditions resulting from military training at Fort Riley. Such conditions include the firing of small and large caliber weapons, the overflight of both fixed-wing and rotary-wing aircraft, the movement of vehicles, the use of generators, and other accepted and customary military training activities. These activities ordinarily and necessarily produce noise, dust, smoke and other conditions that may conflict with Grantors’ use of Grantors’ property for residential purposes. Grantors hereby waive all common law rights to object to normal and necessary military training activities legally conducted on adjacent Fort Riley, which may conflict with Grantors’ use of Grantors’ property for residential and other purposes, and Grantors hereby grant an easement to the adjacent Fort Riley for such activities.

2. Nothing in this easement shall grant a right to Fort Riley for ingress or egress upon or across the described property. Nothing in this easement shall prohibit or otherwise restrict the Grantors from enforcing or seeking enforcement of statutes or regulations of governmental agencies for activities conducted on adjacent properties.

3. This easement is appurtenant to all property adjacent to the above described property and shall bind to the heirs, successors, and assigns of Grantors and shall endure for the benefit of the adjoining Fort Riley. Fort Riley is hereby expressly granted the right of third party enforcement of the easement.

IN WITNESS WHEREOF, the Grantors have executed this easement dated this ________________ day of ______________________, 20 _____

Grantor
APPENDIX F: WORKS CITED


Department of the Army (2004). Draft Environmental Assessment for the Adoption of the Long Range Component of the Fort A.P. Hill Master Plan.


Fort A.P. Hill (2006). GUIDELINES FOR CONSIDERING NOISE IN LAND USE PLANNING AND CONTROL. Received via email on March 9, 2006.


King George County (2005) King George County Draft Comprehensive Plan Update to the 2000 Plan.


Stafford County (2003). Stafford County, Virginia Land Use Plan. Retrieved February 1, 2006 from Stafford County’s website: www.co.stafford.va.us


Virginia Department of Game and Inland Fisheries (2004). Lands End Wildlife Management Area. Retrieved February 27, 2006 from Department of Game and Inland Fisheries (DGIF) Website: http://www.dgif.state.va.us/wildlife/vbwt/site.asp?trail=1&site=CNN03&loop=CNN


Weldon Cooper Center (2006). Demographics and Workforce section. Retrieved February 13th, 2006, from the Weldon Cooper Center Website: www.coopercenter.org