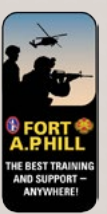


# Fort A.P. Hill Joint Land Use Study

FINAL December 2014



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## Acronyms and Initialisms

Acronyms / Initialisms	Definition
ACUB	Army Compatible Use Buffer
ADNL	A-Weighted Day-Night Level
AGL	Above Ground Level
AICUZ	Air Installation Compatible Use Zone
ALZ	Assault Landing Zone
APZ	Accident Potential Zone
AQCR	Air Quality Control Region
AR	Army Regulation
AT/FP	Anti-Terrorism/Force Protection
AWG	Asymmetric Warfare Group
BRAC	Base Realignment and Closure
CDNL	C-Weighted Day-Night Level
CERDEC NVESD	Communications-Electronics Research, Development and Engineering Center, Night Vision and Electronics Sensors Directorate
dB	Decibel
dBp	Peak Decibels
DCR	Virginia Department of Conservation and Recreation
DEQ	Virginia Department of Environmental Quality
DGIF	Department of Game and Inland Fisheries
DoD	Department of Defense
DoDI	Department of Defense Instruction
DPTMS	Department of Plans, Training, Mobilization and Security
DU	Dwelling Unit
DZ	Drop Zone
EA	Environmental Assessment
EIS	Environmental Impact Statement
EO	Executive Order
EOD	Explosive Ordnance Disposal
EPA	Environmental Protection Agency
ETA	Estimated Time of Arrival
EUL	Enhanced Use Lease
FAA	Federal Aviation Administration
FAMPO	Fredericksburg Area Metropolitan Planning Organization
FONSI	Finding of No Significant Impact
GS	General Schedule
GWRC	George Washington Regional Commission
GWCP	Ground Water Characterization Program
ICC	Installation Command Council
I-95	Interstate 95
INRMP	Integrated Natural Resources Management Plan
JLUS	Joint Land Use Study

## Acronyms and Initialisms (continued)

Acronyms / Initialisms	Definition
LTC	Lieutenant Colonel
LUPZ	Land Use Planning Zone
LRC	Long Range Component
L RTP	Long Range Transportation Plan
MCB	Marine Corps Base
MCLC	Mine Clearing Line Charge
MOA	Military Operations Area
MOU	Memorandum of Understanding
MSA	Metropolitan Statistical Area
NEPA	National Environmental Policy Act
NETCOM	Network Enterprise Technology Command
NLR	Noise Level Reduction
NOTAM	Notice to Airmen
NSWG 2	Naval Special Warfare Group 2
NVG	Night Vision Goggles
OEA	Office of Economic Adjustment
OMB	Office of Management and Budget
ONMP	Operational Noise Management Plan
ONP	Operational Noise Program
PAO	Public Affairs Office
PDC	Planning District Commission
PDR	Purchase of Development Rights
PD	Planned Development
REC	Rappahannock Electric Cooperative
REPI	Readiness and Environmental Protection Initiative
ROM	Rough Order of Magnitude
RPMP	Real Property Master Plan
TDR	Transfer of Development Rights
TIF	Tax Increment Financing
TND	Traditional Neighborhood Design
TRI	Toxics Release Inventory
UAS	Unmanned Aerial Systems
UAV	Unmanned Aerial Vehicles
USAPHC	United States Army Public Health Command
USFWS	United States Fish and Wildlife Service
VDOT	Virginia Department of Transportation
VFR	Visual Flight Rules
VMAC	Virginia Military Affairs Council
VRE	Virginia Railway Express
WMA	Wildlife Management Area

## **1.0 Introduction**

### **1.1 Study Purpose**

The Counties of Caroline, Essex, King George and Spotsylvania and the Towns of Bowling Green and Port Royal, localities which are impacted to the greatest extent by the operations at Fort A.P. Hill, have partnered with the U.S. Army to conduct this Joint Land Use Study (JLUS). The study is sponsored by the Town of Bowling Green and administered by the Office of Economic Adjustment (OEA) within the Department of Defense (DoD).

Fort A.P. Hill is not a typical military installation in that operations at the installation generate noise, smoke, or vibrations that may affect residents in its neighboring communities, thereby generating occasional complaints about operations. The communities generally accept these inconveniences, recognizing the important role of the facility and the infrequency of complaint-generating operations. Each community participating in this study strongly supports the military, the missions performed at Fort A.P. Hill, as well as the expansion of missions at Fort A.P. Hill that are planned and coordinated with the input of the communities. Therefore, the communities and the Army have agreed to participate in this study to identify and evaluate issues of mutual concern and work together to address the concerns that have been identified through this study.

The primary purpose of the study is to formalize an ongoing communication process that will ensure that issues related to military operations and growth in the area are given full consideration and discussion by all parties directly concerned. Attracting development within the towns and designated growth areas is a priority for the communities in order to improve local economic conditions, to efficiently provide public infrastructure and services, and to increase the local tax base. The Towns of Bowling Green and Port Royal need growth, both within and adjacent to their boundaries in order to be economically viable, and their importance is reflected as the centers of defined growth in Caroline County. Growth will likely result in additional population moving into the area, thereby generating the need for additional housing, schools, infrastructure, community services as well as creating new jobs. The new growth could also support existing and future residents and personnel working and training at Fort A.P. Hill. However, as more people move to the area and live and work in proximity to noise and operational impacts generated by the military, there are increased risks of complaints and potentially pressure on the military to modify operations which could, over time, compromise overall mission viability. These issues are central to the JLUS, further emphasizing the need for increased communication and dialogue.

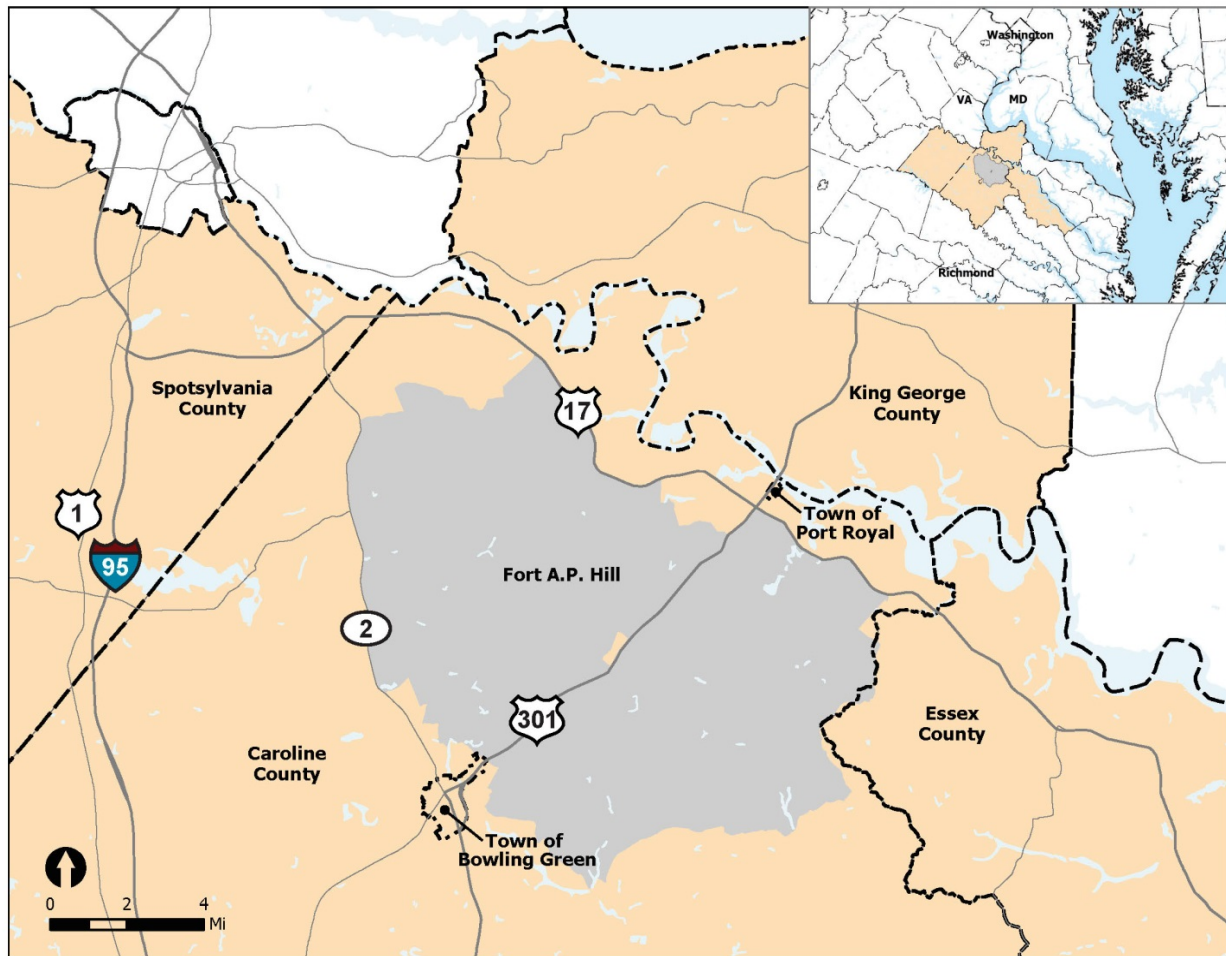
### **1.2 Methodology**

This document and the process and methodology for the planning effort were designed to meet the unique needs and interests of the JLUS partners. This document dedicates a chapter to each participating entity. The information included and issues, opportunities, and recommendations identified in each chapter are the expressed opinion of each respective entity and are not intended to imply consensus across all partners. Recommendations are advisory in nature and are not legally binding. It is the right of each JLUS partner to consider and implement the recommendations as desired, within the limits of their jurisdictional area.

### **1.3 Study Area**

The study area and its constituent communities (Figure 1.1) are considered to be part of the Fredericksburg region. Fort A.P. Hill is located in northeastern Caroline County, approximately 60 miles south of Washington, D.C. and 40 miles north of Richmond. Interstate 95 (I-95) traverses the study area seven miles west of Fort A.P. Hill, providing the area with easy access to Northern Virginia, Washington D.C., and Richmond. Northern Virginia's growth has





**Figure 1.1** Joint Land Use Study Partner Jurisdictions

pushed south along the I-95 corridor, contributing to strong population and employment growth in Spotsylvania County, western Caroline County, and the villages of King George and Dahlgren in King George County. The rest of the area has experienced modest levels of growth which contributes to a rural character reflective of small towns, agricultural and forest uses, and rural development patterns.

Fort A. P. Hill is bordered by U.S. Route 2 to the west and U.S. Route 17 to the north-east, and is divided by U.S. Route 301. Established in 1941, Fort A.P. Hill is one of the largest East Coast installations with 76,000 acres of land, which includes thirty-one training and maneuver areas for year-round training and a 27,000-acre range complex. The installation is a premier training destination that serves every component of the U.S Armed Forces, active and reserve, as well as several agencies of the U.S. government, and has trained more than 90,000 troops annually.



## **1.4 Project Leadership and Community Engagement**

The JLUS was overseen by both a Policy and Working Committee that together included representatives appointed by the governing body of each jurisdiction; a representative from the Commonwealth of Virginia's Governor's Office; and representatives from Fort. A.P. Hill selected by the installation's Garrison Commander. The role of each committee is described below.

### **Policy Committee**

The Policy Committee included elected officials from each JLUS community, the Fort A.P. Hill Garrison Commander and the regional military liaison appointed by the Commonwealth of Virginia's Secretary of Veteran Affairs and Homeland Security. The committee provided overall direction to the planning process.

### **Working Committee**

The Working Committee included technical representatives from each jurisdiction's planning department, administration or elected governing body, military installation planners from Fort A.P. Hill and the Policy Committee representative from the Virginia Secretary of Veteran Affairs and Homeland Security.

### **Community Outreach**

Public meetings were held in three different locations near the installation to introduce the project and solicit input. A project webpage was also established to disseminate information ([www.visitcaroline.com/fortaphilljlus](http://www.visitcaroline.com/fortaphilljlus)) and a project email address was created for receiving comments on the JLUS.

In addition, twenty-five stakeholder interviews were conducted with over 70 individual stakeholders to identify issues affecting Fort A.P. Hill and the local communities adjacent to the installation. These interviews also included briefings by Fort A.P. Hill operations personnel and tenants, and a tour of the installation ranges, airfields, training facilities, and administrative and community support areas. A wide variety of topics were discussed during the interviews.

## **1.5 Report Organization**

The JLUS is organized into eight chapters as follows:

1. Introduction
2. Town of Bowling Green
3. Town of Port Royal
4. Caroline County
5. Essex County
6. King George County
7. Spotsylvania County
8. Fort A.P. Hill

Chapters 2-7 include a similar format for each of the six jurisdictions participating in the study with each section including the following:

- Information on the respective community's population, demographics and history;
- Current planning tools and programs adopted by the community relevant to Fort A.P. Hill, if any;

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- Community issues and opportunities with current military operations at Fort A.P. Hill; and
- Recommendations on future collaboration.

Chapter 8 focuses on Fort A.P. Hill and documents existing military operations at the installation, programs, and tools to minimize impacts on the surrounding communities, and recommendations on future collaboration.

The information included in these chapters helps communicate concerns among all parties and suggests ways to improve the quality of life for local residents, as well as protect the important missions at Fort A.P. Hill that support our national defense.

**The parties involved in the Fort A.P. Hill Joint Land Use Study independently authored their respective chapters. Therefore, the thoughts, ideas, and recommendations in one chapter are the expressed views of a single entity, and do not imply consensus or endorsement among all JLUS partners.**

## **2.0 Town of Bowling Green**

### **2.1 Community Profile**

The Town of Bowling Green is located in the central part of Caroline County, approximately 45 miles north of Richmond and 20 miles south of Fredericksburg. The town shares its northeastern border with Fort A.P. Hill near U.S. Route 301 but is otherwise surrounded by Caroline County. The Town of Bowling Green's dominant feature is its Main Street with historic structures and walkable environment. The town is approximately 1.6 square miles or 1,017 acres.

Access into the town is provided by U.S. Route 301 and State Routes 2 and 207. The town's location along U.S. 301 (an alternate route to Interstate 95) affords it a direct connection into the Washington D.C. metropolitan area. Development within the town includes a central business district with commercial land uses along Route 2, Business Route 207, Route 301 and Business Route 301 (Broadus Avenue), as well as residential uses throughout the town. The town is a designated primary growth area of Caroline County and is therefore a focus area for future development based on the presence of and proximity to existing transportation, utility services, and other public infrastructure that supports residential, commercial and employment development. The town has several properties listed on the National Register of Historic Places and the Virginia Landmarks Register. In 2003, a portion of the town was designated as a historic district on the National Register of Historic Places and the Virginia Landmarks Register.

According to the U.S. Census Bureau, the town has grown over the past several decades and is anticipated to continue growing. The town's population was 1,111 in 2010<sup>1</sup> which represents approximately four percent of Caroline County's total 2010 population of 28,545 persons<sup>2</sup>. The Town of Bowling Green – Milford area is designated as a primary growth area by Caroline County and an economic center for the county.

### **2.2 Current Tools and Programs**

#### **2.2.1 Comprehensive Plan and Future Land Use**

The Town of Bowling Green adopted a Comprehensive Plan update in August 2008 and is currently in the process of updating the plan again. The 2008 plan seeks to create a framework for accommodating future population growth within Bowling Green while maintaining a small town atmosphere. The future land use plan identifies what types of development are appropriate for certain areas with the intent to provide the right balance of residential and commercial uses and infrastructure to allow the town to grow, enhance the town's tax base to support future community needs, and maintain a high quality of life.

The Comprehensive Plan identifies three primary development areas including the Broadus Avenue commercial corridor, the Downtown Commercial District, and the Route 301 North Corridor Area. These areas include existing commercial development and vacant lands and present opportunities for new commercial and residential redevelopment based on proximity to infrastructure support services such as utilities and arterial access. Land closest to Fort A.P. Hill along U.S. Route 301 is designated for commercial and residential land uses.

The Town of Bowling Green is committed to meeting the needs of citizens through thoughtful redevelopment and managed growth and to provide increased opportunities for retail and other services that are currently not

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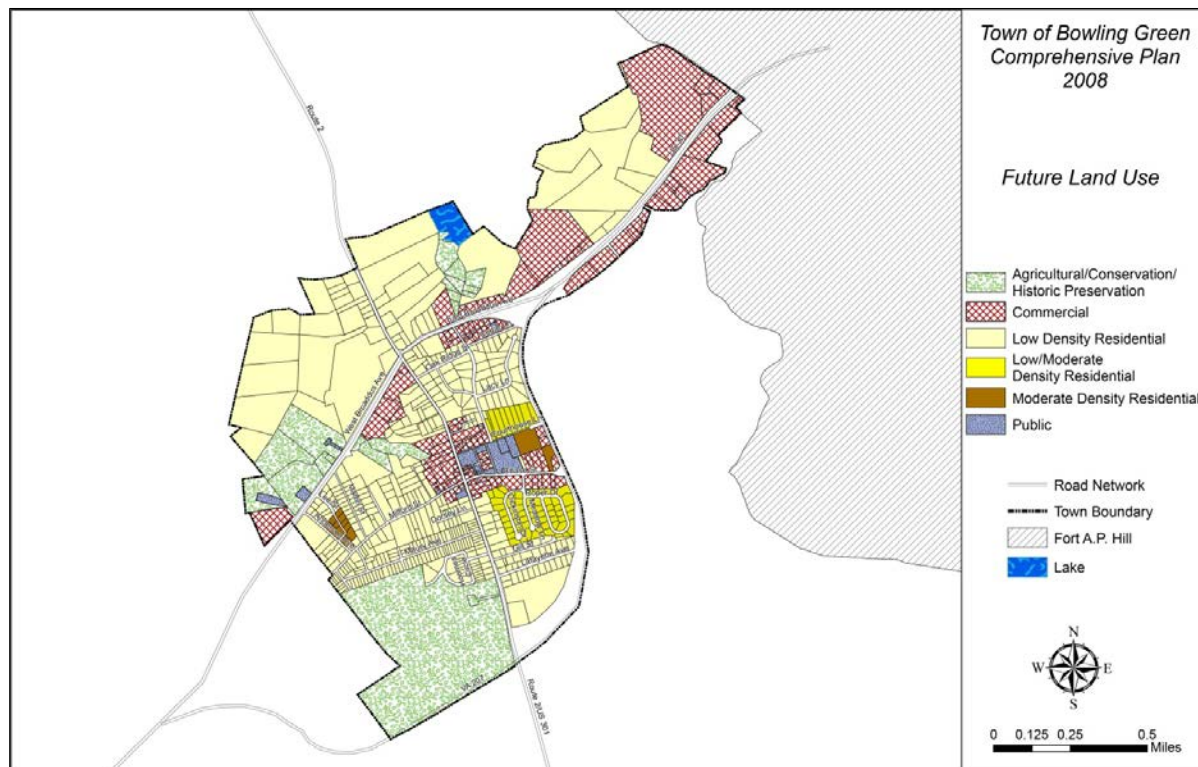
<sup>1</sup> U.S. Census, 2010.

<sup>2</sup> Ibid.

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immediately available nearby. Increased amenities such as food services, hotel, and retail uses would support residents living nearby as well as personnel training and working at Fort A.P. Hill, and would support the town's economic growth goals.

The plan highlights the importance of coordinating development plans with Caroline County and Fort A.P. Hill. Fort A.P. Hill is recognized as an important neighbor and the plan calls for notifying "the Commander, Fort A.P. Hill and his staff of any proposed development, rezoning requests, and other actions within 3,000 feet of the installation boundary."<sup>3</sup> Currently, the town coordinates review with Fort A.P. Hill on site plans, building permits, subdivision plans, and re-zonings and periodically meets with the installation to discuss development-related activities.



**Figure 2.1** Town of Bowling Green Future Land Use  
Source: Town of Bowling Green, 2008

### 2.2.2 Infrastructure Plans

The Town of Bowling Green relies on groundwater and deep wells for drinking water supply. The town provides water and sewer service to its residents and some adjacent Caroline County residents. The town has extended water lines east to U.S. 301, north along U.S. 301 to the Fort A.P. Hill boundary, north along the Route 2 corridor to Route 631, south to the White Meadows and Maury Heights Subdivisions, and east of the town to Chase Street, across U.S. 301.<sup>4</sup> The town also operates a waste water treatment system that serves the town and provides

<sup>3</sup> Town of Bowling Green, Virginia, Comprehensive Plan, Adopted on August 7, 2008.

<sup>4</sup> Caroline County, Virginia, Bowling Green-Millford Community Plan, September 2006; Town of Bowling Green Town Manager, November 2014.

service and capacity to a portion of Caroline County per a services agreement. The town's system extends along the U.S. 301 south corridor to two schools, the Community Services Center, and residential developments.<sup>5</sup>

## 2.3 Challenges and Opportunities

### 2.3.1 Challenges

- **Aircraft Training Routes Overlap with Some Town Investment Priorities.** The Town of Bowling Green has identified growth areas and provided infrastructure upgrades along the U.S. Route 301 corridor that are located in very close proximity to Fort A.P. Hill. Water and sewer line extensions have prepared this area for private development investment. The southern approach fan for the Assault Landing Zone (ALZ) covers a portion of the town's growth area (see Chapter 8.0, Fort A.P. Hill). The fans were developed by Fort A.P. Hill in absence of official noise contours since the number of flights is not high enough to warrant contours. The outer fan represents flight altitudes between 1,700 and 3,500 feet Above Ground Level (AGL) and noise levels below 80 decibels (dBA). While average noise levels in the fan areas are anticipated to be below typical airfields, there is a potential for individual overflights to generate undesirable noise impacts on current residents and future development.
- **Aircraft Noise.** Fort A.P. Hill aircraft operations currently generate noise impacts on the Town of Bowling Green. Hill Field (formerly Army Airfield), a landing zone located near the installation's perimeter boundary along U.S. 301, is primarily used by rotary wing aircraft (though small prop planes also sometimes use the field) and there are multiple other landing areas on post. In addition, helicopter operations traveling in perimeter routes along the installation's boundary fly over the town and generate noise impacts.
- **Small Arms Noise.** Small arms training at direct-fire and indirect-fire ranges generates impulse noise that is heard in the town.
- **Large Weaponry and Demolition Noise.** Noise associated with large caliber weapons and low frequency sounds impact the town. This type of noise is expressed by C-weighted Day-Night Level (CDNL) noise contours on Fort A.P. Hill noise contour maps and in peak noise contours that measure single events (see Chapter 8.0, Fort A.P. Hill). Peak noise contours are used to represent individual noise events and the contours cover a large area. The 115 dBP contour covers approximately half of the town's geographic extent. The majority of noise complaints from the town between 1996 and 2012 (tracked by Fort A.P. Hill) are associated with large weapons and demolition at the Fort A.P. Hill ranges.
- **Vibration.** Airborne vibration associated with lower frequency operational noise such as explosives and large caliber weapons, and vibration from aircraft have been experienced by town residents which has caused damage to some homes. Structural shaking and window rattling complaints have been documented.
- **Air Pollution.** Fort A.P. Hill conducts prescribed burning in support of forest management activities on training lands. Controlled burns have caused smoke and dust impacts in the communities surrounding the installation, including the Town of Bowling Green. Concerns exist regarding the potential for localized health impacts from the smoke and pollutant emissions associated with the burns and potential release of harmful particulates. Similar concerns also exist with the detonation of explosives.

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<sup>5</sup> *ibid.*

- Water Supply and Quality.** The town and surrounding communities rely upon groundwater for drinking water supply. Concerns exist about whether toxic releases from operations at Fort A.P. Hill could affect groundwater today or in the future. The Virginia Department of Environmental Quality (DEQ) publishes the Virginia Toxics Release Inventory (TRI) Report, pursuant to Virginia Code § 10.1-1186.1 on an annual basis. Quantities of released toxins are broken into a number of categories including releases to air, releases to water, and releases to land. In addition, the report documents transfers of chemicals off-site, on-site waste treatment and source reduction and recycling activities. According to the reports, between 2010 and 2011 between four and five facilities reported toxic releases in Caroline County, including Fort A.P. Hill. As a whole, Caroline County's ranking in Virginia for pounds of on-site release has increased from 85 out of 100 in 2010 to 43 out of 96 in 2012. However, the County's ranking for pounds of on-site management has remained fairly stable with a ranking of 52 out of 100 in 2010 and 51 out of 96 in 2012. Fort A.P. Hill is the largest contributor of releases in the county and the amount of toxins released greatly varies from year to year. For example, according to the 2011 and 2012 reports, Fort A.P. Hill released a total of 94,573 pounds of nitroglycerin on site in 2011 and 29,763 pounds of nitroglycerin on site in 2012.<sup>6 7</sup> In addition, the installation ranked 291 out of 423 in Virginia in 2010 for pounds of on-site release but ranked 75 out of 416 for pounds of on-site release in 2012. The installation ranked 384 out of 423 for pounds of on-site management in 2010 but ranked 412 out of 416 in 2012.

The Virginia Department of Environmental Quality (DEQ), Office of Water Supply collaborates with other state and federal programs to support local water resources planning. A Ground Water Characterization Program (GWCP) was established by DEQ to protect Virginia's environment and promote the health and well-being of its citizens by collecting, evaluating, and interpreting technical information necessary to manage ground water resources of the Commonwealth.<sup>8</sup>

Concerns about toxic releases, water quality and supply are further amplified by potential oil and gas exploration activities, like hydraulic fracking, that may occur on private lands in the area. The fracking process is not yet strongly-regulated by the Commonwealth or by localities and any long-term impacts of fracking are not yet understood. These issues require further study to understand potential impacts and to identify approaches to help protect the long-term viability of local drinking water supplies.

- Limited Localized Economic Benefits.** Fort A.P. Hill is recognized as a valuable regional training center that offers a unique training environment. The nature of the training that occurs at the installation is unlike most installations in that the number of permanently stationed personnel is very low compared to the large number of transient personnel. The installation's direct and indirect economic impacts are have not been quantified for local communities. While Fort A.P. Hill is a major employer in Caroline County (as noted in the Caroline County 2030 Comprehensive Plan), the overall local economic impacts generated by Fort A.P. Hill are not well understood but are anticipated to be low based on the transient-focused training mission. Direct and indirect economic impacts were quantified at the state level for Virginia for fiscal year 2010 and addressed employment, visitors (for both training and recreational purposes), and expenditures associated with non-personnel related costs (see Chapter 8.0, Fort A.P. Hill).

<sup>6</sup> Virginia DEQ, 2011 Virginia Toxics Release Inventory Report, 2013. As described in the report, the Toxics Release Inventory contains reported information on the quantities of chemicals released and managed, not the public's exposure to, or risk from, the chemicals. Risk to human health by a chemical release depends on the toxicity of the chemical; how it disperses, reacts, or persists in the environment; the quantity, concentration and type of human exposure. Chemicals reported for the TRI Report are not weighted by their toxicity. Annual reports from DEQ are available from 2007 through 2012 and include detailed appendices inclusive of jurisdiction and facility rankings. The reports are available online at <http://www.deq.virginia.gov/Programs/Air/AirQualityPlanningEmissions/SARATitleIII/SARA313ToxicsReleaseInventory.aspx>.

<sup>7</sup> Virginia DEQ, 2012 Virginia Toxics Release Inventory Report, 2014.

<sup>8</sup> Virginia DEQ, Status of Virginia's Water Resources, A Report on Virginia's Water Resources Management Activities, 2012.

Regional-level economic impacts from the installation would provide a useful planning tool for local economic development initiatives. In addition, programs to facilitate access from the installation training and barracks areas to the town (i.e. a shuttle, transit service, or coordinated food delivery service) or the promotion of a “buy local” program could further support local businesses.

- **Lack of Permanent Personnel at Fort A.P. Hill.** In recent years, new missions have located at Fort A.P. Hill, including the Asymmetric Warfare Group (AWG) complex and the U.S. Army Explosive Ordnance Disposal (EOD) Field Training Activity. Recent new missions have not included the relocation of headquarter-level commands (i.e. AWG headquarters is located at Fort Meade, Maryland) that typically bring permanently-stationed personnel. An increase in permanently-stationed personnel could lead to an increase in economic activity in the town and surrounding communities and would support business development. The number of permanently stationed troops at Fort A.P. Hill is low and the average daily supported population varies greatly based on training activities (see Chapter 8.0, Fort A.P. Hill). Efforts to attract new missions could be improved by aligning Fort A.P. Hill with the Washington-Baltimore-Northern Virginia, DC-MD-VA-WV-PA locality pay area which includes Spotsylvania County, Stafford County, and the City of Fredericksburg. Currently, Fort A.P. Hill is part of the Richmond locality pay area. In addition, increasing the per diem rate for temporary duty personnel so that it aligns with the Stafford County per diem rate would also be beneficial.
- **Attracting Hotel Franchises.** Fort A.P. Hill has expressed a strong need for nearby lodging to support military transient personnel that come and train at Fort A.P. Hill. According to Fort A.P. Hill, a significant number of military personnel are reported to travel ½ hour or more to Fredericksburg and other areas to obtain lodging. The town would like to address this need. Obtaining private financing in today’s market is challenging for businesses, especially hoteliers when financing tools require guarantees such as hotel room nights. Without such guarantees, efforts to attract hoteliers to the town have been constrained.

### 2.3.2 Opportunities

- **Formalized Coordination.** An ongoing implementation body or committee that meets on a regular basis to share information on mission or community land use changes, monitor implementation progress, and revisit longer-term strategies can be an effective mechanism for collaboration. For example, a Memorandum of Understanding (MOU), when pursued in conjunction with an implementation body, can address protocols for communication and information exchange.
- **Town and Fort Growth.** Additional business, like restaurants and hotels, offices, and support services would increase the town’s revenue and would provide additional amenities to those living in the area and coming to train – including any future missions. The town desires a better understanding of Fort A.P. Hill’s base service and retail needs (housing, convenience, food, dry cleaners, etc.) and would like to work with Fort A.P. Hill to identify ready locations within the town boundary to address these needs. Vacant land zoned to support growth exists on Main Street, Milford/Chase Street, East and West Broadus Avenue, and along the U.S. 301 corridor in close proximity to Fort A.P. Hill.
- **Reduce Noise Impacts through Land Use Process.** Proffered commitments to address noise attenuation, lighting, and/or other measures as part of rezoning applications, subdivision approvals for new development, or subdivision regulations could raise awareness about nearby military operations and help reduce noise impacts on future residents. In addition, a noise disclosure statement at a property point of sale or lease agreement may make buyers and renters more directly aware of potential impacts. The town already requires subdivision plats to recognize proximity to Fort A.P. Hill. However, further study is required to confirm the



costs and benefits of requiring sound attention, including any required steps with the Virginia Legislature to amend the State Code.

- **Reduce Noise Impacts through a Modification of Aircraft Operations.** Fort A.P. Hill currently observes unofficial courtesy flight avoidance areas over the Towns of Bowling Green and Port Royal and informs pilots of these areas during in-briefings to avoid these inhabited areas. However, according to comments received during the JLUS process, flights over these areas do occur and enforcement of the avoidance areas is a recognized challenge by Fort A.P. Hill. An official “no fly” zone over the town would help minimize noise impacts from all (installation and non-installation) aircraft activity on current and future residents. However, according to Fort A.P. Hill representatives, an official no fly zone would have to be established by the Federal Aviation Administration (FAA), not Fort A.P. Hill.
- **Contain Noise from Future Missions to Inside Installation Boundaries.** Current noise levels at Fort A.P. Hill extend into the surrounding communities. Future noise impacts on the community could be significantly reduced by ensuring that any new noise-generating mission keeps all noise impacts and noise contours within the installation boundaries. In addition, an official Fort A.P. Hill “no Mine Clearing Line Charge (MCLIC) policy” or net explosive weight limitation could provide increased assurance against future noise issues and complaints associated with large weapons and demolition activities.
- **Coordinated Development Reviews.** The Town of Bowling Green and Fort A.P. Hill coordinate on development reviews. For example, the town provides the installation an opportunity to comment on proposed subdivision plans, building permits, site plans, and re-zonings. Continued open dialogue and increased coordination will help develop mutually beneficial outcomes for the town and Fort A.P. Hill.
- **Utility Extensions.** Natural gas service would benefit Fort A.P. Hill, the Town of Bowling Green, and would help support development activities in the town and Caroline County. Domestic natural gas is a cleaner burning fuel than coal or oil, is cost competitive against other commodities, and contributes to energy security goals set forth by the Department of Defense. Efforts to expand natural gas service in the area are underway, including construction of a natural gas pipeline from Carmel Church to Milford that could be immediately capitalized on to extend the natural gas directly into the Town of Bowling Green. In addition, right of way along U.S. 301 would provide a possible route to extend water service to identified growth areas in the county. Extension of water along this corridor would provide a reliable source of water for existing developed areas and could provide a redundant water supply for Fort A.P. Hill. Collaboration among Fort A.P. Hill, the Towns of Bowling Green and Port Royal, and Caroline County could provide multiple benefits for all parties.

## 2.4 Recommendations

Based on feedback received from the Town of Bowling Green, this section establishes a set of recommended actions for the town to consider that could strengthen coordination between the town and Fort A.P. Hill. The recommendations are organized into the categories described below.

- **Coordination** – to facilitate coordination between Bowling Green and Fort A.P. Hill.
- **Communication** - to improve the dissemination of locality and military operational information.
- **Economic Development** - to foster economic development opportunities in Bowling Green.
- **Utilities** – to evaluate opportunities to expand utility services.
- **Community Development and Planning**- to reduce noise and vibration impacts on residents.

Each recommendation includes action steps, a timeframe, rough order magnitude of costs and staffing requirements.

- **Timeframe.** Identifies when the proposed recommendation should be initiated using one of four timeframe categories:
  - **Immediate (highest priority)** Now
  - **Short-term (high priority)** Less than one year
  - **Mid-term (moderate priority)** Between one and four years
  - **Long-term (lower priority)** More than four years
- **Order of Magnitude Cost.** Provides a high level, Rough Order-of-Magnitude (ROM) cost impact for local jurisdictions and Fort A.P. Hill to implement the strategy. Costs do not consider efforts undertaken by other parties beyond the JLUS partners.
  - **\$** = < \$100,000
  - **\$\$** = \$100,000 - \$300,000
  - **\$\$\$** = > \$300,000
- **Potential Staffing Requirements.** Provides an estimate of the potential required staff involvement and staff time of local jurisdictions and/or Fort A.P. Hill to implement the recommendation. Staffing requirements do not include efforts conducted by other parties.
  - **L** = minimum
  - **M** = moderate
  - **H** = high

Table 2.1 Town of Bowling Green JLUS Recommendations

Recommendation			Action Steps	Timeframe	Cost	Staffing
Coordination	1.1	Through an executed MOU, as prepared by the Executive Steering Committee (ESC) consisting of an elected official from each jurisdiction and the Fort A.P. Hill Garrison Commander, develop a process to address community and installation issues on a regularly scheduled basis.	<ul style="list-style-type: none"><li>• Agree upon key communication procedures and identify primary internal points of contact.</li><li>• Sign the MOU.</li><li>• Develop agenda to address critical topics as identified by participants.</li><li>• Schedule meetings.</li></ul>	Immediate	-	-
	1.2	Continue to solicit input from Fort A.P. Hill as part of a technical review process on development related submittals and text amendments.	<ul style="list-style-type: none"><li>• Provide the opportunity for input from Fort A.P. Hill on all development-related proposals and text amendments and consider the input in decision-making processes.</li></ul>	Short-term	\$	M
	1.3	Participate in review of Fort A.P. Hill long-range plans for newly proposed missions and on-base facilities, recognizing mission-related operational security requirements exist.	<ul style="list-style-type: none"><li>• Local government representatives shall meet with Fort A.P. Hill representatives during the plan development process.</li></ul>	Short-term	\$	M
	1.4	Study the localized air quality impacts (area immediately surrounding the installation) associated with controlled burns at Fort A.P. Hill.	<ul style="list-style-type: none"><li>• Work with Fort A.P. Hill to define the study area extent and review installation procedures and protocols for burns.</li><li>• Pursue federal funding for study.</li><li>• Meet with Fort A.P. Hill to review findings.</li></ul>	Short-term	\$	M
	1.5	Study the potential impacts of Fort A.P. Hill hazardous and toxic waste releases on ground water supply and recharge areas and public drinking water systems.	<ul style="list-style-type: none"><li>• Contact VA DEQ to discuss concerns and potential state-level resources that could support a study.</li><li>• Pursue state and/or federal funding for study.</li></ul>	Short-term	\$	M
Communication	2.1	Issue Fire Warning Orders (through Caroline Alert and other media and social network venues) of training activities that are non-routine and have the potential to be louder than normal, as well as controlled burn activities, including the proposed time and duration of aviation and ordnance operations.	<ul style="list-style-type: none"><li>• Fort A.P. Hill Public Affairs Officer (PAO) to define multiple media and social network outlets for alerts, including ESC and Installation Command Council (ICC).</li><li>• Develop template for alerts defining information elements.</li><li>• Localities to include warnings on websites and social media venues.</li><li>• Seek feedback on effectiveness of alerts from localities and public (during surveys or other planning processes).</li></ul>	Short-term	\$	M
	2.2	Support Fort A.P. Hill’s efforts to develop an outreach program to educate local citizens and electric utility providers about the impacts of lighting on Fort A.P. Hill operations.	<ul style="list-style-type: none"><li>• Fort A.P. Hill and localities coordinate to produce outreach materials, illustrative examples and guidelines on ways to reduce lighting impacts.</li><li>• Coordinate with utility providers.</li><li>• Post materials on websites.</li><li>• Hold public lighting workshops to inform citizens and utility providers about minimization techniques.</li></ul>	Mid-term	\$\$	M

Recommendation			Action Steps	Timeframe	Cost	Staffing
	2.3	Update locality website to recognize Fort A.P. Hill, its mission, its location, links to the Fort A.P. Hill web page, contact information for key personnel, and fire warning orders.	<ul style="list-style-type: none"> <li>Update community websites with links to key Fort A.P. Hill personnel contact information, fire warning orders, and noise reporting procedures.</li> </ul>	Mid-term	\$\$	M
Economic Development	3.1	Support the installation's pursuit of establishing Washington-Baltimore-Northern Virginia General Schedule (GS) pay grades for all personnel stationed at Fort A.P. Hill.	<ul style="list-style-type: none"> <li>Fort A.P. Hill to pursue pay grade issue with the U.S. Office of Management and Budget.</li> <li>Localities to write letters of support.</li> </ul>	Short-term	\$	M
	3.2	Support the installation's pursuit of increasing the per diem rate for temporary duty personnel so that it aligns with Stafford County per diem rate.	<ul style="list-style-type: none"> <li>Localities to write letters of support for Fort A. P. Hill per diem rate increase.</li> </ul>	Mid-term	\$	M
	3.3	Using manning/training personnel data from Fort A.P. Hill (updated on a bi-annual basis), pursue commercial and retail uses off base that support on base employees and local visitors, tourists and residents.	<ul style="list-style-type: none"> <li>Fort A.P. Hill to establish a recurring data collection process to document training personnel numbers of partner groups and rotational units.</li> <li>Provide data to ESC on bi-annual basis.</li> </ul>	Short-term	\$	M
	3.4	Ensure proper County and Town business licenses are in place for all construction activity at Fort A.P. Hill through improved oversight and accountability.	<ul style="list-style-type: none"> <li>Fort A.P. Hill to arrange meeting with Caroline County, Bowling Green, and Fort Belvoir / Army Corps of Engineers to discuss county and Town requirements.</li> </ul>	Short-term	\$	L
	3.5	Working with Caroline County, jointly study the economic impacts of conservation easements and non-taxable lands on municipal revenue streams.	<ul style="list-style-type: none"> <li>Prepare scope of work for study and pursue funding for study.</li> </ul>	Mid-term	\$	M
Utilities	4.1	Jointly study the feasibility and potential mechanisms for shared water supply and sewer utility services among Fort A.P. Hill, the Town of Port Royal, the Town of Bowling Green, and Caroline County.	<ul style="list-style-type: none"> <li>Localities to develop initial concept plans for water and sewer utilities for review with Fort A.P. Hill.</li> <li>Hold meeting with American Water to evaluate concept ideas and options for supporting shared use (land, etc.).</li> <li>Pursue funding for shared services study pending outcome.</li> </ul>	Immediate	\$\$	M
	4.2	Pursue natural gas service to serve Fort A.P. Hill and the Town of Bowling Green/Milford Primary Growth Area.	<ul style="list-style-type: none"> <li>Caroline County, Fort A.P. Hill, and Town of Bowling Green will coordinate with utility providers for provision of natural gas service from Milford.</li> <li>Pursue funding for pipeline extension project.</li> </ul>	Immediate	\$\$\$	M
	4.3	Work with Fort A.P. Hill, Town of Port Royal, and Caroline County to obtain utility rights of way along U.S. 301 that would allow for a major water distribution line from the Rappahannock River to the entire county.	<ul style="list-style-type: none"> <li>Localities to collaborate and define preferred right of way for water line.</li> <li>Meet with Fort A.P. Hill to discuss right of way concept.</li> <li>Encourage Fort A.P. Hill to define right of way in installation long-range plans to ensure preservation of corridor for utility purposes.</li> </ul>	Immediate	\$	M

Recommendation		Action Steps	Timeframe	Cost	Staffing
Community Development/ Planning	5.1	Support real estate disclosure for prospective buyers or renters as part of real estate transactions.	Mid-term	\$	M
		<ul style="list-style-type: none"> <li>• Incorporate statement on subdivision plats and site plans regarding proximity to Fort A.P. Hill and potential for noise.</li> <li>• Encourage Fredericksburg Area Association of Realtors (FAAR) to develop a basic disclosure statement and an amended point of sale document that includes disclosure.</li> <li>• Support FAAR in their pursuit of enabling legislation for noise disclosure.</li> </ul>			
	5.2	Encourage sound attenuation for new construction of residences, schools, hospitals, nursing homes, churches and other buildings with public gathering spaces.	Mid-term	\$	M
		<ul style="list-style-type: none"> <li>• Study the costs and benefits of sound attenuation and use outcome to determine if pursuit of State Code amendment is desired.</li> <li>• Utilize the proffer system or special use permit requirements to achieve higher sound attenuation standards.</li> <li>• Consider the development of model sound attenuation standards for new construction.</li> </ul>			
	5.3	Consider developing a model 'Dark Skies' Ordinance that sets forth specific requirements for lighting. Consider applying the ordinance county and town-wide for all 6 JLUS communities. Incorporate input from Fort A.P. Hill.	Mid-term	\$	M
		<ul style="list-style-type: none"> <li>• Localities to develop dark skies ordinance (using input from installation).</li> <li>• Incorporate lighting best practices into standard subdivision and plan review processes.</li> <li>• Provide information to utility providers regarding requirements.</li> </ul>			
	5.4	Develop a voluntary sound attenuation and lighting retrofit program for existing noise sensitive uses and high-demand lighting uses (such as sports complexes). Investigate federal or state funds to offset potential retrofit costs.	Long-term	\$	M
		<ul style="list-style-type: none"> <li>• ESC to jointly conduct a feasibility study for a residential sound and lighting retrofit program.</li> <li>• Identify potential retrofit candidates.</li> <li>• Research funding sources.</li> </ul>			
	5.5	Support the establishment of a "No Fly" Zone covering the Towns of Bowling Green and Port Royal and their designated growth areas and extending outward one mile from the boundary.	Short-term	\$	L
		<ul style="list-style-type: none"> <li>• Meet with Fort A.P. Hill to clarify air space restrictions and authorities.</li> <li>• Work with Fort A.P. Hill to formalize a no fly zone in operating regulations.</li> <li>• Meet with FAA to discuss options for a no fly area and modification of airspace restrictions.</li> </ul>			
	5.6	Work with Fort A.P. Hill to limit noise generated from future or expanded operations or missions at the installation to inside Fort A.P. Hill boundaries.	Mid-term	\$	L
		<ul style="list-style-type: none"> <li>• Participate in U.S. Army Environmental Impact Statements and Environmental Assessments that evaluate new mission impacts.</li> <li>• Discuss noise limitation concept with Fort A.P. Hill leadership.</li> </ul>			

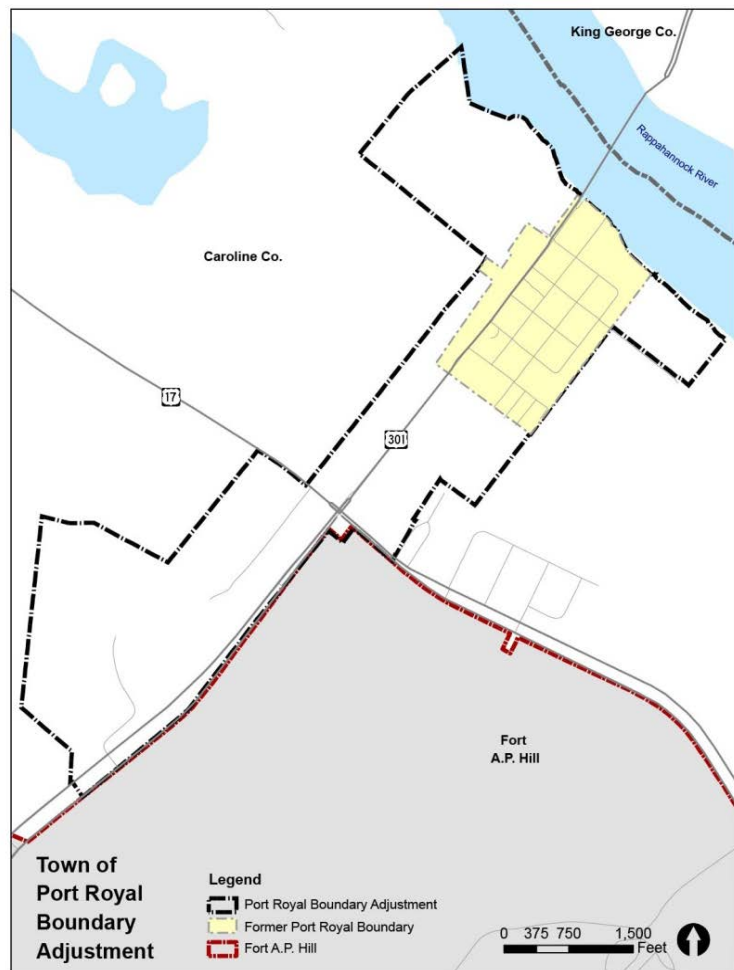
## 3.0 Town of Port Royal

### 3.1 Community Profile

The Town of Port Royal is approximately 60 miles north of Richmond and 30 miles southeast of Fredericksburg. The historic town (see Figure 3.1, former Port Royal Boundary area) is situated near the intersection of U.S. Routes 17 and 301 along the banks of the Rappahannock River. The Town of Port Royal has a very rich history dating back to the earliest days of colonial Virginia. First established on the Rappahannock River in 1652, the town became an important port for the export of tobacco and a center of commerce for the area. The town was chartered in 1744 and named for the Roy family, who owned a tobacco warehouse and operated a ferry across the river to King George County. The town is also notable for its Civil War era history, including an attack on the town in 1863. In April 1865, John Wilkes Booth arrived in Port Royal while fleeing following the assassination of President Lincoln. Booth was killed two miles outside of town on what was then the Garrett farm (now part of Fort A.P. Hill). The advent of the railroads saw a decline in shipping activity from the town in the mid-19<sup>th</sup> century, while the 20<sup>th</sup> century again brought activity to Port Royal as the crossroads of U.S. Routes 17 and 301.

Today, Port Royal contains many examples of its storied past, including a number of restored historic buildings, both public and private. The area established as the original 18<sup>th</sup> century town green today still serves a civic purpose as the location of the town hall and firehouse. The entire town and several individual structures are listed on the National Register of Historic Places and the Virginia Landmarks Register. Port Royal holds a number of events throughout the year to celebrate local history and provide activities for residents and guests.

In addition to its historic heritage, the town's relationship with Fort A.P. Hill is important to understand its current economic development potential. In 1940, in anticipation of American involvement in World War II, the Army began looking for large training areas outside of Washington, DC to train troops in maneuver, bivouacking and ordnance training. The Army located suitable property in northern Caroline County and via eminent domain, relocated families, businesses and churches and established the A.P. Hill Reservation as a training facility adjacent to the town in 1941. This training area was named after Lieutenant General Ambrose Powell Hill, a famous Confederate Commander during the Civil War, and first called Camp A.P. Hill. It was



**Figure 3.1** Town of Port Royal Boundary Adjustment

Source: Town of Port Royal, effective July 1, 2014

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subsequently re-designated as Fort A.P. Hill in 1977. The land purchased by the Federal government in the early 1940s was mostly rural but also contained family farms and residents who were paid to relocate to make room for the Army's extensive maneuver and ordnance training area. While some original buildings still remain on the installation, many schools, churches, stores and farm-related activities were relocated outside the installation boundaries. The original farm and river community setting in and around Port Royal was changed forever by the addition of this 76,000 acre Federal military complex immediately adjacent to the town. Citizens were forced to redesign their lives and futures in support of their country, a sacrifice that is noted and worthy of remembrance. Given its close proximity to Fort A.P. Hill, the town has now become increasingly dependent on activity related to the installation. Enhancing economic activity and commercial services to support the Army's trainees at the installation is an important aspect of the town's future growth potential and recognized in the recommendations contained in this chapter of the JLUS.

From a geographic perspective, the town is constrained in its ability to physically grow by the Rappahannock River to the northeast, conserved lands like the Rappahannock River Wildlife Refuge and easements (such as those secured through the Army's Compatible Use Buffer Program) to the east and southeast, and Fort A.P. Hill to the southwest. The town and undeveloped land areas immediately adjacent to the town boundaries have been identified by Caroline County as a growth area in the county's Comprehensive Plan. To assist the town in increasing revenue to support growth and development, a boundary line adjustment was proposed and subsequently passed by the Caroline County Board of Supervisors and became effective on July 1, 2014. This boundary revision increased the town's footprint into the growth area along the U.S. 301 corridor, as well as on lands bordering the river, as shown in Figure 3.1.

### 3.2 Current Tools and Programs

#### 3.2.1 Comprehensive Plan, Future Land Use, and Zoning

The Town of Port Royal's last comprehensive plan was published in 1988 and the recent boundary line adjustment will require updates to the town's Comprehensive Plan and Zoning Ordinance for the newly added land area. The town today is approximately 489 acres in size (including the new land area recently added) and includes a village core, institutional uses, residential development, rural preservation, and several commercial establishments along U.S. 301. Aside from the new land area, existing land uses and zoning within the town have not changed significantly since the plan was published (See Figure 3.2).



**Figure 3.2** Town of Port Royal Zoning

Source: Town of Port Royal, 2014



### 3.2.2 Infrastructure Plans

Because the town is not served by public sewer, residents and businesses rely upon on-site sewage disposal systems. This situation limits commercial development within the town since restaurants and hotels must have permitted and approved water and waste water facilities.

The Town of Port Royal maintains a public water system which utilizes two wells and a water tower to serve residents and businesses. The water tower and tank were built in the 1942 with help from Fort A.P. Hill. The wood tank was replaced with a steel tank in 1967; however, the tower and tank have now outlived their intended lifespan. The town has a two-phased plan to replace its aging water infrastructure. Phase I calls for replacing the tank and tower with enough capacity to meet future growth and improve fire protection. Phase II includes the replacement of aging water lines and the possible installation of a fire protection conveyance system. The town is currently reviewing implementation options for this infrastructure upgrade. In 2012 the town applied for a community development grant. Denial of the grant led to negotiations with Caroline County for a boundary line adjustment and on July 1, 2014 the boundary line adjustment was finalized. The town is currently reviewing options for water infrastructure, updating zoning and updating the comprehensive plan.

## 3.3 Challenges and Opportunities

### 3.3.1 Challenges

- **Large Weaponry and Demolition Noise.** Noise associated with large caliber weapons and low frequency sounds impacts the town. This type of noise is expressed by C-weighted Day-Night Level (CDNL) noise contours on Fort A.P. Hill noise contour maps and in peak noise contours that measure single events. Peak noise contours are used to represent individual noise events and the contours cover a large area. The 115 dBP contour covers the entire geographic extent of the town. In addition, the 57-62 CDNL contour (also referred to by the installation as a land use planning zone) covers the entire town and the 62-70 CDNL contour is located in very close proximity to the town's southern boundary. Noise complaints from the town between 1996 and 2012 (tracked by the installation) are associated with large weapons and demolition at the Fort A.P. Hill ranges. Mine Clearing Line Charges (MCLIC) have caused significant noise (and vibration) impacts in the past.
- **Vibration.** Airborne vibration associated with lower frequency operational noise such as explosives and large caliber weapons, and vibration from aircraft have been experienced by town residents which has caused damage to some homes. Structural shaking and window rattling complaints have been documented.
- **Small Arms Noise.** Small arms training at direct-fire and indirect-fire ranges generates impulse noise that is heard in the town.
- **Aircraft Noise.** Fort A.P. Hill aircraft operations currently generate noise impacts to the Town of Port Royal. The majority of aircraft noise impacts are associated with helicopter operations traveling in perimeter routes along the installation's boundary that fly over the town.
- **Air Pollution.** Fort A.P. Hill conducts prescribed burning in support of forest management activities on training lands. Controlled burns have caused smoke and dust impacts in the communities surrounding the installation, including the Town of Port Royal. Concerns exist regarding the potential for localized health impacts from the smoke and pollutant emissions associated with the burns and potential release of harmful particulates. Similar concerns also exist with the detonation of explosives.

- Water Supply and Quality.** The town and surrounding communities rely upon groundwater for drinking water supply. Concerns exist about whether toxic releases from operations at Fort A.P. Hill are or could affect groundwater today or in the future. The Virginia Department of Environmental Quality (DEQ) publishes the Virginia Toxics Release Inventory (TRI) Report, pursuant to Virginia Code § 10.1-1186.1 on an annual basis. Quantities of released toxins are broken into a number of categories including releases to air, releases to water, and releases to land. In addition, the report documents transfers of chemicals off-site, on-site waste treatment and source reduction and recycling activities. According to the reports, between 2010 and 2011 between four and five facilities reported toxic releases in Caroline County, including Fort A.P. Hill. As a whole, Caroline County's ranking in Virginia for pounds of on-site release has increased from 85 out of 100 in 2010 to 43 out of 96 in 2012. However, the County's ranking for pounds of on-site management has remained fairly stable with a ranking of 52 out of 100 in 2010 and 51 out of 96 in 2012. Fort A.P. Hill is the largest contributor of releases in the county and the amount of toxins released greatly varies from year to year. For example, according to the 2011 and 2012 reports, Fort A.P. Hill released a total of 94,573 pounds of nitroglycerin on site in 2011 and 29,763 pounds of nitroglycerin on site in 2012.<sup>1, 2</sup> In addition, the installation ranked 291 out of 423 in Virginia in 2010 for pounds of on-site release but ranked 75 out of 416 for pounds of on-site release in 2012. The installation ranked 384 out of 423 for pounds of on-site management in 2010 but ranked 412 out of 416 in 2012.
- Limited Localized Economic Benefits.** Fort A.P. Hill is recognized as a valuable regional training center that offers a unique training environment. The nature of the training that occurs at the installation is unlike most installations in that the number of permanently stationed personnel is very low compared to the large number of transient personnel. The installation's direct and indirect economic impacts have not been quantified for local communities. While the installation is a major employer in Caroline county (as noted in the Caroline County 2030 Comprehensive Plan), the overall local economic impacts generated by the installation are not well understood but are anticipated to be low based on the transient-focused training mission. Direct and indirect economic impacts were quantified at the state level for Virginia for fiscal year 2010 and addressed employment, visitors (for both training and recreational purposes), and expenditures associated with non-personnel related costs (see Chapter 8.0, Fort A.P. Hill).
- Lack of Permanent Personnel at Fort A.P. Hill.** In recent years, new missions have located at the installation, including the Asymmetric Warfare's Group (AWG) complex and the U.S. Army Explosive Ordnance Disposal (EOD) Field Training Activity. Recent new missions have not included the relocation of headquarter-level commands (i.e. AWG headquarters is located at Fort Meade, Maryland) that typically bring permanently-stationed personnel. An increase in permanently-stationed personnel could lead to an increase in economic activity in the town and surrounding communities and would support business development. The number of permanently stationed troops at Fort A.P. Hill is low and the average daily supported population varies greatly based on training activities (see Chapter 8.0, Fort A.P. Hill). Efforts to attract new missions could be improved by aligning Fort A.P. Hill with the Washington-Baltimore-Northern Virginia, DC-MD-VA-WV-PA locality pay area which includes Spotsylvania County, Stafford County, and the City of Fredericksburg. Currently, Fort A.P. Hill is part of the Richmond locality pay area. In addition, increasing the per diem rate for temporary duty personnel so that it aligns with the Stafford County per diem rate would also be beneficial.

<sup>1</sup> Virginia DEQ, 2011 Virginia Toxics Release Inventory Report, 2013. As described in the report, the Toxics Release Inventory contains reported information on the quantities of chemicals released and managed, not the public's exposure to, or risk from, the chemicals. Risk to human health by a chemical release depends on the toxicity of the chemical; how it disperses, reacts, or persists in the environment; the quantity, concentration and type of human exposure. Chemicals reported for the TRI Report are not weighted by their toxicity. Annual reports from DEQ are available from 2007 through 2012 and include detailed appendices inclusive of jurisdiction and facility rankings. The reports are available online at <http://www.deq.virginia.gov/Programs/Air/AirQualityPlanningEmissions/SARATitleIII/SARA313ToxicsReleaseInventory.aspx>.

<sup>2</sup> Virginia DEQ, 2012 Virginia Toxics Release Inventory Report, 2014.

### 3.3.2 Opportunities

- **Formalized Coordination.** An ongoing implementation body or committee that meets on a regular basis to share information on mission and community land use changes, monitor implementation progress, and revisit longer-term strategies can be an effective mechanism for collaboration. For example, a Memorandum of Understanding (MOU), when pursued in conjunction with an implementation body, can address protocols for communication and information exchange.
- **Town and Installation Growth.** Additional business, like restaurants and hotels, offices, and support services would increase the town's revenue and would provide additional amenities to those living in the area and coming to train – including any future missions. The town desires a better understanding of the installation's base service and retail needs (housing, convenience, food, dry cleaners, etc.) and would like to work with the installation to increase "trainees" contact with the town's business community.
- **Utility Extension.** The town is in need of public water system upgrades. The town's proximity to the installation's privatized water treatment system near Camp Cook could present opportunities to address the town's water/sewer supply needs but additional study is needed. Likewise, right of way along U.S. 301 could provide a possible route to extend water service from a proposed intake in the Rappahannock River to identified growth areas in the town and in other parts of Caroline County.
- **Reduce Noise Impacts through Modification to Aircraft Operations.** Fort A.P. Hill currently observes unofficial courtesy flight avoidance areas over the Towns of Bowling Green and Port Royal and informs pilots of these areas during in-briefings to avoid these inhabited areas. However, according to comments received during the JLUS process, flights over these areas do occur and enforcement of the avoidance areas is a recognized challenge by Fort A.P. Hill. An official "no fly" zone over the town would help minimize noise impacts from all (installation and non-installation) aircraft activity on current and future residents. However, according to Fort A.P. Hill representatives, an official no fly zone would have to be established by the Federal Aviation Administration (FAA), not Fort A.P. Hill.
- **Citizen Advocate on Base.** A dedicated citizen advocate at Fort A.P. Hill could provide more efficient responses to citizen complaints related to operations. An advocate could also help citizens navigate legal processes and points of contact internal to the installation and U.S. Army, if applicable, related to structure damage claims associated with operational impacts.
- **Contain Noise from Future Missions to Inside Installation Boundaries.** Current noise levels at Fort A.P. Hill extend into the surrounding communities. Future noise impacts on the community could be significantly reduced by ensuring that any new noise-generating mission keeps all noise impacts and noise contours within the installation boundaries. In addition, an official Fort A.P. Hill "no Mine Clearing Line Charges (MCLIC) policy" or net explosive weight limitation could provide increased assurance against future noise issues and complaints associated with large weapons and demolition activities.
- **Coordinated Development Reviews.** The town and the installation coordinate on various issues already related to development and infrastructure needs. Continued open dialogue and increased coordination on development reviews, such as adding a Fort A.P. Hill representative as a non-voting Planning Commission member, will help develop mutually beneficial outcomes for the town and the installation.

### 3.4 Recommendations

Based on feedback received from the Town of Port Royal, this section establishes a set of recommended actions for the town to consider that could strengthen coordination between the town and the installation. The recommendations are organized into the categories described below.

- **Coordination** – to facilitate coordination between the town and Fort A.P. Hill.
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- **Utilities** – to evaluate opportunities for improved broadband services around Fort A.P. Hill.
- **Community Development** - to reduce noise and vibration impacts on residents.

Each recommendation includes action steps, a timeframe, rough order magnitude of costs and staffing requirements.

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  - **Mid-term (moderate priority)** Between one and four years
  - **Long-term (lower priority)** More than four years
- **Order of Magnitude Cost.** Provides a high level, Rough Order-of-Magnitude (ROM) cost impact for local jurisdictions and the installation to implement the strategy. Costs do not consider efforts undertaken by other parties beyond the JLUS partners.
  - **\$** = < \$100,000
  - **\$\$** = \$100,000 - \$300,000
  - **\$\$\$** = > \$300,000
- **Potential Staffing Requirements.** Provides an estimate of the potential required staff involvement and staff time of local jurisdictions and/or Fort A.P. Hill to implement the recommendation. Staffing requirements do not include efforts conducted by other parties.
  - **L** = minimum
  - **M** = moderate
  - **H** = high

Table 3.1 Town of Port Royal JLUS Recommendations

Recommendation		Action Steps	Timeframe	Cost	Staffing
Coordination	1.1	<p>Through an executed MOU, work with the other JLUS partners to establish an Executive Steering Committee (ESC) including local elected officials and the Fort A.P. Hill Garrison Commander to discuss community, installation and other compatibility issues on a regular scheduled basis and to coordinate and collaborate on the following:</p> <ul style="list-style-type: none"> <li>• Capital improvement and infrastructure planning.</li> <li>• Comprehensive plan and other planning document updates.</li> <li>• Long-range planning for newly proposed missions and on-base facilities, recognizing mission-related operational security requirements exist.</li> <li>• Environmental studies related to air and water quality impacts.</li> <li>• Pursuit of funding for studies.</li> </ul> <p>The ESC should include a Working Committee at the planning director level that will form subcommittees as necessary to explore specific issues and opportunities.</p>	Immediate	-	-
	1.2	<p>Continue to solicit input from Fort A.P. Hill as part of a technical review process on development related submittals and text amendments.</p>	Short-term	\$	M
Communication	2.1	<p>Issue Fire Warning Orders (through Caroline Alert and other media and social network venues) of training activities that are non-routine and have the potential to be louder than normal, as well as controlled burn activities, including the proposed time and duration of aviation and ordnance operations.</p>	Short-term	\$	M

Recommendation			Action Steps	Timeframe	Cost	Staffing
	2.2	Re-structure and expand the ICC to include local businesses, residents, installation employees, non-profits, etc., to serve as a citizen group designed to promote positive community and installation relations and to help organize and sponsor events and activities and support economic development.	<ul style="list-style-type: none"><li>• ESC to evaluate ICC membership and redefine membership to accomplish intent of strategy</li><li>• Hold ICC meeting.</li><li>• Establish leadership and purpose of ICC and carry out activities.</li></ul>	Mid-term	\$	L
	2.3	Update locality website to recognize the installation, its mission, its location, links to the installation web page, contact information for key personnel, and fire warning orders.	<ul style="list-style-type: none"><li>• Update community websites with links to Fort A.P. Hill key personnel contact information, fire warning orders, and noise reporting procedures.</li></ul>	Mid-term	\$\$	M
Economic Development	3.1	Support the installation’s pursuit of establishing Washington-Baltimore-Northern Virginia General Schedule (GS) pay grades for all personnel stationed at Fort A.P. Hill.	<ul style="list-style-type: none"><li>• Fort A.P. Hill to pursue pay grade issue with the U.S. Office of Management and Budget.</li><li>• Localities to write letters of support.</li></ul>	Short-term	\$	M
	3.2	Support Fort A.P. Hill’s pursuit of increasing the per diem rate for temporary duty personnel so that it aligns with Stafford County per diem rate.	<ul style="list-style-type: none"><li>• Localities to write letters of support for Fort A.P. Hill per diem rate increase.</li></ul>	Mid-term	\$	M
	3.3	Using manning/training personnel data from the installation updated on a bi-annual basis, pursue commercial and retail uses off base that support on base employees and local visitors, tourists and residents.	<ul style="list-style-type: none"><li>• Fort A.P. Hill to establish a recurring data collection process to document training personnel numbers of partner groups and rotational units.</li><li>• Provide data to ESC on bi-annual basis.</li></ul>	Short-term	\$	M
	3.4	Establish the town as a possible economic growth district to attract new business and services supporting Fort A.P. Hill trainees, as well as town residents, visitors and tourists.	<ul style="list-style-type: none"><li>• Town of Port Royal to coordinate with installation representatives on town growth objectives and possible economic growth district.</li></ul>	Long-term	\$	M
Utilities	4.1	Jointly study the feasibility and potential mechanisms for shared water supply and sewer utility services around Fort A.P. Hill, as well as infrastructure within the Town of Port Royal.	<ul style="list-style-type: none"><li>• Localities to develop initial concept plans for water and sewer utilities for review with the installation.</li><li>• Hold meeting with American Water to evaluate concept ideas and installation options for supporting shared use (land, etc.).</li><li>• Pursue funding for shared services study pending outcome.</li></ul>	Mid-term	\$\$	M
	4.2	Work with Fort A.P. Hill, Town of Bowling Green, and Caroline County to obtain utility rights of way along U.S. 301 for a major water distribution line that will bring water from the Rappahannock River (a new source) to the entire county.	<ul style="list-style-type: none"><li>• Localities to collaborate and define preferred right of way for water line.</li><li>• Meet with Fort A.P. Hill to discuss right of way concept.</li><li>• Encourage Fort A.P. Hill to define right of way in installation long-range plans to ensure preservation of corridor for utility purposes.</li></ul>	Mid-term	\$	M

Recommendation			Action Steps	Timeframe	Cost	Staffing
	4.3	Coordinate extension of broadband / telecommunication services to better serve the communities around the installation.	<ul style="list-style-type: none"> <li>• Develop an ESC subcommittee to focus on broadband issues and to coordinate services.</li> </ul>	Long-term	\$	M
Community Development / Planning	5.1	Support real estate disclosure for prospective buyers or renters as part of real estate transactions.	<ul style="list-style-type: none"> <li>• Incorporate statement on subdivision plats regarding proximity to Fort A.P. Hill and potential for noise.</li> <li>• ESC to work with Fredericksburg Area Association of Realtors (FAAR) to develop a basic disclosure statement and an amended point of sale document that includes disclosure.</li> </ul>	Mid-term	\$	M
	5.2	Encourage sound attenuation for new construction of residences, schools, hospitals, nursing homes, churches and other buildings with public gathering spaces.	<ul style="list-style-type: none"> <li>• Study the costs and benefits of sound attenuation and use outcome to determine if pursuit of State Code amendment is desired.</li> <li>• Utilize the proffer system or special use permit requirements to achieve higher sound attenuation standards.</li> <li>• Consider the development of model sound attenuation recommendations for new construction.</li> </ul>	Mid-term	\$	M
	5.3	Consider developing a model 'Dark Skies' Ordinance that sets forth specific requirements for lighting. Consider applying the ordinance county and town-wide for all six JLUS communities. Incorporate input from Fort A.P. Hill.	<ul style="list-style-type: none"> <li>• Localities to develop dark skies ordinance (using input from the installation).</li> <li>• Incorporate lighting best practices into standard subdivision and plan review processes.</li> <li>• Provide information to utility providers regarding requirements.</li> </ul>	Mid-term	\$	M
	5.4	Develop a voluntary sound attenuation and lighting retrofit program for existing noise sensitive uses and high-demand lighting uses (such as sports complexes). Investigate federal or state funds to offset potential retrofit costs.	<ul style="list-style-type: none"> <li>• ESC to jointly conduct a feasibility study for a residential sound and lighting retrofit program.</li> <li>• Identify potential retrofit candidates</li> <li>• Research funding sources.</li> </ul>	Long-term	\$	M
	5.6	Support the establishment of a "No Fly" Zone covering the Town of Port Royal and extending outward one mile from the town boundary.	<ul style="list-style-type: none"> <li>• Meet with the installation to clarify air space restrictions and authorities.</li> <li>• Work with the installation to formalize a no fly zone in operating regulations</li> <li>• Meet with FAA to discuss options for a no fly area and modification of airspace restrictions.</li> </ul>	Mid-term	\$	L
	5.7	Limit noise generated from future operations or missions at Fort A.P. Hill to inside installation boundaries.	<ul style="list-style-type: none"> <li>• Participate in U.S. Army Environmental Impact Statements and Environmental Assessments that evaluate new mission impacts.</li> <li>• Discuss noise limitation concept with Fort A.P. Hill leadership.</li> </ul>	Mid-term		L



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## 4.0 Caroline County

### 4.1 Community Profile

Caroline County is approximately 35 miles north of Richmond and 75 miles south of Washington, D.C. Interstate 95 (I-95) runs through the western portion of Caroline County and the Rappahannock River forms the northern boundary of the county. Caroline County fully surrounds two incorporated towns – the Town of Bowling Green and the Town of Port Royal. The county's landscape is primarily rural and agricultural with rolling hills and forests. There are concentrated suburban areas along the I-95 corridor including Carmel Church and Ladysmith, as well as areas adjacent to the Towns of Bowling Green and Port Royal.

Fort A.P. Hill, which is entirely within Caroline County, occupies roughly one-fifth of Caroline County's 549 square miles. The majority of the land around Fort A.P. Hill is rural and agricultural. Residential development occurs throughout the area in planned subdivisions and individual or clusters lots. The largest concentration of development near the installation is southwest of the installation near the intersections of U.S. 301, and State Routes 207 and 2. This area constitutes the Bowling Green-Milford growth area and is discussed in more detail below.

### 4.2 Current Tools and Programs

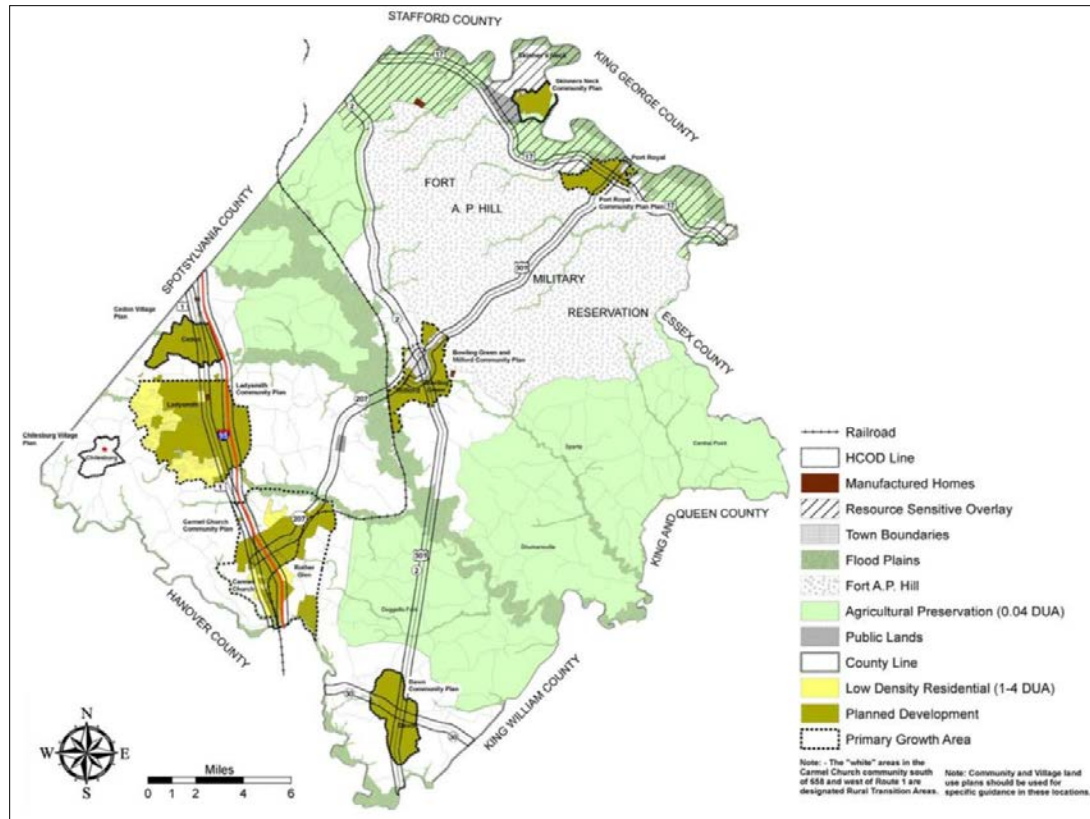
#### 4.2.1 Comprehensive Plan and Future Land Use Plan

The Caroline County 2030 Comprehensive Plan, which was last updated in 2010, identifies the County's long-range planning and growth management goals for the physical development of the County. Two of the guiding principles of the plan are to guide development into defined growth areas, and to preserve the unique rural and agricultural character of the county. The plan focuses development within defined growth areas and employment centers where infrastructure investments are available or planned, and defines land use designations and densities outside the growth areas that promote agricultural preservation, rural preservation and residential development. With the exception of the Bowling Green-Milford and Port Royal growth areas which abut Fort A.P. Hill, the majority of land abutting the installation's boundary is designated for rural or agricultural uses and is not expected to change significantly (See Figure 4.1).

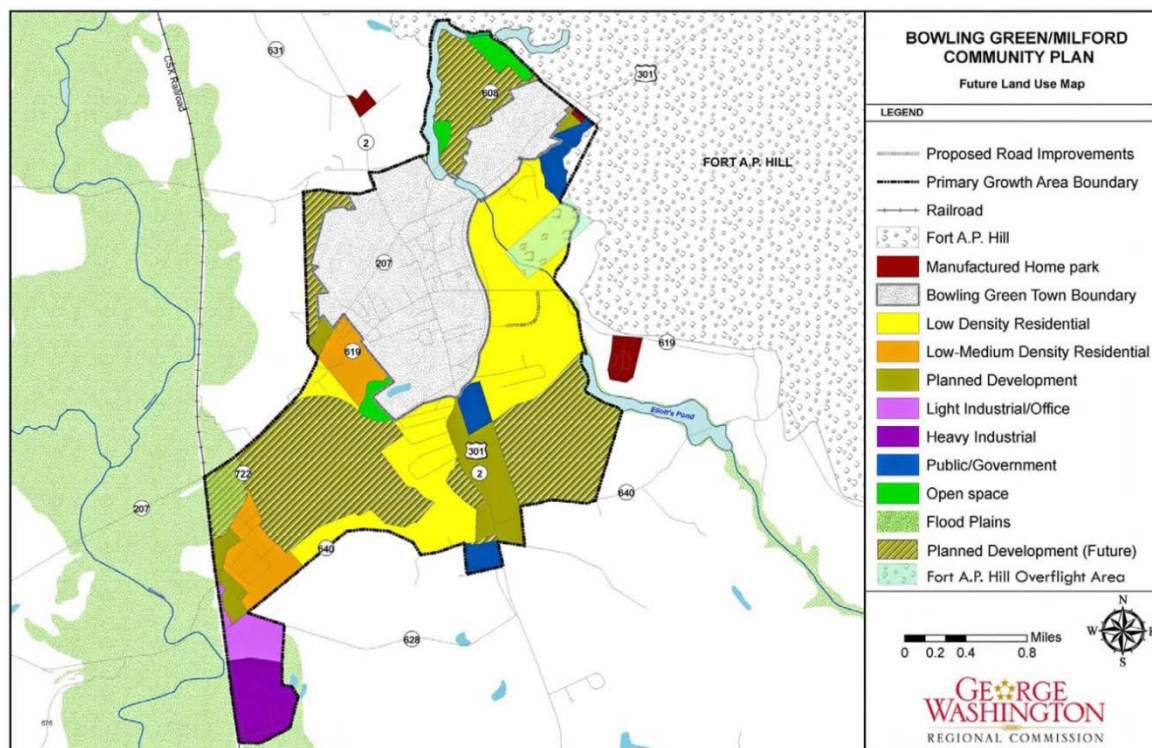
The Bowling Green-Milford growth area (See Figure 4.2) is located at the intersections of Route 2, 301 and 207 and is situated southwest of Fort A.P. Hill. In 2006 the county adopted the Bowling Green-Milford Community Plan which addresses land areas outside the Town of Bowling Green boundary. The plan recognizes the importance of the Town of Bowling Green as the economic center for the area. The Bowling Green-Milford plan designates the land between Route 2 and the installation for planned development, low density residential, and public/government uses. The planned development (PD) designation "allows the County the flexibility to adjust densities based upon the merits of the individual application. However, a PD does require that 50% of any residential area be preserved as open space. Only through a PD designation can a Traditional Neighborhood Design (TND) or 'mixed use' type of project be possible."<sup>1</sup> The county's planned development areas are adjacent to the Town of Bowling Green and support the town's future land use plan.

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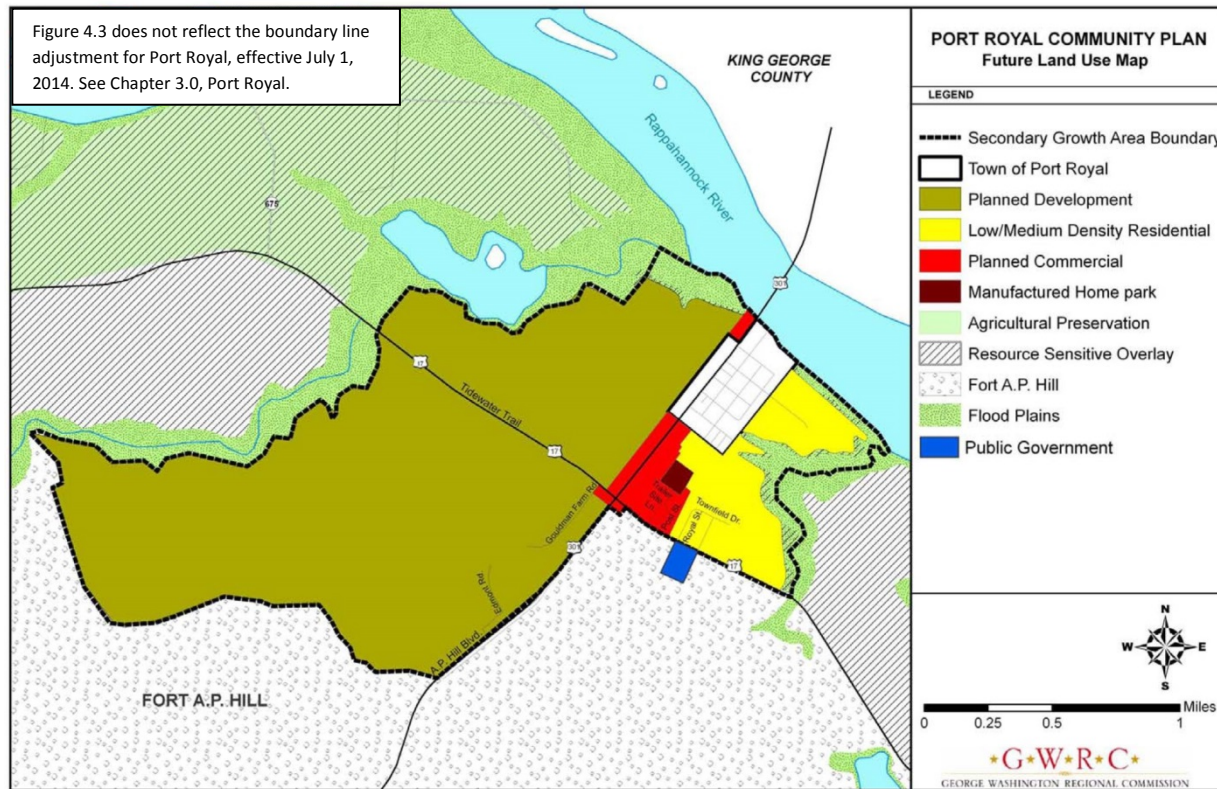
<sup>1</sup> Caroline County, Virginia, Bowling Green-Milford Community Plan, September 2006.



**Figure 4.1** Caroline County Growth Areas  
Source: Caroline County 2030 Comprehensive Plan, 2010



**Figure 4.2** Bowling Green-Milford Future Land Use Plan  
Source: Bowling Green-Milford Community Plan, 2006



**Figure 4.3** Port Royal Village Future Land Use Plan  
Source: Port Royal Community Plan, 2004

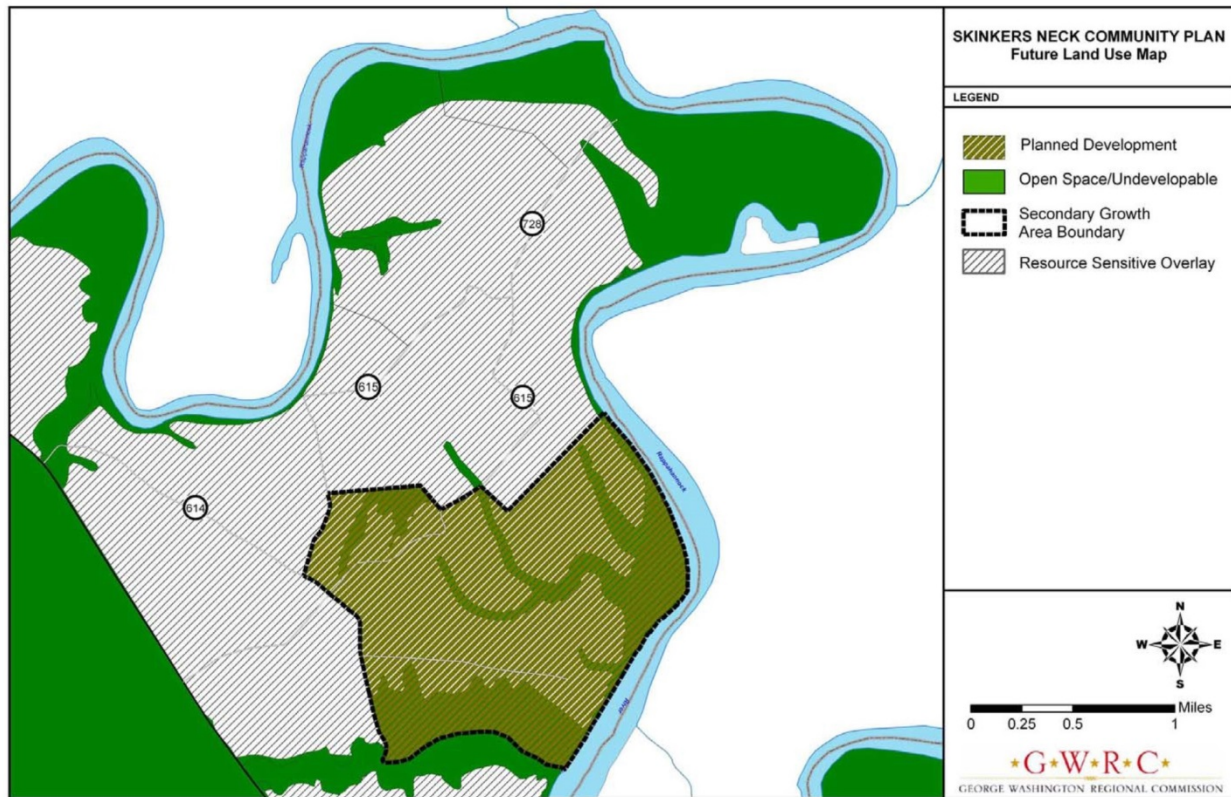
The Port Royal Village growth area is located on the Rappahannock River in northeastern Caroline County, at the intersection of U.S. Route 17 and U.S. Route 301. It is situated northeast of Fort A.P. Hill. In 2004, the county adopted the Port Royal Village Plan, which applies to the county land areas around the Town of Port Royal but does not include the town (See Figure 4.3). The plan encourages commercial development at the intersection of Route 17 and U.S. 301 and promotes residential development around Port Royal. The future land use plan designates a large portion of the area south and west of the town as planned development.

Effective July 1, 2014, a boundary adjustment between the County and the Town of Port Royal, (See Figure 4.4), added approximately 330 acres of mostly undeveloped land to the town, all of which were situated within the boundaries of the growth area. Future amendments to the Port Royal Village growth area boundary will occur to reflect the town's new boundary.



**Figure 4.4** Port Royal Boundary Line Adjustment  
Source: Town of Port Royal, July 2014

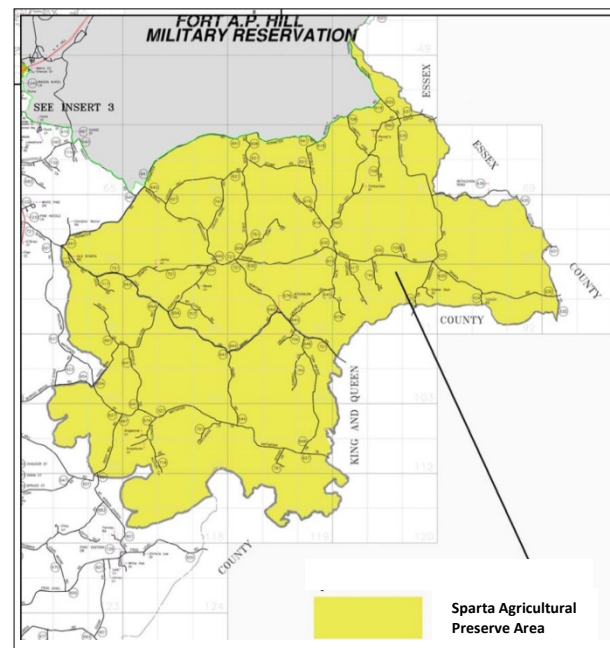




**Figure 4.5** Skinker's Neck Future Land Use Plan  
Source: Caroline County 2030 Comprehensive Plan, 2010

The Skinker's Neck Growth Area is located north of Route 17 along the Rappahannock River, northeast of Fort A.P. Hill (See Figure 4.5). Haymount, which encompasses the entire Skinker's Neck Growth Area, was approved as a planned mixed-use development in 1992 but is currently undeveloped. The site is zoned and approved for 4,000 housing units in a new urbanist style.<sup>2</sup> A new site plan will be required in order to commence construction since the previous site plan approval has expired. The timeline for the development of Haymount is unknown.

According to the Caroline County Comprehensive Plan, the southeastern portion of the county bounded by U.S. 301, Fort A.P. Hill, Essex County, and King and Queen County is designated as the Sparta Agricultural Preserve Area (See Figure 4.6). As described in the Comprehensive Plan, this area contains the largest concentration of active farms in the county and could



**Figure 4.6** Sparta Agricultural Preserve Area  
Source: Caroline County 2030 Comprehensive Plan, 2010

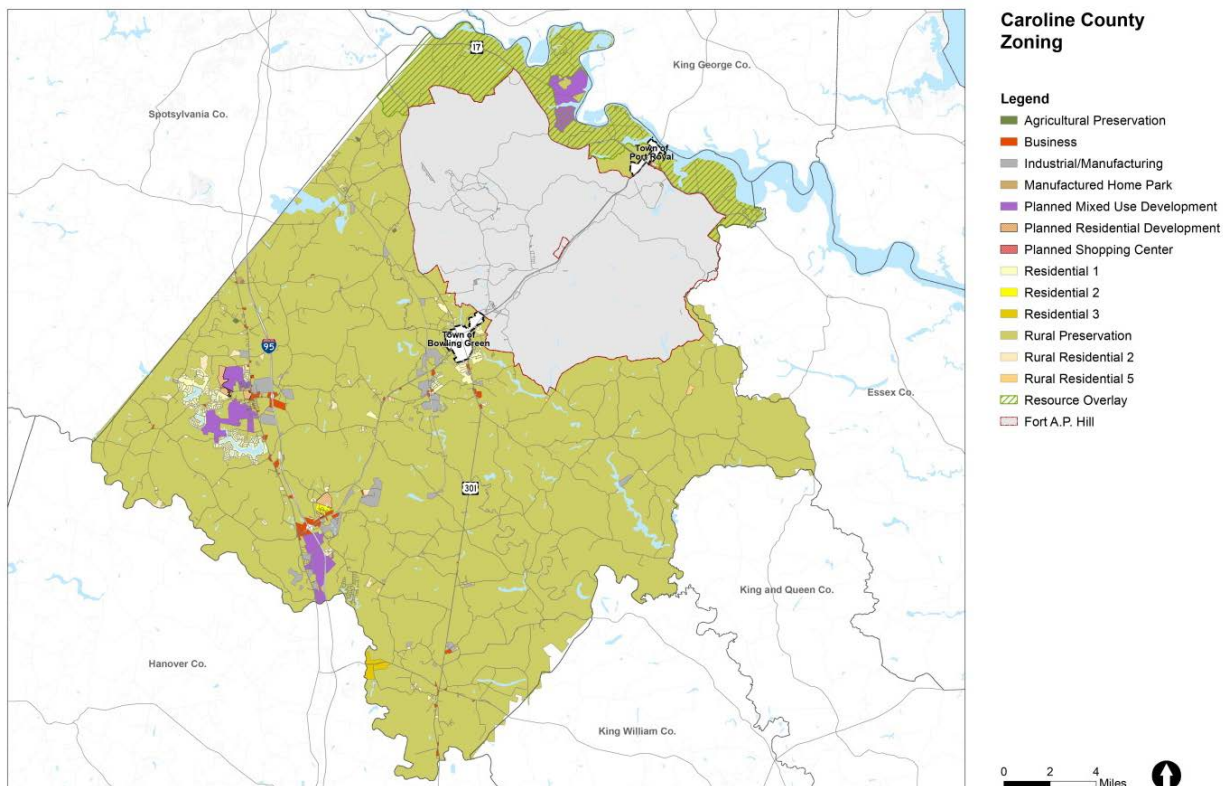
<sup>2</sup> According to the Congress for the New Urbanism, new urbanism is defined by four guiding hallmarks: "1. Livable streets arranged in compact, walkable blocks; 2. A range of housing choices to serve people of diverse ages and income levels; 3. Schools, stores and other nearby destinations reachable by walking, bicycling or transit service.; 4. An affirming, human-scaled public realm where appropriately designed buildings define and enliven streets and other public spaces." [http://www.cnu.org/who\\_we\\_are](http://www.cnu.org/who_we_are)

face substantial residential development which would impact the rural farming character of the landscape. The Comprehensive Plan suggests that the Sparta Agricultural Preserve Area be zoned for 25 acre minimum lot sizes; this would require a change in the current zoning district, rural agriculture, which sets the minimum threshold at 10 acre lot sizes. The plan also encourages property owners with land in the Sparta Agricultural Preserve Area to consider utilizing Purchase of Development Rights (PDR) and Transfer of Development Rights (TDR) programs to preserve their land. Currently, Caroline County does not have PDR and TDR programs.

#### 4.2.2 Zoning

As with county plans and policies, the County's development regulations have also evolved over the years, supporting the desires of Fort A.P. Hill to manage growth along the installation's perimeter. The majority of land around Fort A.P. Hill in Caroline County is currently zoned for rural preservation or resource conservation. These zones are intended to preserve the rural character of Caroline County and to minimize impacts on the Rappahannock River respectively. (See Figure 4.7) The rural preservation zoning classification has a ten-acre minimum lot size for residential development and the resource conservation overlay zone places additional requirements on the land by increasing the minimum lot size to 25 acres. The rural preservation district permits farms, single-family detached dwellings, places of worship, wildlife sanctuaries, public facilities, manufactured homes, and family divisions (minimum lot size 2 acres).

Zoning in the Bowling Green-Milford and Port Royal Village growth areas is designed to promote growth and development in and around the towns and includes land zoned for residential (R-1 and R-2), commercial (B-1), and planned mixed-use development (the only planned mixed-use development district near the installation is associated with the Haymount development). The R-1 district permits low density residential (1 acre min lot) and



**Figure 4.7** Caroline County Zoning  
Source: Caroline County 2013

the R-2 district permits medium density residential (1-3 units per acre). The B-1 district permits a variety of commercial activities.

Caroline County provides an opportunity for Fort A.P. Hill to participate as a member of the Department of Planning and Community Development's Technical Review Committee comprised of all departments and agencies that have state or local mandated review responsibilities or may be affected/impacted by development. The Technical Review Committee is not a voting panel, but rather a review group. As a committee member, Fort A.P. Hill receives all applications for rezoning, special use permits, major subdivisions, and site plans, and is able to remain current on development proposals that may be of interest to Fort A.P. Hill. The installation may comment on any application that is sent to either the Planning Commission or Board of Supervisors for approval. Fort A.P. Hill's comments are included as part of the record.

### 4.2.3 Infrastructure Plans

While most planned infrastructure investments are located outside of the study area, the Comprehensive Plan identifies several major infrastructure projects that need to be implemented in the study area – a water intake facility on the Rappahannock River and road widening projects for Routes 2 and 17.

The growth areas in Caroline County rely upon groundwater wells for water supply. In order to support additional growth in the growth areas, the county needs to secure an additional water source. Therefore, Caroline County is seeking a permit to withdraw water from the Rappahannock River at a site near the proposed Haymount development. The county received permits to conduct initial studies to determine the impact of the intake facility on the river and to explore alternative sites.<sup>3</sup> The planned water intake facility would require a pipeline to convey water from the Rappahannock River to the Caroline County population centers located west of Fort A.P. Hill. The location for the withdrawal has been approved and a permit has been issued by the U.S. Army Corp of Engineers. A permit from the Virginia Marine Resources Commission is pending. Two proposed routes for the pipeline have been identified: 1) south along U.S. Route 17, west along U.S. 301 to Bowling Green and along Route 207 to Carmel Church; or 2) north along U.S. Route 17, south along Route 2 and west along several roads to reach Ladysmith.<sup>4</sup> The final route of the proposed water main has not been determined. Additional feasibility and environmental studies for the water intake facility are needed.

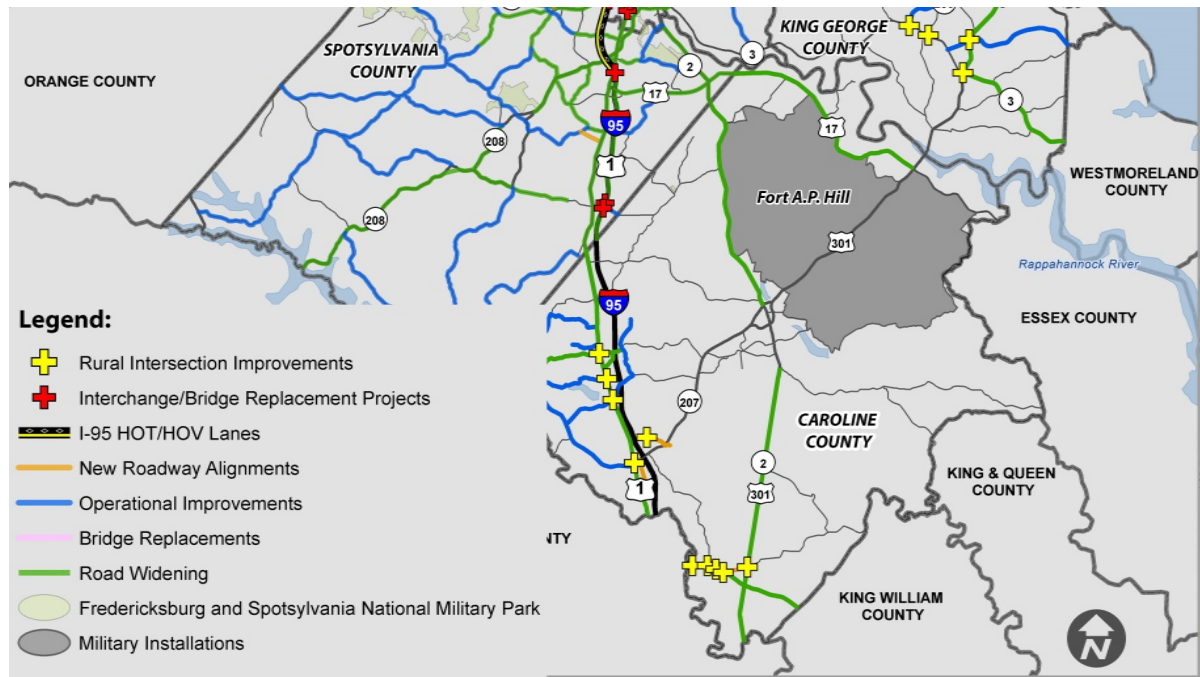
The Comprehensive Plan includes two road projects that are near the study area. Both projects are included in the Draft 2040 Long Range Transportation Plan (LRTP) prepared by the Fredericksburg Area Metropolitan Planning Organization (FAMPO) and George Washington Regional Commission (GWRC). The LRTP identifies a long list of transportation needs and a short list of critical transportation projects. While all projects are necessary to alleviate congestion and meet future demands, the projects on the critical transportation list are prioritized to receive funding. Two projects on the long list within Caroline County are near Fort A.P. Hill: widening Route 2 and widening Route 17. The projects, which are conceptual and unfunded, are intended to meet future transportation needs as the region's population continues to grow and alleviate congestion. The two lane portion of U.S. Route 17 that is proposed for widening is the only portion of U.S. Route 17 that is not four lanes or more. The development of major projects along U.S. Route 17, like Haymount, would impact transportation plans. In addition, U.S. Route 17 is also designated as a hurricane evacuation route.

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<sup>3</sup> Memorandum from Joseph C. Schiebel, Interim Director of Public Utilities to Percy C. Ashcraft, County Administrator. Dated February 1, 2011, "Project Update / Rappahannock River Raw Water Intake Permit"

<sup>4</sup> *ibid.*





**Figure 4.8** FAMPO Draft Highway Needs Map

Source: Fredericksburg Area Metropolitan Organization, Draft 2040 Long Range Transportation Plan, 2013

## 4.3 Challenges and Opportunities

### 4.3.1 Challenges

- Lost Revenues.** Fort A.P. Hill encompasses about one-fifth of the county's overall land area but does not contribute tax revenue dollars to the county and the federal government does not pay the County any revenues in lieu of taxes (i.e. payment in lieu of taxes (PILT)). Efforts by Fort A.P. Hill to expand or support land conservation programs such as easements through the Army's Compatible Use Buffer Program or other initiatives can exacerbate this issue (and have concerned County Officials) if the efforts do not align with large county-wide conservation (i.e. agricultural preservation) and development goals and objectives.
- Limited Economic Benefits.** The nature of the training that occurs at the installation is unlike most installations in that the number of permanently stationed personnel is very low compared to the large number of transient personnel. The installation's direct and indirect economic impacts have not been quantified for local communities. While Fort A.P. Hill is a major employer in the county (as noted in the Caroline County 2030 Comprehensive Plan), the overall local economic impacts generated by the installation are not well understood but are anticipated to be low based on the transient-focused training mission.
- Aircraft Training Routes Extend into County.** Caroline County has identified growth areas that are located in very close proximity to Fort A.P. Hill. Future land use and zoning in these areas is supportive of increased investment and development. In addition, the installation has defined helicopter operational routes that extend the entire length of the installation's perimeter in Caroline County.

- **Noise.** Fort A.P. Hill operations involving aircraft and live-fire range operations generate noise that impacts Caroline County residents. The tolerance for noise varies from individual to individual and can be affected by the characteristics of the noise itself such as the intensity and spectral qualities; duration; repetitions; abruptness of onset or cessation; and the ambient noise climate (or background noise) against which a particular event occurs.<sup>5</sup> See Chapter 8.0, Fort A.P. Hill, for technical information about the installation's noise impacts and noise management programs. The following noise related challenges were documented for Caroline County as part of the JLUS process.
  - **Aircraft Noise.** Fort A.P. Hill aircraft operations generate noise impacts in the county. About eight aviation noise complaints were documented by Fort A.P. Hill in and around the fan areas of Caroline County between 1996 and 2012. Operations associated with the Assault Landing Zone (ALZ), Drop Zone (DZ), Hill Field (formerly Army Airfield) and various other landing areas utilize fixed wing and rotary wing aircraft.
  - **Small Arms Noise.** Small arms training at direct-fire and indirect-fire ranges generates impulse noise that can be heard outside of the installation. Based on documented Fort A.P. noise zones, (See Chapter 8.0, Fort A.P. Hill) approximately 5,100 acres in Caroline County are impacted by the small arms noise. Fort A.P. Hill noise complaint data indicates that two noise complaints were reported for small arms noise between 1996 and 2012.
  - **Large Weaponry and Demolition Noise.** Noise associated with large caliber weapons and low frequency sounds extends into Caroline County. Over 30 noise complaints were documented by Fort A.P. Hill for the county between 1996 and 2012 associated with this type of noise. The noise complaint locations suggest that actual noise associated with large weaponry and demolition may extend beyond both the defined average noise contours and peak contours (See Chapter 8.0, Fort A.P. Hill).
- **Vibration.** Airborne vibration associated with lower frequency operational noise such as explosives and large caliber weapons, and vibration from aircraft have been experienced by residents which has caused damage to some homes.
- **Air Pollution.** Fort A.P. Hill conducts prescribed burning in support of forest management activities on training lands. Controlled burns have caused smoke and dust impacts in the communities surrounding the installation, including Caroline County. Concerns exist regarding the potential for localized health impacts from the smoke and pollutant emissions associated with the burns and potential release of harmful particulates. Similar concerns also exist with the detonation of explosives.
- **Water Supply and Quality.** The town and surrounding communities rely upon groundwater for drinking water supply. Concerns exist about whether toxic releases from operations at Fort A.P. Hill are or could affect groundwater today or in the future. The Virginia Department of Environmental Quality (DEQ) publishes the Virginia Toxics Release Inventory (TRI) Report, pursuant to Virginia Code § 10.1-1186.1 on an annual basis. Quantities of released toxins are broken into a number of categories including releases to air, releases to water, and releases to land. In addition, the report documents transfers of chemicals off-site, on-site waste treatment and source reduction and recycling activities. According to the reports, between 2010 and 2011 between four and five facilities reported toxic releases in Caroline County, including Fort A.P. Hill. As a whole, Caroline County's ranking in Virginia for pounds of on-site release has increased from 85 out of 100 in 2010 to

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<sup>5</sup> Fort A.P. Hill Operational Noise Management Plan, 2011.

43 out of 96 in 2012. However, the County's ranking for pounds of on-site management has remained fairly stable with a ranking of 52 out of 100 in 2010 and 51 out of 96 in 2012. Fort A.P. Hill is the largest contributor of releases in the county and the amount of toxins released greatly varies from year to year. For example, according to the 2011 and 2012 reports, Fort A.P. Hill released a total of 94,573 pounds of nitroglycerin on site in 2011 and 29,763 pounds of nitroglycerin on site in 2012.<sup>6 7</sup> In addition, the installation ranked 291 out of 423 in Virginia in 2010 for pounds of on-site release but ranked 75 out of 416 for pounds of on-site release in 2012. The installation ranked 384 out of 423 for pounds of on-site management in 2010 but ranked 412 out of 416 in 2012.

- Lack of Permanent Personnel at Fort A.P. Hill.** In recent years, new missions have located at Fort A.P. Hill, including the Asymmetric Warfare Group (AWG) complex and the U.S. Army Explosive Ordnance Disposal (EOD) Field Training Activity. New missions have not included the relocation of headquarter-level commands (i.e., the AWG headquarters is located at Fort Meade, Maryland) that typically bring permanently-stationed personnel. An increase in permanently-stationed personnel could lead to an increase in economic activity in the towns and county growth areas and would support business development. The number of permanently stationed troops at Fort A.P. Hill is low and the average daily supported population varies greatly based on training activities (see Chapter 8.0, Fort A.P. Hill). Efforts to attract new missions could be improved by aligning Fort A.P. Hill with the Washington-Baltimore-Northern Virginia, DC-MD-VA-WV-PA locality pay area which includes Spotsylvania County, Stafford County, and the City of Fredericksburg. Currently, Fort A.P. Hill is part of the Richmond locality pay area. In addition, increasing the per diem rate for temporary duty personnel so that it aligns with the Stafford County per diem rate would also be beneficial.
- Attracting Hotel Franchises.** Fort A.P. Hill has expressed a strong need for nearby lodging to support military transient personnel that come and train at Fort A.P. Hill. According to Fort A.P. Hill, a significant number of military personnel are reported to travel ½ hour or more to Fredericksburg and other areas to obtain lodging. The county and towns would like to address this need. Obtaining private financing in today's market is challenging for businesses, especially hoteliers when financing tools require guarantees such as hotel room nights. Without such guarantees, efforts to attract hoteliers to the town have been constrained.

#### 4.3.2 Opportunities

- Formalized Coordination.** An ongoing implementation body or committee that meets on a regular basis to share information, monitor implementation progress, and revisit longer-term strategies can be an effective mechanism for collaboration. For example, a Memorandum of Understanding (MOU), when pursued in conjunction with an implementation body, can address protocols for communication and information exchange.
- County and Fort Growth.** Additional business, like restaurants and hotels, offices, and support services would increase the county's revenue and would provide additional amenities to those living in the area and coming to train – including any future missions. The county desires a better understanding of Fort A.P. Hill's base service and retail needs (housing, convenience, food, dry cleaners, etc.) and would like to work with Fort A.P. Hill to identify ready locations within the county growth areas to address these needs.

<sup>6</sup> Virginia DEQ, 2011 Virginia Toxics Release Inventory Report, 2013. As described in the report, the Toxics Release Inventory contains reported information on the quantities of chemicals released and managed, not the public's exposure to, or risk from, the chemicals. Risk to human health by a chemical release depends on the toxicity of the chemical; how it disperses, reacts, or persists in the environment; the quantity, concentration and type of human exposure. Chemicals reported for the TRI Report are not weighted by their toxicity. Annual reports from DEQ are available from 2007 through 2012 and include detailed appendices inclusive of jurisdiction and facility rankings. The reports are available online at <http://www.deq.virginia.gov/Programs/Air/AirQualityPlanningEmissions/SARATitleIII/SARA313ToxicsReleaseInventory.aspx>.

<sup>7</sup> Virginia DEQ, 2012 Virginia Toxics Release Inventory Report, 2014.

- **Business Opportunities for Local Contractors.** The county would like to see more contracting opportunities for local businesses for maintenance, construction and other services at Fort A.P. Hill. The Army must adhere to Federal contracting regulations but having more opportunities available for local and small businesses located in the county is highly desired and would improve the business relationship between the county and Fort A.P. Hill.
- **Reduce Noise Impacts through Land Use Process.** Proffered commitments to address noise attenuation, lighting, and/or other measures as part of rezoning applications, subdivision approvals for new development, or subdivision regulations could raise awareness about nearby military operations and help reduce noise impacts on future residents. Further study is required to confirm the costs and benefits.
- **Reduce Noise Impacts through Modification to Aircraft Operations.** Fort A.P. Hill currently observes unofficial courtesy flight avoidance areas over the Towns of Bowling Green and Port Royal and informs pilots of these areas during in-briefings to avoid these inhabited areas. However, according to comments received during the JLUS process, flights over these areas do occur and enforcement of the avoidance areas is a recognized challenge by Fort A.P. Hill. An official “no fly” zone over the town would help minimize noise impacts from all (installation and non-installation) aircraft activity on current and future residents. However, according to Fort A.P. Hill representatives, an official no fly zone would have to be established by the Federal Aviation Administration (FAA), not Fort A.P. Hill.
- **Contain Noise from Future Missions to Inside Installation Boundaries.** Current noise levels at Fort A.P. Hill extend into the surrounding communities. Future noise impacts on the community could be significantly reduced by ensuring that any new noise-generating mission keeps all noise impacts and noise contours within the installation boundaries.
- **Coordinated Development Reviews.** Caroline County and Fort A.P. Hill coordinate on development reviews. For example, a representative from the installation participates as a member of the county’s Department of Planning and Community Development’s Technical Review Committee. As a committee member, Fort A.P. Hill receives all applications for rezoning, special use permits, major subdivisions, and site plans, and is able to remain current on development proposals that may be of interest to Fort A.P. Hill. The installation may comment on any application that is sent to either the Planning Commission or Board of Supervisors for approval. The installation’s comments are included as part of the record.
- **Utility Extensions.** Natural gas service would benefit Fort A.P. Hill, the Town of Bowling Green, and would help support development activities in the town and Caroline County. Domestic natural gas is a cleaner burning fuel than coal or oil, is cost competitive against other commodities, and contributes to energy security goals set forth by the Department of Defense. Efforts to expand natural gas service in the area are underway, including construction of a natural gas pipeline from Carmel Church to Milford that could be immediately capitalized on to extend the natural gas directly into the Town of Bowling Green. In addition, right of way along U.S. 301 would provide a possible route to extend water service to identified growth areas in the county. Extension of water along this corridor would provide a reliable source of water for existing developed areas and could provide a redundant water supply for Fort A.P. Hill. Collaboration among Fort A.P. Hill, the Towns of Bowling Green and Port Royal, and Caroline County could provide multiple benefits for all parties.

## 4.4 Recommendations

Based on feedback received from Caroline County, this section establishes a set of recommended actions for the county to consider that could strengthen coordination between the county and Fort A.P. Hill. The recommendations are organized into the categories described below.

- **Coordination** – to facilitate coordination between Caroline County and Fort A.P. Hill.
- **Communication** – to improve the dissemination of locality and military operational information.
- **Economic Development** – to foster economic development opportunities in Caroline County.
- **Utilities** – to evaluate opportunities for improved broadband services around Fort A.P. Hill.
- **Community Development** – to reduce noise and vibration impacts on residents.

Each recommendation includes action steps, a timeframe, rough order magnitude of costs and staffing requirements.

- **Timeframe.** Identifies when the proposed recommendation should be initiated using one of three timeframe categories:
  - **Immediate (highest priority)** Now
  - **Short-term (high priority)** Less than one year
  - **Mid-term (moderate priority)** Between one and four years
  - **Long-term (lower priority)** More than four years
- **Order of Magnitude Cost.** Provides a high level, Rough Order-of-Magnitude (ROM) cost impact for local jurisdictions and Fort A.P. Hill to implement the strategy. Costs do not consider efforts undertaken by other parties beyond the JLUS partners.
  - **\$** = < \$100,000
  - **\$\$** = \$100,000 - \$300,000
  - **\$\$\$** = > \$300,000
- **Potential Staffing Requirements.** Provides an estimate of the potential required staff involvement and staff time of local jurisdictions and/or Fort A.P. Hill to implement the recommendation. Staffing requirements do not include efforts conducted by other parties.
  - **L** = minimum
  - **M** = moderate
  - **H** = high

Table 4.1 Caroline County JLUS Recommendations

Recommendation		Action Steps	Timeframe	Cost	Staffing
Coordination	1.1	<p>Through an executed MOU to be prepared and approved by the study partners establish the Executive Steering Committee (ESC) including local elected officials and the Fort A.P. Hill Garrison Commander to discuss community, and installation issues on a regular scheduled basis. Examples of areas for discussion may include but are not limited to the following:</p> <ul style="list-style-type: none"> <li>• Capital improvement and infrastructure planning.</li> <li>• Comprehensive plan and other planning document updates.</li> <li>• Long-range planning for newly proposed missions and on-base facilities, recognizing mission-related operational security requirements exist.</li> <li>• Environmental studies related to air and water quality impacts.</li> <li>• Pursuit of funding for studies.</li> </ul>	Short term	-	-
	1.2	<ul style="list-style-type: none"> <li>• Provide the opportunity for input from the Fort A.P. Hill on all development related proposals and text amendments and consider the input in decision-making processes.</li> <li>• Fort A.P. Hill provides written input on development related proposals and text amendments.</li> </ul>	Short-term	\$	M
	1.3	<ul style="list-style-type: none"> <li>• Encourage Fort A.P. Hill participation during plan update processes.</li> <li>• Share plan update schedules with Fort A.P. Hill.</li> </ul>	Short-term	\$	M
	1.4	<ul style="list-style-type: none"> <li>• Define process for locality involvement in installation planning processes so that input can be obtained before plans are finalized.</li> <li>• Fort A.P. Hill to hold regular meetings/briefings with locality representatives during plan/project developments.</li> </ul>	Short-term	\$	M

Recommendation			Action Steps	Timeframe	Cost	Staffing
Communication	2.1	Issue Fire Warning Orders (through Caroline Alert and other media and social network venues) of training activities that are non-routine and have the potential to be louder than normal, as well as controlled burn activities, including the proposed time and duration of aviation and ordnance operations.	<ul style="list-style-type: none"><li>• Work with the Fort A.P. Hill Public Affairs Officer (PAO) to define multiple media and social network outlets for alerts.</li><li>• Develop template for alerts defining information elements.</li><li>• Localities to include warnings on websites and social media venues.</li></ul>	Short-term	\$	M
	2.2	Support Fort A.P. Hill’s efforts to develop an outreach program to educate local citizens and electric utility providers about the impacts of lighting on Fort A.P. Hill operations.	<ul style="list-style-type: none"><li>• Fort A.P. Hill and localities coordinate to produce outreach materials, illustrative examples and guidelines on ways to reduce lighting impacts.</li><li>• Coordinate with utility providers.</li><li>• Post materials on websites.</li><li>• Hold public lighting workshops to inform citizens and utility providers about minimization techniques.</li></ul>	Mid-term	\$\$	M
	2.3	Update locality website to recognize Fort A.P. Hill, its mission, its location, links to the Fort A.P. Hill web page, contact information for key personnel, and fire warning orders.	<ul style="list-style-type: none"><li>• Update community websites with links to Fort A.P. Hill personnel contact information, fire warning orders, and noise reporting procedures.</li></ul>	Mid-term	\$\$	M
Economic Development	3.1	Support the installation’s pursuit of establishing Washington-Baltimore-Northern Virginia General Schedule (GS) pay grades for all personnel stationed at Fort A.P. Hill.	<ul style="list-style-type: none"><li>• Localities to write letters of support for Fort A.P. Hill to pursue pay grade issue with the U.S. Office of Management and Budget.</li></ul>	Short-term	\$	M
	3.2	Support Fort A.P. Hill’s pursuit of increasing the per diem rate for temporary duty personnel so that it aligns with Stafford County per diem rate, which is in the same region as Fort A.P. Hill and Caroline County.	<ul style="list-style-type: none"><li>• Localities to write letters of support for Fort A.P. Hill per diem rate increase.</li></ul>	Mid-term	\$	M
	3.3	Using manning/training personnel data from Fort A.P. Hill (updated on a bi-annual basis), pursue commercial and retail uses off base that support on base employees and local visitors, tourists and residents.	<ul style="list-style-type: none"><li>• Fort A.P. Hill to establish a recurring data collection process to document training personnel numbers of partner groups and rotational units.</li><li>• Provide data to ESC on bi-annual basis.</li></ul>	Short-term	\$	M
	3.4	Ensure proper County and Town business licenses are in place for all construction activity at Fort A.P. Hill through improved oversight and accountability.	<ul style="list-style-type: none"><li>• Fort A.P. Hill to arrange meeting with Caroline County, Town of Bowling Green and Fort Belvoir / Army Corps of Engineers to discuss county requirements.</li></ul>	Short-term	\$	L
	3.5	Working with the Towns of Bowling Green and Port Royal and Fort A.P. Hill, jointly study the economic impacts of conservation easements and non-taxable lands on municipal revenue streams.	<ul style="list-style-type: none"><li>• Prepare scope of work for study and pursue funding for study.</li></ul>	Mid-term	\$	M

Recommendation			Action Steps	Timeframe	Cost	Staffing
Utilities Services	4.1	Jointly study the feasibility and potential mechanisms for shared water supply and sewer utility services among Fort A.P. Hill, the Town of Port Royal, Town of Bowling Green, and Caroline County.	<ul style="list-style-type: none"><li>• Localities to develop initial concept plans for water and sewer utilities for review with Fort A.P. Hill.</li><li>• Hold meeting with American Water to evaluate concept ideas and fort options for supporting shared use (land, etc.).</li><li>• Pursue funding for shared services study pending outcome.</li></ul>	Mid-term	\$\$	M
	4.2	Pursue natural gas service to serve Fort A.P. Hill and the Town of Bowling Green/Milford Primary Growth Area.	<ul style="list-style-type: none"><li>• Caroline County, Fort A.P. Hill, and Town of Bowling Green will coordinate with utility providers for provision of natural gas service from Milford.</li><li>• Pursue funding for pipeline extension project.</li></ul>	Immediate	\$\$\$	M
	4.3	Work with Fort A.P. Hill, Town of Port Royal, and Town of Bowling Green to obtain utility rights of way along U.S. 301 for a major water distribution line that will bring water from the Rappahannock River (a new source) to the entire county.	<ul style="list-style-type: none"><li>• Localities to collaborate and define preferred right of way for water line.</li><li>• Meet with Fort A.P. Hill to discuss right of way concept.</li><li>• Encourage Fort A.P. Hill to define right of way in installation long-range plans to ensure preservation of corridor for utility purposes.</li></ul>	Immediate	\$	M
Community Development/ Planning	5.1	Support real estate disclosure for prospective buyers or renters as part of real estate transactions.	<ul style="list-style-type: none"><li>• Incorporate statement on subdivision plats and site plans regarding proximity to Fort A.P. Hill and potential for noise.</li><li>• Encourage the Fredericksburg Area Association of Realtors (FAAR) to develop a basic disclosure statement and an amended point of sale document that includes disclosure.</li></ul>	Mid-term	\$\$	H
	5.2	Encourage sound attenuation for new construction of residences, schools, hospitals, nursing homes, churches and other buildings with public gathering spaces.	<ul style="list-style-type: none"><li>• Study the costs and benefits of sound attenuation and use outcome to determine if pursuit of State Code amendment is desired.</li><li>• Utilize the proffer system or special use permit requirements to achieve higher sound attenuation standards.</li><li>• Consider the development of model sound attenuation standards for new construction.</li></ul>	Mid-term	\$\$	M
	5.3	Consider developing a model 'Dark Skies' Ordinance that sets forth specific requirements for lighting. Consider applying the ordinance county and town-wide for all 6 JLUS communities. Incorporate input from Fort A.P. Hill.	<ul style="list-style-type: none"><li>• Develop dark skies ordinance (using input from installation).</li><li>• Incorporate lighting best practices into standard subdivision and plan review processes.</li><li>• Provide information to utility providers regarding requirements.</li></ul>	Mid-term	\$\$	M



Recommendation		Action Steps	Timeframe	Cost	Staffing
5.4	Develop a voluntary sound attenuation and lighting retrofit program for existing noise sensitive uses and high-demand lighting uses (such as sports complexes). Investigate federal or state funds to offset potential retrofit costs.	<ul style="list-style-type: none"> <li>• ESC to jointly conduct a feasibility study for a residential sound and lighting retrofit program.</li> <li>• Identify potential retrofit candidates.</li> <li>• Research funding sources.</li> </ul>	Long-term	\$\$	M
5.5	Support the establishment of a “No Fly” Zone covering the Towns of Bowling Green and Port Royal and their designated growth areas and extending outward one mile from the boundary.	<ul style="list-style-type: none"> <li>• Meet with Fort A.P. Hill to clarify air space restrictions and authorities.</li> <li>• Work with Fort A.P. Hill to formalize a no fly zone in operating regulations.</li> <li>• Meet with FAA to discuss options for a no fly area and modification of airspace restrictions.</li> <li>• In the absence of an FAA designated “No Fly” zone, enhance the designated “Flight Avoidance Area” designation.</li> </ul>	Short-term	\$	L
5.6	Work with Fort A.P. Hill to limit noise generated from future or expanded operations or missions at the installation to inside Fort A.P. Hill boundaries.	<ul style="list-style-type: none"> <li>• Participate in U.S. Army Environmental Impact Statements and Environmental Assessments that evaluate new mission impacts.</li> <li>• Discuss noise limitation concepts with Fort A.P. Hill leadership.</li> </ul>	Mid-term	\$	L

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## 5.0 Essex County

### 5.1 Community Profile

Essex County is located south and east of Fort A.P. Hill in the northeast section of Virginia's Middle Peninsula. The county is approximately 100 miles south of Washington, D.C. and 45 miles northeast of Richmond. Essex County's northeastern border is the Rappahannock River and a large portion of the county's northwestern border abuts Fort A.P. Hill. The approximately 261-square mile county is primarily rural, including the area of the county bordering Fort A.P. Hill.

Essex County land use is primarily agricultural, forestry, and rural residential scale development. Agriculture and the natural environment are identified as key elements in helping to preserve the county's rural character and lifestyle. According to the 2014 Draft Comprehensive Plan, forested and agricultural uses combine to account for 94% of the county's land area.<sup>1</sup> The primary population center of the county is in and around the Town of Tappahannock, which is approximately 30 miles southeast of Fort A.P. Hill. Population growth has been low to moderate; between 2000 and 2010 the U.S. Census reported a population growth rate of 11% bringing the county's population to 11,151. According to the Draft Comprehensive Plan, a slow to moderate growth rate is expected to continue.

### 5.2 Current Tools and Programs

#### 5.2.1 Comprehensive Plan and Future Land Use

Essex County is in the process of updating the County Comprehensive Plan, which was last adopted in 2003. A Draft of the Comprehensive Plan is currently available for general review. The overall goal of the Comprehensive Plan is to: "maintain and enhance the quality and character of the County by promoting the efficient use of the County's land and natural resources in order to effectively meet the social and economic needs of present and future residents providing for a more balanced and sustainable community."<sup>2</sup> The Plan is a general, long-range, policy and implementation guide and is intended to serve as a framework to manage and direct future development in the county.

Essex County defines eight planning districts, including the Town of Tappahannock, and each district maintains guidelines for development and growth management. Land in Essex County within two to three miles of Fort A.P. Hill is designated as either a Countryside District or an Agricultural Preservation District. Both of these districts are intended to limit development and preserve the rural character of Essex County. In addition, a number of parcels in the county have been placed under conservation easement to preserve the rural and agricultural landscape, including productive crop and timber harvests. Short-term future growth is directed to the Development Service Districts and long-term future growth to the Deferred Development District which are near the Town of Tappahannock and more than 20 miles from the Fort A.P. Hill perimeter.

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<sup>1</sup> Essex County Draft Comprehensive Plan, June 9, 2014, page 58.

<sup>2</sup> Essex County Draft Comprehensive Plan, June 9, 2014, page 10.

### 5.2.2 Zoning

Land adjacent to Fort A.P. Hill in Essex County falls under the agriculture preservation (A1) district. The A1 zoning district permits one dwelling per 20 acres, unless the parcel is less than 20 acres and then there may be 1 dwelling unit per 5 acres.

### 5.2.3 Infrastructure Plans

There are currently no major infrastructure projects planned for the area of Essex County near Fort A.P. Hill.

## 5.3 Challenges and Opportunities

### 5.3.1 Challenges

- **Rotary Aircraft Noise.** Fort A.P. Hill rotary aircraft operations currently generate noise impacts in the northwestern portion of Essex County. The aircraft utilize the Range 24 bomb run and the Range 25 gunnery complex for air-to-ground live fire training activities (see Chapter 8.0, Fort A.P. Hill). These facilities are situated near the Essex County border and flight pattern approaches associated with these activities occur in Essex County. Aircraft can travel as low as 500 feet above mean sea level (MSL) as they enter the installation. Annual training events occur 4-5 times a year and air operations of this nature generate noise from the live-fire activity and the aircraft themselves.
- **Small Arms Noise.** Small arms training at direct-fire and indirect-fire ranges generates impulse noise that is heard in Essex County. Based on a documented Fort A.P. Hill Small Arms Range Noise Zone of 87-104 dBP (un-weighted peak decibels), approximately 700 acres is impacted by the small arms noise contour.
- **Large Weaponry and Demolition Noise.** Noise associated with large caliber weapons and low frequency sounds extends into Essex County. This type of noise is expressed by C-weighted Day-Night Level (CDNL) noise contours on Fort A.P. Hill noise contour maps and in peak noise contours that measure single events. Overall about 85 acres of land are identified under the 62-70 CDNL noise contour and 4,000 acres are identified under the 57-62 CDNL contour. The peak noise contours for large caliber weapons covers a much larger area. Peak noise contours are used to represent individual noise events. In Essex County, approximately 10,000 acres are impacted by the 115 dBP contour and about 450 acres are impacted by the 130 dBP. Noise complaints have been documented in the county associated with this type of noise. The noise complaint location suggests that actual noise associated with large weaponry and demolition may extend beyond both the defined average contours and peak contours.
- **Vibration.** Airborne vibration associated with lower frequency operational noise such as explosives and large caliber weapons is an issue for certain areas of the county. Structural shaking and window rattling complaints have been documented.
- **Broadband Infrastructure.** As a rural county, Essex County is faced with challenges in providing broadband services for residents. According to the 2014 Draft Comprehensive Plan, the county is an active participant in the Middle Peninsula Broadband Authority that is tasked with identifying the most practical and economically feasible approach to overcoming the challenges that rural counties face in providing broadband services. The Broadband Authority is exploring various models that were recommended as a part of Center for Innovative Technology broadband study. The proximity to Fort A.P. Hill and access to existing broadband providers that service the installation could offer expanded opportunities to provide this service.

- **Oil and Gas Exploration.** Advances in non-conventional oil and gas drilling, known as hydraulic fracturing, has heightened interest in energy production from hydrocarbon formations in Virginia, including the Taylorsville Basin in Essex County.<sup>3</sup> Mineral right leases are in place on over 13,000 acres of land in the northern part of the county that sits within the Taylorsville Basin. The county is committed to protecting the public health, safety, and welfare of its communities, and the environment from adverse effects of industrial scale activities related to oil and gas exploration and drilling and to minimize potential short and long term land use conflicts that could arise.<sup>4</sup>

### 5.3.2 Opportunities

- **Open Communication.** The County routinely shares Board of Supervisors' meeting agendas with Fort A.P. Hill and welcomes ongoing communication efforts by the installation to share information about operations. Certain areas of the county are more directly impacted by installation activities than others and increased efforts to share information about operations will help residents anticipate impacts. Activities related to natural gas or oil drilling is expected to increase and coordination and information about these activities will benefit both parties.
- **Reduce Noise Impacts.** New residents are typically less familiar with the noise impacts of the nearby installation. Voluntary programs to reduce noise impacts in new buildings through sound attenuation and making buyers aware of nearby operations could help reduce future conflicts.
- **Expanded Broadband.** Providing efficient broadband service to rural parts of the county has proven to be a challenge. Essex County is a participant in the Middle Peninsula Broadband Authority that is working to address gaps in rural broadband capacity.

## 5.4 Recommendations

Based on feedback received from Essex County, this section establishes a set of recommended actions for the county to consider that could strengthen coordination between the county and the installation. The recommendations are organized into the categories described below.

- **Coordination** – to facilitate coordination between Essex County and Fort A.P. Hill.
- **Communication** - to improve the dissemination of locality and military operational information.
- **Economic Development** - to foster economic development opportunities in Essex County.
- **Utilities** – to evaluate opportunities for improved broadband services around Fort A.P. Hill.
- **Community Development/Planning** - to reduce noise and vibration impacts on residents.

Each recommendation includes action steps, a timeframe, rough order magnitude of costs and staffing requirements.

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<sup>3</sup> Essex County Draft Comprehensive Plan, June 9, 2014, page 25.

<sup>4</sup> *ibid.*

## FINAL

- **Timeframe.** Identifies when the proposed recommendation should be initiated using one of three timeframe categories:
  - **Immediate (highest priority)** Now
  - **Short-term (high priority)** Less than one year
  - **Mid-term (moderate priority)** Between one and four years
  - **Long-term (lower priority)** More than four years
- **Order of Magnitude Cost.** Provides a high level, Rough Order-of-Magnitude (ROM) cost impact for local jurisdictions and the installation to implement the strategy. Costs do not consider efforts undertaken by other parties beyond the JLUS partners.
  - **\$** = < \$100,000
  - **\$\$** = \$100,000 - \$300,000
  - **\$\$\$** = > \$300,000
- **Potential Staffing Requirements.** Provides an estimate of the potential required staff involvement and staff time of local jurisdictions and/or Fort A.P. Hill to implement the recommendation. Staffing requirements do not include efforts conducted by other parties.
  - **L** = minimum
  - **M** = moderate
  - **H** = high

Table 5.1 Essex County JLUS Recommendations

Recommendation		Action Steps	Timeframe	Cost	Staffing	
Coordination	1.1	<p>Through an executed MOU, work with the other JLUS partners to establish the Fort A.P. Hill Executive Steering Committee (ESC) including local elected officials and the Fort A.P. Hill Garrison Commander to discuss community, installation and other compatibility issues on a regular scheduled basis and to coordinate and collaborate on the following:</p> <ul style="list-style-type: none"><li>• Capital improvement and infrastructure planning</li><li>• Comprehensive plan and other planning document updates</li><li>• Long range planning for newly proposed missions and on-base facilities, recognizing mission-related operational security requirements exist</li><li>• Environmental studies related to air and water quality impacts</li><li>• Pursuit of joint funding for studies</li></ul> <p>The ESC should include a Working Committee at the planning director level that will form subcommittees as necessary to explore specific issues and opportunities.</p>	<ul style="list-style-type: none"><li>• Agree upon key communication procedures contained in the draft MOU and identify primary internal points of contact to produce and receive notices.</li><li>• Identify appropriate secondary partners for participation in the MOU.</li><li>• Sign the MOU.</li><li>• Define issues to review and information to share.</li><li>• Exchange information about upcoming infrastructure studies and plans.</li><li>• Modify planning processes to include opportunity for installation/community input early on - before development of alternatives and as part of benefits/impacts review.</li><li>• Involve utilities and public works personnel in discussions.</li><li>• Explore ways to include the installation in any sub committees that are formed for plan updates (i.e. transportation, utilities, etc.).</li><li>• Fort A.P. Hill to hold regular meetings/briefings with locality representatives during plan/project developments.</li></ul>	Immediate	-	-
	1.2	<p>Continue to solicit input from Fort A.P. Hill as part of a technical review process on development related submittals and text amendments within the Fort A.P. Hill influence area.</p>	<ul style="list-style-type: none"><li>• Formalize Fort A.P. Hill as a technical review committee member or similar status and define consultation procedures to obtain installation input.</li><li>• Seek input from the installation on all development related proposals and text amendments and consider the input in decision-making processes.</li><li>• Fort A.P. Hill provides written input on development related proposals and text amendments.</li></ul>	Short-term	\$	M
Communication	2.1	<p>Issue Fire Warning Orders (through Caroline Alert and other media and social network venues) of training activities that are non-routine and have the potential to be louder than normal, as well as controlled burn activities, including the proposed time and duration of aviation and ordnance operations.</p>	<ul style="list-style-type: none"><li>• Fort A.P Hill Public Affairs Officer (PAO) to define multiple media and social network outlets for alerts, including ESC and ICC.</li><li>• Develop template for alerts defining information elements.</li><li>• Localities to include warnings on websites and social media venues.</li><li>• Seek feedback on effectiveness of alerts from localities and public (during surveys or other planning processes).</li></ul>	Short-term	\$	M

Recommendation			Action Steps	Timeframe	Cost	Staffing
	2.2	Re-structure and expand the Installation-Community Council (ICC) to include local businesses, residents, installation employees, non-profits, etc., to serve as a citizen group designed to promote positive community and installation relations and to help organize and sponsor events and activities and support economic development.	<ul style="list-style-type: none"><li>• ESC to evaluate ICC membership and redefine membership to accomplish intent of strategy.</li><li>• Hold ICC meeting.</li><li>• Establish leadership and purpose of ICC and carry out activities.</li></ul>	Mid-term	\$	L
	2.3	Update locality websites to recognize the installation, its mission, its location, links to the installation web page, contact information for key personnel, and fire warning orders. Update installation website to include more information about operations, training, noise impacts and complaint procedures, avoidance areas and key points of contact.	<ul style="list-style-type: none"><li>• Update community websites with links to Fort A.P. Hill key personnel contact information, fire warning orders, and noise reporting procedures.</li><li>• Update installation website with locality links, fire warning orders, property claims process, noise impacts and complaint procedures and contacts, and avoidance areas.</li></ul>	Mid-term	\$\$	M
Economic Dev.	3.1	Support Fort A.P. Hill’s pursuit of establishing Washington-Baltimore-Northern Virginia General Schedule (GS) pay grades for all personnel stationed at the installation.	<ul style="list-style-type: none"><li>• Fort A.P. Hill to pursue pay grade issue with the U.S. Office of Management and Budget.</li><li>• Localities to write letters of support.</li></ul>	Short-term	\$	M
Utilities	4.1	Coordinate extension of broadband / telecommunication services to better serve the communities around the installation.	<ul style="list-style-type: none"><li>• Develop a ESC subcommittee to focus on broadband issues and to coordinate services.</li></ul>	Long-term	\$\$	M
Community Development / Planning	5.1	Support real estate disclosure for prospective buyers or renters as part of real estate transactions for properties within the influence area and as part of subdivision plats.	<ul style="list-style-type: none"><li>• ESC to work with Fredericksburg Area Association of Realtors (FAAR) to develop a basic disclosure statement for the influence area and an amended point of sale document that includes disclosure.</li><li>• Support FAAR in their pursuit of enabling legislation for noise disclosure.</li><li>• Consider incorporating a statement on subdivision plats regarding proximity to the installation and potential for noise.</li></ul>	Mid-term	\$\$	M
	5.2	Encourage sound attenuation for new construction of residences, schools, hospitals, nursing homes, churches and other buildings with public gathering spaces.	<ul style="list-style-type: none"><li>• Study the costs and benefits of sound attenuation and use outcome to determine if pursuit of State Code amendment is desired.</li><li>• Utilize the proffer system or special use permit requirements to achieve higher sound attenuation standards.</li><li>• Consider the development of model sound attenuation standards for new construction.</li><li>• Incorporate attenuation practices into standard subdivision and plan review processes.</li></ul>	Mid-term	\$\$	M



Recommendation			Action Steps	Timeframe	Cost	Staffing
	5.3	Consider developing a model 'Dark Skies' Ordinance that sets forth specific requirements for lighting. Consider applying the ordinance county and town-wide for all 6 JLUS communities. Incorporate input from Fort A.P. Hill.	<ul style="list-style-type: none"> <li>Localities to develop dark skies ordinance (using input from the installation).</li> <li>Incorporate lighting best practices into standard subdivision and plan review processes.</li> <li>Provide information to utility providers regarding requirements.</li> </ul>	Mid-term	\$\$	M
	5.4	Develop a voluntary sound attenuation and lighting retrofit program for existing noise sensitive uses and high-demand lighting uses (such as sports complexes). Investigate federal or state funds to offset potential retrofit costs.	<ul style="list-style-type: none"> <li>ESC to jointly conduct a feasibility study for a residential sound and lighting retrofit program.</li> <li>Identify potential retrofit candidates</li> <li>Research funding sources.</li> </ul>	Long-term	\$\$	M

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## 6.0 King George County

### 6.1 Community Profile

King George County is located northeast of Fort A.P. Hill. The county is approximately 83 miles south of Washington, D.C. and 60 miles north of Richmond and is considered the entrance to the Northern Neck, bounded by the Potomac River to the north and the Rappahannock River to the south. While the installation does not share a border with the county, noise from its operations can be heard in King George County (see Chapter 8.0, Fort A.P. Hill). King George County is primarily rural and development is focused in the Court House and Dahlgren areas.

The southern portion of King George County that lies closest to Fort A.P. Hill is characterized by rural/agriculture land uses and scattered industrial uses. The industrial land uses consist of gravel mining operations along the Rappahannock River. The rural/agriculture land uses often include single family homes.

### 6.2 Current Tools and Programs

#### 6.2.1 Comprehensive Plan and Future Land Use

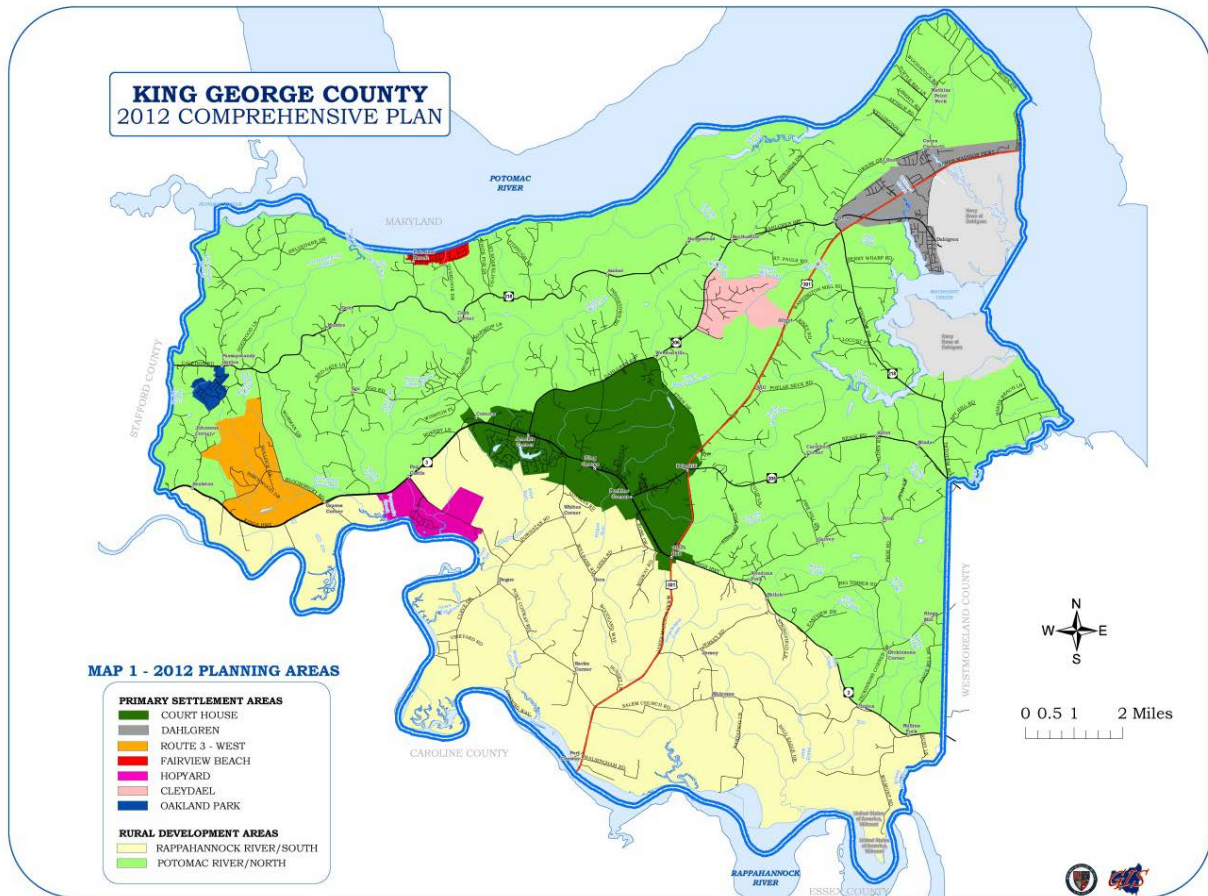
The 2013 King George County Comprehensive Plan defines two types of planning areas: primary settlement areas and rural development areas. Primary settlement areas are targeted for utility expansions, and future development and rural development areas are intended to preserve the county's rural and agricultural landscape. The primary settlement areas outlined in the comprehensive plan are located in central King George County, roughly eight miles from the perimeter of Fort A.P. Hill. The land in King George County within two to three miles of Fort A.P. Hill is defined as the Rappahannock River / South rural development area (See Figure 6.1). As a rural development area, utility expansion and development are not encouraged in this portion of King George County.

#### 6.2.2 Zoning

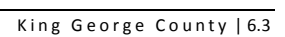
The land in King George County within two to three miles for Fort A.P. Hill is currently zoned for industrial (I) and agricultural (A-1) land uses (See Figure 6.2). This land is east of Fort A.P. Hill, across the Rappahannock River. Sand and gravel extraction and processing industry are permitted with special exception within the Industrial district along with a number of other permitted by right uses such as light manufacturing and retail commercial. The A-1 district is intended to preserve the rural agricultural character of the county and lot sizes must achieve a minimum of 10 acres. Sand and gravel extractions are permitted through special exception in the A-1 zone. There are no water and sewer expansions planned within the A-1 district.

#### 6.2.3 Infrastructure Plans

There are currently no major infrastructure plans for the area of King George County near Fort A.P. Hill.



**Figure 6.1** King George County Growth Areas  
Source: King George County, 2012



**Figure 6.2** King George County Zoning Map  
Source: King George County, 2013

## 6.3 Challenges and Opportunities

### 6.3.1 Challenges

- **Large Weaponry and Demolitions Noise.** Noise associated with large caliber weapons and demolition training activities extends into King George County. The type of noise is expressed by C-weighted Day-Night Level (CDNL) noise contours on Fort A.P. Hill noise contour maps and in peak noise contours that measure single events. Nearly 670 acres of land area within the county falls within the 57-62 CDNL zone, which the installation identifies as a Land Use Planning Zone (LUPZ). The peak noise contours associated with large weapons encompass a slightly larger portion of southern King George County, with approximately 1,439 acres of land area falling within the 115 dBP contour. Although the majority of land in this portion of the county is rural/agricultural, the installation has received several noise complaints originating from King George County related to large weapons training operations.
- **Rotary Aircraft Noise.** While the majority of operational aircraft noise is experienced in closer proximity to the installation, Fort A.P. Hill rotary aircraft operations also occur along the northern installation boundary, with noise impacts occasionally extending into King George County. Complaints originating in the county related to aircraft noise have been very few in number.
- **Air Pollution.** Fort A.P. Hill conducts prescribed burning in support of forest management activities on training lands. Controlled burns have caused smoke and dust impacts in the communities surrounding the installation, including King George County. Concerns exist regarding the potential for localized health impacts from the smoke and pollutant emissions associated with the burns and potential release of harmful particulates. Similar concerns also exist with the detonation of explosives.
- **Water Supply and Quality.** The county and surrounding communities rely upon groundwater for drinking water supply. Concerns exist about whether toxic releases from operations at the installation are affecting groundwater today or could in the future. Fort A.P. Hill is the largest contributor of toxic releases in Caroline County and has a fully implemented environmental management program and strong environmental compliance record.<sup>1</sup> This issue is further amplified by oil and gas exploration activities, like hydraulic fracking, that may occur on private lands in the area.
- **Training on the Rappahannock River.** The U.S. Army and/or tenants at Fort A.P. Hill have at times in the past used the Rappahannock River for training, though this type of activity has not occurred recently. Concerns exist about future use of the river corridor for training activities and any associated noise or safety issues that could arise.

### 6.3.2 Opportunities

- **Formalized Coordination.** An ongoing implementation body or committee that meets on a regular basis to share information on mission or community land use changes, monitor implementation progress, and revisit longer-term strategies can be an effective mechanism for collaboration. For example, a Memorandum of Understanding (MOU), when pursued in conjunction with an implementation body, can address protocols for communication and information exchange.

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<sup>1</sup> Virginia DEQ, 2011 Virginia Toxics Release Inventory Report, 2013.

- **Coordinated Development Reviews.** The County routinely shares Board of Supervisors’ meeting agendas with Fort A.P. Hill and welcomes ongoing communication efforts by the installation to share information about operations. Certain areas of the county along the Rappahannock River are more directly impacted by installation activities than others and increased efforts to share information about operations in those areas will help residents anticipate impacts. In addition, providing Fort A.P. Hill an opportunity to review development activities along the river could help lead to mutually beneficial outcomes for the county and the installation.
- **Reduce Noise Impacts through Land Use Process.** Proffered commitments to address noise attenuation, lighting, and/or other measures as part of rezoning applications, subdivision approvals for new development, or subdivision regulations could raise awareness about nearby military operations and help reduce noise impacts on future residents. In addition, a noise disclosure statement at a property point of sale or lease agreement may make buyers and renters more directly aware of potential impacts. For example, the State of Maryland and the Southern Maryland Association of Realtors have taken steps to address noise impacts, including those at Naval Surface Warfare Center Dahlgren located in King George County. An addendum to the Maryland State contract briefly describes the potential impacts and associated operations that can be expected near certain installations. The buyer retains responsibility to ascertain potential noise and accident probabilities. A similar addendum could be developed to address Fort A. P. Hill.
- **Reduce Noise Impacts through Voluntary Programs.** New residents are typically less familiar with the noise impacts of the nearby installation. Voluntary programs to reduce noise impacts in new buildings through sound attenuation and making buyers aware of nearby operations could help reduce future conflicts.

## 6.4 Recommendations

Based on feedback received from King George County, this section establishes a set of recommended actions for the county to consider that could strengthen coordination between the county and the installation. The recommendations are organized into the categories described below.

- **Coordination** – to facilitate coordination between King George County and Fort A.P. Hill.
- **Communication** – to improve the dissemination of locality and military operational information.
- **Economic Development** – to foster economic development opportunities in King George County.
- **Utilities** – to evaluate opportunities for improved broadband services around Fort A.P. Hill.
- **Community Development/Planning** – to reduce noise and vibration impacts on residents.

Each recommendation includes action steps, a timeframe, rough order magnitude of costs and staffing requirements.

- **Timeframe.** Identifies when the proposed recommendation should be initiated using one of three timeframe categories:
  - **Immediate (highest priority)** Now
  - **Short-term (high priority)** Less than one year
  - **Mid-term (moderate priority)** Between one and four years
  - **Long-term (lower priority)** More than four years

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- **Order of Magnitude Cost.** Provides a high level, Rough Order-of-Magnitude (ROM) cost impact for local jurisdictions and the installation to implement the strategy. Costs do not consider efforts undertaken by other parties beyond the JLUS partners.
  - \$ = < \$100,000
  - \$\$ = \$100,000 - \$300,000
  - \$\$\$ = > \$300,000
- **Potential Staffing Requirements.** Provides an estimate of the potential required staff involvement and staff time of local jurisdictions and/or Fort A.P. Hill to implement the recommendation. Staffing requirements do not include efforts conducted by other parties.
  - **L** = minimum
  - **M** = moderate
  - **H** = high



Table 6.1 King George County JLUS Recommendations

Recommendation		Action Steps	Timeframe	Cost	Staffing
Coordination	1.1	<p>Through an executed MOU, work with the other JLUS partners to establish the Fort A.P. Hill Executive Steering Committee (ESC) including local elected officials and the Fort A.P. Hill Garrison Commander to discuss community, installation and other compatibility issues on a regular scheduled basis and to coordinate and collaborate on the following:</p> <ul style="list-style-type: none"> <li>• Capital improvement and infrastructure planning</li> <li>• Comprehensive plan and other planning document updates</li> <li>• Long-range planning for newly proposed missions and on-base facilities, recognizing mission-related operational security requirements exist</li> <li>• Environmental studies related to air and water quality impacts</li> <li>• Pursuit of joint funding for studies</li> </ul> <p>The ESC should include a Working Committee at the planning director level that will form subcommittees as necessary to explore specific issues and opportunities.</p>	Immediate	-	-
	1.2	<p>Continue to solicit input from Fort A.P. Hill as part of a technical review process on development related submittals and text amendments within the Fort A.P. Hill influence area.</p>	Short-term	\$	M
Communication	2.1	<p>Issue Fire Warning Orders (through Caroline Alert and other media and social network venues) of training activities that are non-routine and have the potential to be louder than normal, as well as controlled burn activities, including the proposed time and duration of aviation and ordnance operations.</p>	Short-term	\$	M

Recommendation			Action Steps	Timeframe	Cost	Staffing
	2.2	Re-structure and expand the ICC to include local businesses, residents, installation employees, non-profits, etc., to serve as a citizen group designed to promote positive community and installation relations and to help organize and sponsor events and activities and support economic development.	<ul style="list-style-type: none"> <li>• ESC to evaluate ICC membership and redefine membership to accomplish intent of strategy.</li> <li>• Hold ICC meeting.</li> <li>• Establish leadership and purpose of ICC and carry out activities.</li> </ul>	Mid-term	\$	L
	2.3	Update locality website to recognize the installation, its mission, its location, links to the installation web page, contact information for key personnel, and fire warning orders.	<ul style="list-style-type: none"> <li>• Update community websites with links to Fort A.P. Hill key personnel contact information, fire warning orders, and noise reporting procedures.</li> </ul>	Mid-term	\$\$	M
Economic Dev.	3.1	Support Fort A.P. Hill's pursuit of establishing Washington-Baltimore-Northern Virginia General Schedule (GS) pay grades for all personnel stationed at the installation.	<ul style="list-style-type: none"> <li>• Fort A.P. Hill to pursue pay grade issue with the U.S. Office of Management and Budget.</li> <li>• Localities to write letters of support.</li> </ul>	Short-term	\$	M
Utilities	4.1	Coordinate extension of broadband / telecommunication services to better serve the communities around the installation.	<ul style="list-style-type: none"> <li>• Develop a ESC subcommittee to focus on broadband issues and to coordinate services.</li> </ul>	Long-term	\$\$	M
Community Development / Planning	5.1	Support real estate disclosure for prospective buyers or renters as part of real estate transactions for properties within the influence area.	<ul style="list-style-type: none"> <li>• ESC to work with Fredericksburg Area Association of Realtors (FAAR) to develop a basic disclosure statement for the influence area and an amended point of sale document that includes disclosure.</li> <li>• Support FAAR in their pursuit of enabling legislation for noise disclosure.</li> </ul>	Mid-term	\$\$	M
	5.2	Encourage sound attenuation for new construction of residences, schools, hospitals, nursing homes, churches and other buildings with public gathering spaces.	<ul style="list-style-type: none"> <li>• Study the costs and benefits of sound attenuation and use outcome to determine if pursuit of State Code amendment is desired.</li> <li>• Utilize the proffer system or special use permit requirements to achieve higher sound attenuation standards.</li> <li>• Consider the development of model sound attenuation standards for new construction.</li> </ul>	Mid-term	\$\$	M
	5.3	Consider developing a model 'Dark Skies' Ordinance that sets forth specific requirements for lighting. Consider applying the ordinance county and town-wide for all 6 JLUS communities. Incorporate input from Fort A.P. Hill.	<ul style="list-style-type: none"> <li>• Localities to develop dark skies ordinance (using input from the installation).</li> <li>• Incorporate lighting best practices into standard subdivision and plan review processes.</li> <li>• Provide information to utility providers regarding requirements.</li> </ul>	Mid-term	\$\$	M

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Recommendation			Action Steps	Timeframe	Cost	Staffing
	5.4	Develop a voluntary sound attenuation and lighting retrofit program for existing noise sensitive uses and high-demand lighting uses (such as sports complexes). Investigate federal or state funds to offset potential retrofit costs.	<ul style="list-style-type: none"><li>• ESC to jointly conduct a feasibility study for a residential sound and lighting retrofit program.</li><li>• Identify potential retrofit candidates</li><li>• Research funding sources.</li></ul>	Long-term	\$\$	M

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## 7.0 Spotsylvania County

### 7.1 Community Profile

Spotsylvania County is approximately equidistant from Richmond and Washington, D.C. and is one of the fastest growing counties in Virginia. The County's location along Interstate 95 (I-95), proximity to major urban centers and a high quality of life contribute to the area's growth and popularity. Based on U.S. Census Bureau data, the county experienced a growth rate of 113% between 1990 and 2010 and by 2010 maintained a population of 122,397. Population estimates as of July 1, 2012 are 125,684.<sup>1</sup> The Weldon Cooper Center for Public Service's population projections suggest that the County will add 101,520 residents or grow by 83 percent between 2010 and 2030. This projection assumes an average growth rate of approximately 3 percent per year, similar to a historic rate of approximately 3 percent between 2000 and 2010.<sup>2</sup>

A large portion of the county's growth is located along the I-95 and U.S. Route 1 corridors and although suburban style development has increased in the past decade, the county's 407 square miles are primarily rural and agricultural with rolling hills and forests. Fort A.P. Hill is located southeast of Spotsylvania County. Even though the county does not share a border with the installation, aviation operations associated with training do impact Spotsylvania County.

### 7.2 Current Tools and Programs

#### 7.2.1 Comprehensive Plan and Future Land Use

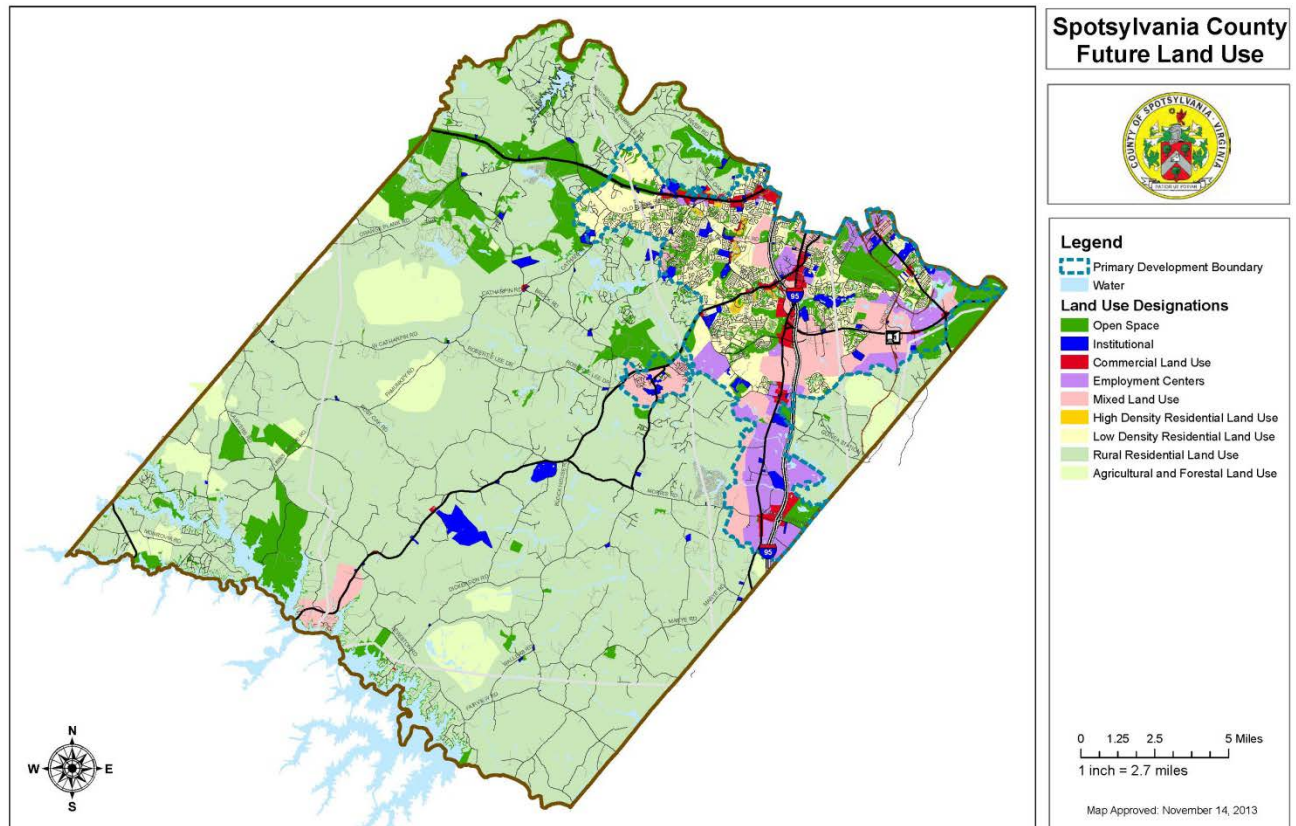
The Spotsylvania County Comprehensive Plan, adopted in 2013, includes a Future Land Use Map to guide land development. The plan outlines several objectives, including:

- Plan for the orderly development of the County.
- Promote a diverse and vibrant economic base.
- Maximize the use of existing infrastructure and public facilities to ensure the most efficient operation of facilities and the provision of services.
- Accommodate projected residential growth in a manner that is fiscally responsible.
- Strive for safe and affordable housing for people of all ages.
- Ensure land use policies recognize and accommodate anticipated population increases.
- Encourage a community service sector and a commercial base that meets the needs of the citizens and businesses in Spotsylvania County.

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<sup>1</sup> Spotsylvania County, Virginia, Comprehensive Plan, Adopted November 2013, Chapter 1: Introduction and Vision.

<sup>2</sup> Spotsylvania County, Virginia, Comprehensive Plan, Adopted November 2013, Chapter 1: Introduction and Vision.



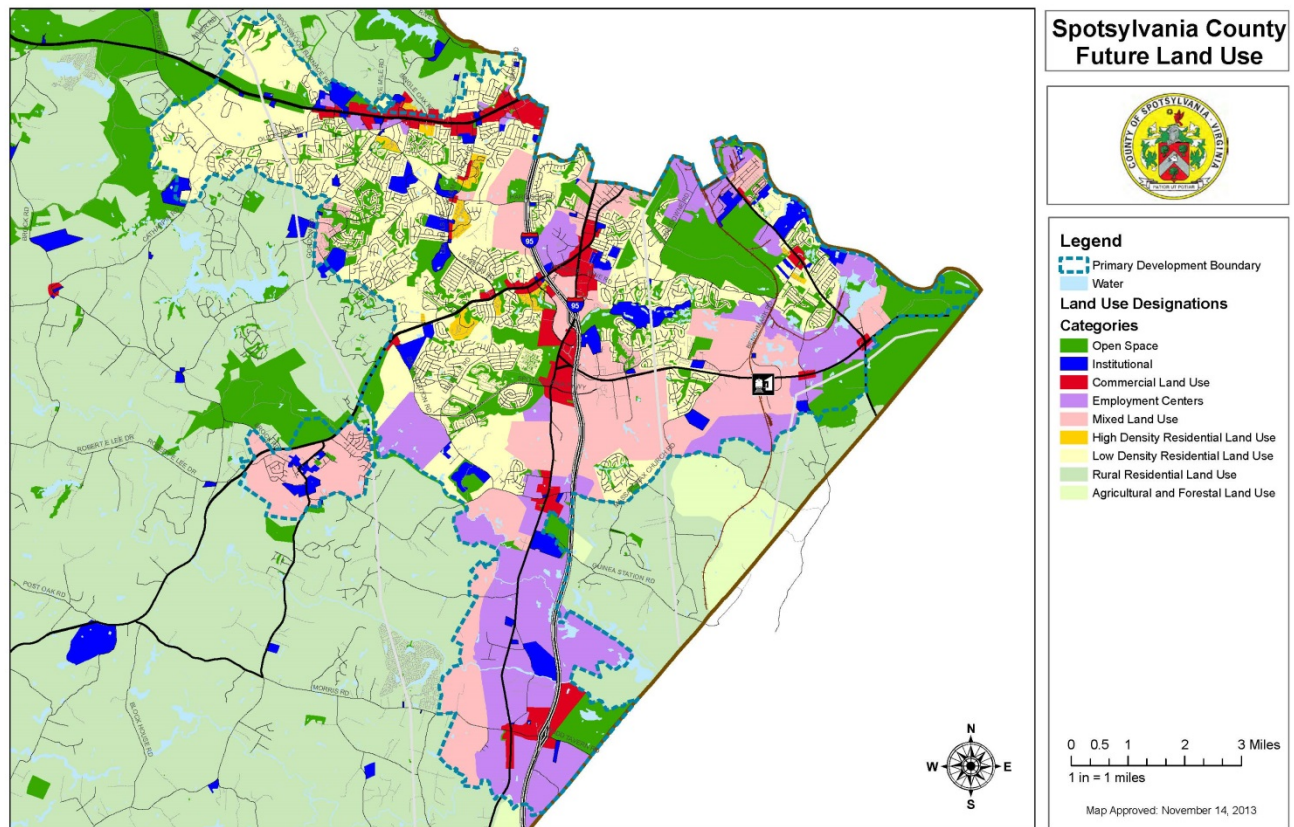
**Figure 7.1** Spotsylvania County Future Land Use Map  
Source: Spotsylvania County Comprehensive Plan, 2013

Spotsylvania County has a primary development boundary, which defines a public water and sewer service area, that aligns with the county’s growth strategy. Spotsylvania’s growth areas are concentrated around the City of Fredericksburg and along I-95. The primary development boundary is intended to contain development within the primary development district and preserve rural and agricultural lands.

The land in Spotsylvania that is two to three miles from Fort A.P. Hill falls both within and outside of the primary development boundary. Some of this area is under the Fort A.P. Hill Tier I and Tier II approach fans (see Chapter 8 for operational descriptions of Fort A.P. Hill); therefore, the future land use plan recommends a policy to “provide Fort A.P. Hill an opportunity to comment on rezoning proposals within the Fort A.P. Hill Approach Fan”<sup>3</sup> and recommends that rezoning proposals including residential development include “proffered commitments to noise attenuation, real estate disclosures, and/or other measures recommended by Fort A.P. Hill.”<sup>4</sup>

<sup>3</sup> Spotsylvania County, Virginia, Comprehensive Plan, Adopted November 2013, Amended February 22, 2011, Chapter 2: Future Land Use Element.

<sup>4</sup> *ibid.*



**Figure 7.2** Northeast Focus Area - Spotsylvania County Future Land Use Map

Source: Spotsylvania County Comprehensive Plan, 2013

The land closest to Fort A.P. Hill lies outside of the Primary Development Boundary and is designated as rural residential, open space, and agricultural and forestal land uses. The rural residential district is intended to conserve rural character while also accommodating large lot residential and cluster developments. The open space land use includes conserved lands and park and recreation facilities. The agricultural and forestal land use includes active agricultural land. Land within the primary development boundary, located in the northeastern portion of Spotsylvania County, is intended to be developed in a series of mixed-use communities and include significant employment centers. The county is actively encouraging a mix of residential, commercial, and office development, including a transit-oriented development within this district. Generally, northeast of these areas is a significant concentration of suburban residential developments. The future land use plan outlined in the Comprehensive Plan calls for mixed-use and employment center land uses in the portion of the primary development district that is closest to Fort A.P. Hill. According to the Comprehensive Plan, the mixed land use category is defined as permitting “traditional neighborhood; higher density residential; commercial uses (retail and office); light industrial; educational facilities; recreation facilities and compatible public and other civic facilities.”<sup>5</sup> The employment center category includes office, industrial and commercial land uses.

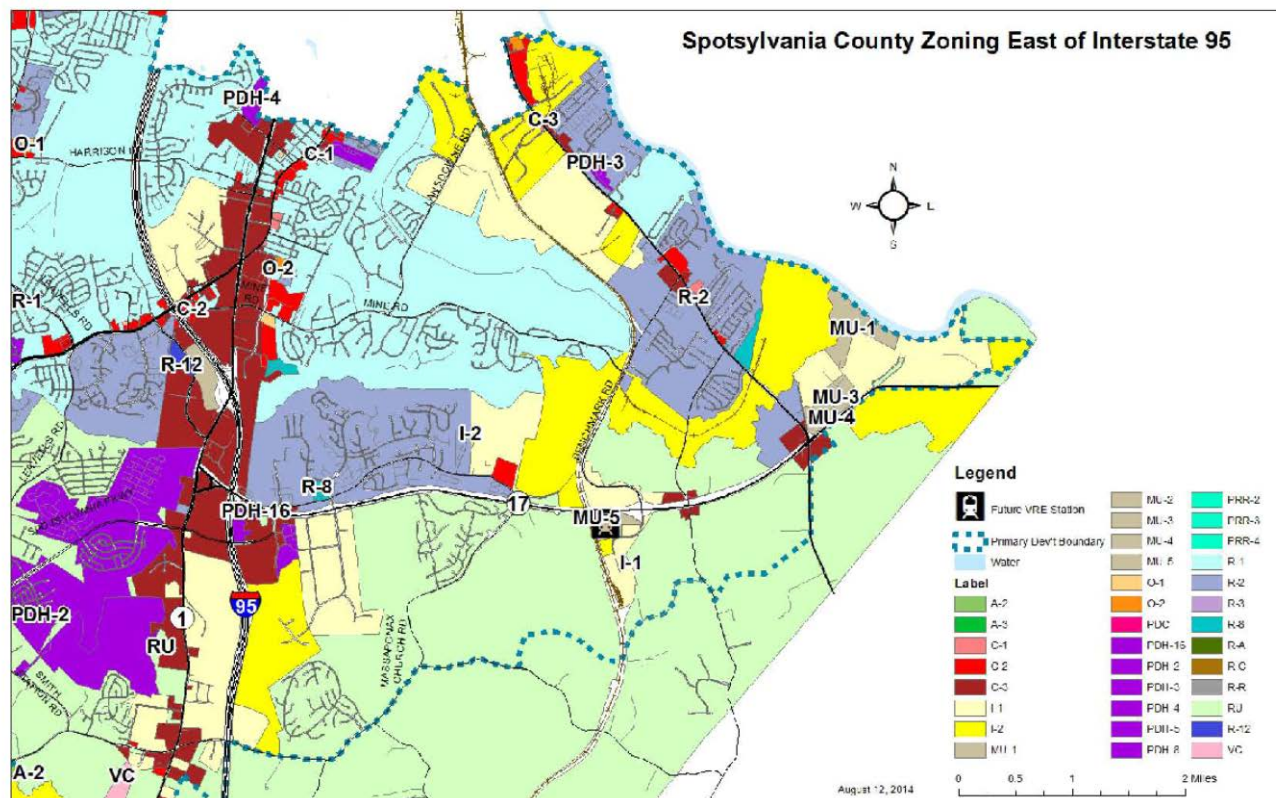
<sup>5</sup> ibid.



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### 7.2.2 Zoning

The county land closest to Fort A.P. Hill is currently zoned for mixed use (MU), commercial (C-3), industrial (I-1 and I-2), and rural (RU) land uses (See Figure 7.3). The MU district allows for a mix of uses in a compact, walkable community. The C-3 district permits general commerce activity. The I-1 district permits light industrial uses and the I-2 district permits medium and heavy industrial uses. The RU district permits agriculture, single-family detached (one dwelling unit per three acres), wildlife sanctuaries, public uses, parks, places of worship, and schools. Zoning within the primary development district, including those areas within the installation's approach fan, is likely to change over the next several years to align with the future land use plan.



**Figure 7.3** Northeast Focus Area - Spotsylvania County Zoning

Source: Spotsylvania County, August 2014

### 7.2.3 Infrastructure Plans

Spotsylvania County has several infrastructure plans near Fort A.P. Hill to encourage growth within its primary settlement district. The county has already extended water and sewer service along Route 2 and U.S. Route 17 to the undeveloped land within the primary development boundary. At this time, the county does not plan to extend water and sewer infrastructure further toward Fort A.P. Hill due to topography constraints which would require cost-prohibitive pumping.<sup>6</sup>

<sup>6</sup> Interview with Spotsylvania County, October 23, 2012.

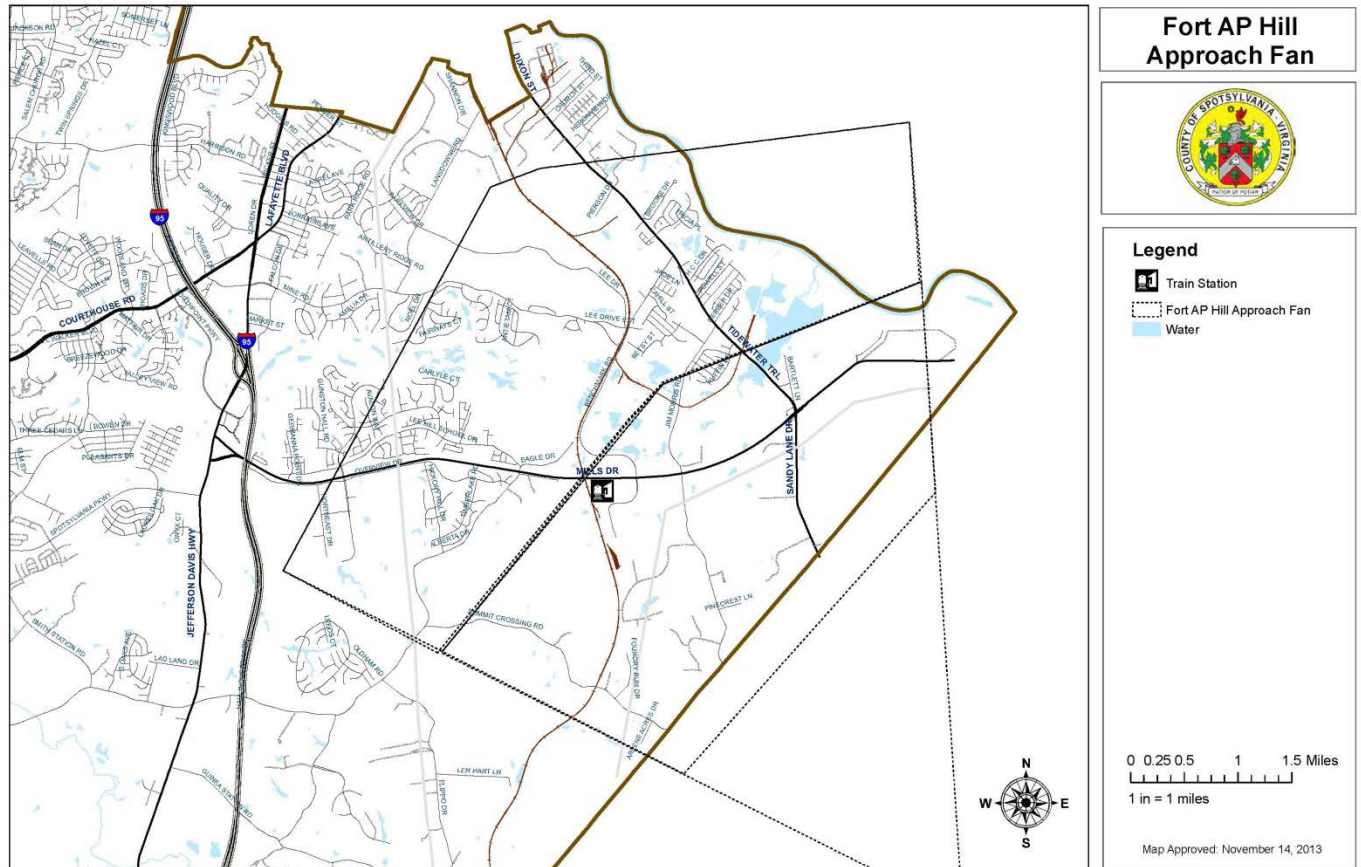
Several transportation projects are underway or planned to alleviate congestion and extend transit as identified in the 2040 Long Range Transportation Plan (LRTP) prepared by FAMPO and GWRC. Two projects on the LRTP short-list of critical transportation projects are in Spotsylvania County near Fort A.P. Hill: widening Route 2 from the Spotsylvania-Fredericksburg border to the intersection with U.S. Route 17 and widening U.S. Route 17 from I-95 to the Spotsylvania-Caroline County border. The Route 2 widening project is unfunded and listed for funding in the 2036-2040 cycle. The U.S. Route 17 widening project is unfunded and listed for funding in the 2026-2030 cycle.

In addition to the roadway expansions, new transit service is coming to Spotsylvania County. The Virginia Railway Express is constructing a new station within the Crossroads Station development south of Route 17. This station will be completed in 2015 and will fall under the Tier I approach fan.

### 7.3 Challenges and Opportunities

#### 7.3.1 Challenges

- **Aircraft Noise.** A wide range of aviation training occurs at Fort A.P. Hill, including fixed wing and rotary aircraft operations. The Assault Landing Zone (ALZ) facility, which is located in the northwestern portion of the installation, has two associated approach (take-off and landing) fans that correspond to approximate noise zones and altitudes of fixed wing aircraft that use the ALZ (See Chapter 8.0, Fort A. P. Hill). Approaches to the ALZ can range from 300 to 1,000 feet above ground level and the majority of takeoffs and landings occur to the northwest of the ALZ, over Spotsylvania County. Once in flight, aircraft often follow racetrack patterns that extend slightly into Spotsylvania County. The fans were developed by the installation in absence of official noise contours since the number of flights is not high enough to warrant contours. The inner-most fan (closest to the installation) represents altitudes less than 1,700 feet above ground level (AGL) and noise levels approaching 80 dBA. The outer fan represents altitudes between 1,700 and 3,500 feet AGL and noise levels below 80 dBA. While average noise levels in the fan areas are anticipated to be below typical airfields, there is a potential for individual overflights to generate undesirable noise levels on current and future development. Aviation noise complaints have been documented in and around the fan areas of Spotsylvania County. In addition, rotary aircraft routes exist around the perimeter of the installation and are in close proximity to the county boundary.
- **Aircraft Training Routes Overlap with County Investment Priorities** Spotsylvania County has identified growth areas and infrastructure investment priorities along the U.S. Route 17 and Route 2 corridors that are located in relatively close proximity to training areas on Fort A.P. Hill. This area of the county has been the recipient of utility and roadway infrastructure improvements geared toward supporting higher density mixed use development and recent re-zonings in the area have been consistent with the county's growth goals for the area. The northern approach fan for the ALZ covers a portion of the county's growth area as shown in Figure 7.4.
- **Fort A.P. Hill Night-time Operations Require Dark Skies.** Fort A.P. Hill conducts night-time training operations that utilize night vision equipment. The success of night-time operational activities is dependent upon dark conditions that are affected by ambient light levels. Night vision training occurs at the Laser Range near U.S. Route 17 and at the ALZ and Drop Zone. As Spotsylvania County grows, the installation is concerned that new development within the county's growth area may generate night-time illumination that will compromise the installation's ability to implement its night-time training operations.



**Figure 7.4** Fort A.P. Hill Approach Fan

Source: Spotsylvania County Comprehensive Plan, 2013, Appendix

### 7.3.2 Opportunities

- Integration of the Fort A.P. Hill Operational Area Into Planning Policy.** Spotsylvania County has already recognized the installation's operations in its future plans by recognizing and including the installation's Approach Fans in the county's Comprehensive Plan. The fans are part of a larger operational area (see Chapter 8.0, Fort A.P. Hill) in which Fort A.P. Hill conducts training.
- Coordinated Development Reviews.** Spotsylvania County and Fort A.P. Hill have established effective procedures for communication. For example, the county provides the installation an opportunity to comment on proposed re-zonings within the approach fans. Continued open dialogue will help develop mutually beneficial outcomes for the county and the installation.
- Reduce Noise Impacts.** Proffered commitments to noise attenuation, real estate disclosures, and/or other measures recommended by Fort A.P. Hill as part of rezoning applications could help mitigate against future noise complaints in the county's growth area. The installation has expressed concerns about increased residential density in Spotsylvania County that could lead to an increase in noise complaints and pressure to modify training operations. The county has had success in obtaining lighting controls and sound attenuation for recent rezoning applications and is actively working with the installation on these issues to minimize the impacts of development on its mission.

- **Develop a Dark Skies Ordinance.** Adoption of a county-wide dark skies ordinance would put in place lighting controls and requirements on new development county-wide and would help alleviate the installation's concerns about increased light pollution. Fort A.P. Hill should work with the county to ensure adequate lighting requirements and standards are captured in the ordinance.

### 7.4 Recommendations

Based on feedback received from Spotsylvania County, this section establishes a set of recommended actions for the county to consider that could strengthen coordination between the county and the installation. The recommendations are organized into the categories described below.

- **Coordination** – to facilitate coordination between Spotsylvania County and Fort A.P. Hill.
- **Communication** – to improve the dissemination of locality and military operational information.
- **Economic Development** – to foster economic development opportunities in Spotsylvania County.
- **Utilities** – to evaluate opportunities for improved broadband services around Fort A.P. Hill.
- **Community Development/Planning** – to reduce noise and vibration impacts on residents.

Each recommendation includes action steps, a timeframe, rough order magnitude of costs and staffing requirements.

- **Timeframe.** Identifies when the proposed recommendation should be initiated using one of three timeframe categories:
  - **Immediate (highest priority)** Now
  - **Short-term (high priority)** Less than one year
  - **Mid-term (moderate priority)** Between one and four years
  - **Long-term (lower priority)** More than four years
- **Order of Magnitude Cost.** Provides a high level, Rough Order-of-Magnitude (ROM) cost impact for local jurisdictions and the installation to implement the strategy. Costs do not consider efforts undertaken by other parties beyond the JLUS partners.
  - **\$** = < \$100,000
  - **\$\$** = \$100,000 - \$300,000
  - **\$\$\$** = > \$300,000
- **Potential Staffing Requirements.** Provides an estimate of the potential required staff involvement and staff time of local jurisdictions and/or Fort A.P. Hill to implement the recommendation. Staffing requirements do not include efforts conducted by other parties.
  - **L** = minimum
  - **M** = moderate
  - **H** = high

Table 7.1 Spotsylvania County JLUS Recommendations

Recommendation			Action Steps	Timeframe	Cost	Staffing
Coordination	1.1	<p>Through an executed MOU, work with the other JLUS partners to establish the Fort A.P. Hill Executive Steering Committee (ESC) including local elected officials and the Fort A.P. Hill Garrison Commander to discuss community, installation and other compatibility issues on a regular scheduled basis and to coordinate and collaborate on the following:</p> <ul style="list-style-type: none"><li>• Capital improvement and infrastructure planning</li><li>• Comprehensive plan and other planning document updates</li><li>• Long range planning for newly proposed missions and on-base facilities, recognizing mission-related operational security requirements exist</li><li>• Environmental studies related to air and water quality impacts</li><li>• Pursuit of joint funding for studies</li></ul> <p>The ESC should include a Working Committee at the planning director level that will form subcommittees as necessary to explore specific issues and opportunities.</p>	<ul style="list-style-type: none"><li>• Agree upon key communication procedures contained in the draft MOU and identify primary internal points of contact to produce and receive notices.</li><li>• Identify appropriate secondary partners for participation in the MOU.</li><li>• Sign the MOU.</li><li>• Define issues to review and information to share.</li><li>• Exchange information about upcoming infrastructure studies and plans.</li><li>• Modify planning processes to include opportunity for installation/community input early on - before development of alternatives and as part of benefits/impacts review.</li><li>• Involve utilities and public works personnel in discussions.</li><li>• Explore ways to include the installation in any sub committees that are formed for plan updates (i.e. transportation, utilities, etc.).</li><li>• Fort A.P. Hill to hold regular meetings/briefings with locality representatives during plan/project developments.</li></ul>	Immediate	-	-
	1.2	<p>Continue to solicit input from Fort A.P. Hill as part of a technical review process on development related submittals and text amendments within the Fort A.P. Hill influence area.</p>	<ul style="list-style-type: none"><li>• Formalize Fort A.P. Hill as a technical review committee member or similar status and define consultation procedures to obtain installation input</li><li>• Seek input from the installation on all development related proposals and text amendments and consider the input in decision-making processes.</li><li>• Fort A.P. Hill provides written input on development related proposals and text amendments.</li></ul>	Short-term	\$	M
Communication	2.1	<p>Issue Fire Warning Orders (through Caroline Alert and other media and social network venues) of training activities that are non-routine and have the potential to be louder than normal, as well as controlled burn activities, including the proposed time and duration of aviation and ordnance operations.</p>	<ul style="list-style-type: none"><li>• Fort A.P. Hill Public Affairs Officer (PAO) to define multiple media and social network outlets for alerts, including ESC and Installation Command Council (ICC).</li><li>• Develop template for alerts defining information elements.</li><li>• Localities to include warnings on websites and social media venues.</li><li>• Seek feedback on effectiveness of alerts from localities and public (during surveys or other planning processes).</li></ul>	Short-term	\$	M



Recommendation			Action Steps	Timeframe	Cost	Staffing
	2.2	Re-structure and expand the ICC to include local businesses, residents, installation employees, non-profits, etc., to serve as a citizen group designed to promote positive community and installation relations and to help organize and sponsor events and activities and support economic development.	<ul style="list-style-type: none"><li>• ESC to evaluate ICC membership and redefine membership to accomplish intent of strategy.</li><li>• Hold ICC meeting.</li><li>• Establish leadership and purpose of ICC and carry out activities.</li></ul>	Mid-term	\$	L
	2.3	Update locality websites to recognize the installation, its mission, its location, links to the installation web page, contact information for key personnel, and fire warning orders. Update installation website to include more information about operations, training, noise impacts and complaint procedures, avoidance areas and key points of contact.	<ul style="list-style-type: none"><li>• Update community websites with links to Fort A.P. Hill key personnel contact information, fire warning orders, and noise reporting procedures.</li><li>• Update installation website with locality links, fire warning orders, property claims process, noise impacts and complaint procedures and contacts, and avoidance areas.</li></ul>	Mid-term	\$\$	M
Economic Development	3.1	Support Fort A.P. Hill's pursuit of establishing Washington-Baltimore-Northern Virginia General Schedule (GS) pay grades for all personnel stationed at the installation.	<ul style="list-style-type: none"><li>• Fort A.P. Hill to pursue pay grade issue with the U.S. Office of Management and Budget.</li><li>• Localities to write letters of support.</li></ul>	Short-term	\$	M
	3.2	Using manning/training personnel data from the installation updated on a bi-annual basis, pursue commercial and retail uses off base that support on base employees and local visitors, tourists and residents.	<ul style="list-style-type: none"><li>• Fort A.P. Hill to establish a recurring data collection process to document training personnel numbers of partner groups and rotational units.</li><li>• Provide data to ESC on bi-annual basis.</li></ul>	Short-term	\$	M
Utilities	4.1	Coordinate extension of broadband / telecommunication services to better serve the communities around the installation.	<ul style="list-style-type: none"><li>• Develop a ESC subcommittee to focus on broadband issues and to coordinate services.</li></ul>	Long-term	\$\$	M
Community Development / Planning	5.1	Support real estate disclosure for prospective buyers or renters as part of real estate transactions for properties within the influence area and as part of subdivision plats.	<ul style="list-style-type: none"><li>• ESC to work with Fredericksburg Area Association of Realtors (FAAR) to develop a basic disclosure statement for the influence area and an amended point of sale document that includes disclosure.</li><li>• Support FAAR in their pursuit of enabling legislation for noise disclosure.</li><li>• Consider incorporating a statement on subdivision plats regarding proximity to installation and potential for noise.</li></ul>	Mid-term	\$\$	M
	5.2	Encourage sound attenuation for new construction of residences, schools, hospitals, nursing homes, churches and other buildings with public gathering spaces.	<ul style="list-style-type: none"><li>• Utilize the proffer system or special use permit requirements to achieve higher sound attenuation standards.</li><li>• Consider the development of model sound attenuation standards for new construction.</li><li>• Incorporate attenuation practices into standard subdivision and plan review processes.</li></ul>	Mid-term	\$\$	M

Recommendation			Action Steps	Timeframe	Cost	Staffing
	5.3	Consider developing a model 'Dark Skies' Ordinance that sets forth specific requirements for lighting. Consider applying the ordinance county and town-wide for all six JLUS communities. Incorporate input from Fort A.P. Hill.	<ul style="list-style-type: none"> <li>• Localities to develop dark skies ordinance (using input from the installation).</li> <li>• Incorporate lighting best practices into standard subdivision and plan review processes.</li> <li>• Provide information to utility providers regarding requirements.</li> </ul>	Mid-term	\$\$	M
	5.4	Develop a voluntary sound attenuation and lighting retrofit program for existing noise sensitive uses and high-demand lighting uses (such as sports complexes). Investigate federal or state funds to offset potential retrofit costs.	<ul style="list-style-type: none"> <li>• ESC to jointly conduct a feasibility study for a residential sound and lighting retrofit program.</li> <li>• Identify potential retrofit candidates.</li> <li>• Research funding sources.</li> </ul>	Long-term	\$\$	M

## 8.0 Fort A.P. Hill

### 8.1 Fort A.P. Hill Profile

#### 8.1.1 History

Fort A.P. Hill was established as an Army training facility in June 1941 as a maneuver area for mobilization of soldiers from Mid-Atlantic States during World War II. Camp A.P. Hill, as it was then known, remained an important training site throughout World War II, drawing Officer Candidate School students and enlistees from Forts Lee, Eustis, and Belvoir. The installation continued to serve as a training and staging location for the Korean War, Vietnam War, and Iraq and Afghanistan conflicts. The training tradition continues today for all branches of the Armed Forces.<sup>1</sup>

Fort A.P. Hill is an all-purpose Regional Collective Training Center, serving every component of the U.S. Armed Forces, active and reserve, and several agencies of the U.S. Government. Fort A.P. Hill is one of the largest East Coast installations and is the range and training center closest to the National Capital Region. The installation is the top-rated Army installation in Virginia in Base Realignment and Closure 2005 in terms of "Military Value." This ranking is associated with Fort A.P. Hill's ability to conduct realistic combat training for the joint force.

#### 8.1.2 Mission and Current Activities

Fort A.P. Hill is 76,000 acres in size and the largest military installation in Virginia, providing a diverse and realistic year-round training environment for maneuver and live fire training. The installation offers a 27,000 acre live-fire range with 40 ranges and 8 demolition training sites, 31 training and maneuvering areas covering 44,000 acres, including multiple training lanes, land navigation courses, and urban warfare training facilities.

While the permanent population at Fort A.P. Hill is only approximately 500 people, more than 90,000 troops representing hundreds of different units trained on site during fiscal year 2011.

As a training facility, Fort A.P. Hill supports a wide range of partner units. These groups represent both active duty and reserve functions within all branches of the Armed Forces, as well as other government agencies. The units that take advantage of the unique training environment at Fort A.P. Hill include the following:

**Night Vision & Electronic Sensors Directorate.** The Communications-Electronics Research, Development and Engineering Center, Night Vision and Electronic Sensors Directorate (CERDEC NVESD), headquartered at Fort Belvoir, Virginia, performs field equipment testing at Fort A.P. Hill. NVESD makes use of the Drop Zone, Laser Range, and a dedicated explosives training site for testing of equipment associated with helicopters, Unmanned Aerial Vehicles (UAVs), ground tactical vehicles, and landmine detection and elimination equipment.

**Naval Special Warfare Group 2 - U.S. Navy.** Naval Special Warfare Group 2 (NSWG-2), headquartered at Joint Expeditionary Base Little Creek-Fort Story, Virginia, utilizes Fort A.P. Hill for live fire and maneuver training opportunities for the SEAL Teams supported by the command. NSWG-2 has on occasion performed training exercises (blank fire) on the Rappahannock River via the Installation's access point at Hicks Landing.

**Asymmetric Warfare Group.** The Asymmetric Warfare Group (AWG), headquartered at Fort Meade, Maryland, provides training and advisory support to Army and Joint Force Units. AWG recently constructed a sophisticated

<sup>1</sup> Fort A.P. Hill Long Range Component, 2013



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new training complex at Fort A.P. Hill to support year-round enhanced urban operations, live fire training, and design of rapid solutions to current and emerging battlefield challenges.

**U.S. Army Explosive Ordnance Disposal Field Training Activity.** The U.S. Army Explosive Ordnance Disposal (EOD) Field Training Activity performs demolition training activities at Fort A.P. Hill. Student throughput at Fort A.P. Hill is currently between 800 and 900 students annually, in a combination of permanent and temporary duty statuses.

**Virginia Army National Guard (Armory).** Fort A.P. Hill supports training opportunities for Virginia Army National Guard units, including the following:

- Infantry Brigade Special Troops Detachment
- 91st Troop Command
- ARNG Recruiting & Retention Detachment
- HQ, DARC Mobilization CMD
- Det. 1, A Co, 429th Forward Support BN
- Virginia Defense Force

**U.S. Army Reserve.** The following U.S. Army Reserve units operate from two Reserve Centers on Fort A.P. Hill and actively train at the installation:

- 130th Chemical Company
- 377th Chemical Company (Combat Support)
- 1083rd Training Detachment 8
- 1st Battalion, 322nd Regiment
- 310th Multi-Role Bridge Company
- 99<sup>th</sup> Regional Readiness Sustainment Command, ECS - BMA

**U.S. Army Signal NETCOM (support activity).** U.S. Army Signal Network Enterprise Technology Command (NETCOM) provides information technology services for all Army network communications.

**Logistics Readiness Command (support activity).** The Logistics Readiness Command provides logistics support to warfighter and coalition forces to prepare, sustain, and reset armed forces before, during, and after combat operations and deployments.

Other important partner units include:

- Kenner Army Health Clinic
- Sustainable Range Program GIS Support Center
- Army Corps of Engineers Norfolk District Field Office
- Meteorological Team, Dugway Proving Ground
- U.S. Army Tank & Automotive Command (support detachment)
- Quartermaster School Warrior Training

### 8.1.3 Foreseeable Activities

Fort A.P. Hill will continue to support its current training mission while improving on facilities to meet the requirements of changing technology. This will include increasing capabilities in computerized exercises and training simulations, as well as enhancing automation of existing ranges and base support functions. While the

major types of training activities are not anticipated to change in coming years, the tempo of activity may increase to some degree as U.S. troops return home from abroad.

#### 8.1.4 Economic Impacts

Federal spending over the last several decades has helped build a robust economy in and around the Washington DC metropolitan region. The Fort A.P. Hill study area jurisdictions are part of two metropolitan statistical areas (MSA): northern Virginia (Spotsylvania County) and Richmond (Caroline County). The northern Virginia MSA has seen explosive growth as a result of federal spending and forecasts point to strong gains in population and employment in knowledge-based and technology-intensive sectors.<sup>2</sup>

Fort A.P. Hill and the communities that surround it are part of a broader, more extensive defense community region that includes Marine Corps Base Quantico and Naval Support Facility Dahlgren. The presence of three distinct military installations within the region solidifies the area's high military value and role in our nation's defense. Military installations provide varying degrees of direct and indirect economic impacts on an area's economy through jobs, services and expenditures. An economic impact study for Fort A.P. Hill, prepared by the Strategic Outreach Coordination Office at the installation in 2011, evaluated the installation's direct and indirect economic impacts for Virginia (not a specific locality) for fiscal year 2010 and addressed employment, visitors (for both training and recreational purposes), and expenditures associated with non-personnel related costs. The report was supported by technical experts in the School of Public Policy at George Mason and Director of the Center for Regional Analysis at George Mason. Findings referenced in this section are based on data in the FY 2011 report.

**Employees.** Fort A.P. Hill is unique in that it is a regional training center and is not home to a large number of permanently stationed troops. In FY 2011, Fort A.P. Hill employed 745 full and part time personnel, including two active duty personnel and 137 Reserve/National Guard personnel<sup>3</sup>. Only two percent of the installation's 745 personnel live on post. The permanent full-time population at the installation was estimated at 500 personnel<sup>4</sup>. The total annual payroll is calculated at approximately \$42.4 million (see Table 8.1).

Caroline County and Fort A.P. Hill are part of the Richmond federal locality pay area. Both are located just outside the Washington-Baltimore-Northern Virginia, DC-MD-VA-WV-PA locality pay area which offers higher locality pay levels. This has direct implications on

	Living On-Post	Living Off-Post	Payroll
Active Duty (includes full time Guard/Reserve)	2	37	\$2,596,487
Reserve/National Guard		137	\$1,700,000
Total Civilians (includes Appropriated General Schedule, Appropriated Fund Wage Grade, and Non-Appropriated Fund Civilians (including part time))*	15	414	\$31,523,717
Contract and Other Civilians (including part time)		111	\$4,601,482**
Private Business on post		29	\$2,015,000
<b>TOTALS</b>	<b>17</b>	<b>728</b>	<b>\$42,436,686</b>

**Table 8.1** Number of Personnel by Category

\*Includes temporary and term fulltime employees. \*\*Some service contract dollars also fund contract personnel. Source: Strategic Outreach Coordination Office, Fort A.P. Hill, Economic Impact Study Fort A.P. Hill, Fiscal Year 2011.

<sup>2</sup> Stephen Fuller, "The Future of the Northern Virginia Economy", 2011.

<sup>3</sup> Strategic Outreach Coordination Office, Fort A.P. Hill, Economic Impact Study Fort A.P. Hill, Fiscal Year 2011.

<sup>4</sup> Interview, Garrison Commander, October 2012.

employee salaries and is a perceived disadvantage considering a majority of Fort A.P. Hill's 'professional/technical' workforce lives within Spotsylvania and King George Counties and the City of Fredericksburg.<sup>5</sup>

**Transient and Temporary Duty Personnel.** Tens of thousands of transient training personnel visit the installation each year and calculating average direct expenditures of temporary duty throughput is difficult; training times and programs may or may not afford troops an opportunity for spending money on dining or traveling in the local area.

The average daily supported population at Fort A.P. Hill varies depending on the training missions taking place. While Fort A.P. Hill can accommodate 10,000 troops at any given time, typically there are 3,000 - 4,000 troops training on post per week in colder months and 5,000 – 6,000 troops training per week in warmer months.<sup>6</sup> In 2010, 89,150 personnel trained at Fort A.P. Hill and in 2011, 92,000 personnel trained at Fort A.P. Hill. Units typically train at the installation for one to two weeks but could be on-post for a month or longer. In 2010, temporary duty travelers utilized an estimated 16,240 nights of lodging. Total expenditures in FY 2010 for transient and temporary duty personnel associated with Fort A.P. Hill or the vicinity around the installation was calculated at \$6.8 million.<sup>7</sup>

**Construction, Services, Equipment and Materials.** The Capital Investment Strategy Component of Fort A.P. Hill's Real Property Master Plan states the installation will continue to focus on providing training ranges and facilities for all branches of the military, multiple federal agencies and local and state law enforcement agencies. The population is expected to remain largely transient, and the installation plans to expand and maintain support services for transients as a primary objective.

	Expenditures
Construction	\$32,931,394
Expenditures/Payment Benefitting State/Local Governments and Landowners	\$10,642,548
Services	\$17,515,810
Materials, Equipment and Supplies Procurement	\$27,368,576
<b>Total</b>	<b>\$88,458,328</b>

A number of recent projects have been completed that demonstrate a healthy amount of expenditures related to construction, services, equipment and materials. Fiscal year 2010 expenditures exceeded \$88 million (see Table 8.2). Recent investments include, but are not limited to, the Explosives Ordnance Disposal (EOD) School and Field Training facility (\$9M) and the Asymmetric Warfare Group Indoor Range and Complex (\$94M)<sup>8</sup>.

**Table 8.2** Construction, Services, Equipment and Materials Expenditures  
Source: Strategic Outreach Coordination Office, Fort A.P. Hill, Economic Impact Study Fort A.P. Hill, Fiscal Year 2011.

**Summary.** The total annual economic impacts of Fort A.P. Hill for the Commonwealth of Virginia, after application of multiplier factors by category of expenditure, are estimated to exceed \$240 million (see Table 8.3).

Fort A.P. Hill's regional training mission generates expenditures and jobs outside the Commonwealth of Virginia. For example, the installation manages food purchases for other Mid-Atlantic installation dining facilities, expends millions in ammunition inventory annually, and expends resources for the transportation and logistics associated with troop movements. These expenditures have national impacts that exceed \$78 million annually.

<sup>5</sup> Strategic Outreach Coordination Office, Fort A.P. Hill, Economic Impact Study Fort A.P. Hill, Fiscal Year 2011.

<sup>6</sup> Interview, Garrison Commander, October 2012.

<sup>7</sup> Strategic Outreach Coordination Office, Fort A.P. Hill, Economic Impact Study Fort A.P. Hill, Fiscal Year 2011.

<sup>8</sup> Garrison Overview Presentation, October 2012.

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	Aggregate Direct Outlay	Total Outputs	Personnel Earnings	Jobs Supported
Personnel Payroll	\$42,436,686	\$79,632,666	\$22,585,196	472
Transient and Temporary Duty	\$6,840,974	\$11,748,715	\$3,824,608	79.95
Construction, Services, Equipment and Materials	\$88,458,328	\$151,953,079	\$52,797,350	1,103.62
Total	\$137,735,988	\$243,334,460	\$79,207,154	1655.57

**Table 8.3** Total Estimated Economic Impacts

Source: Strategic Outreach Coordination Office, Fort A.P. Hill, Economic Impact Study Fort A.P. Hill, Fiscal Year 2011.

## 8.2 Operations and Tools

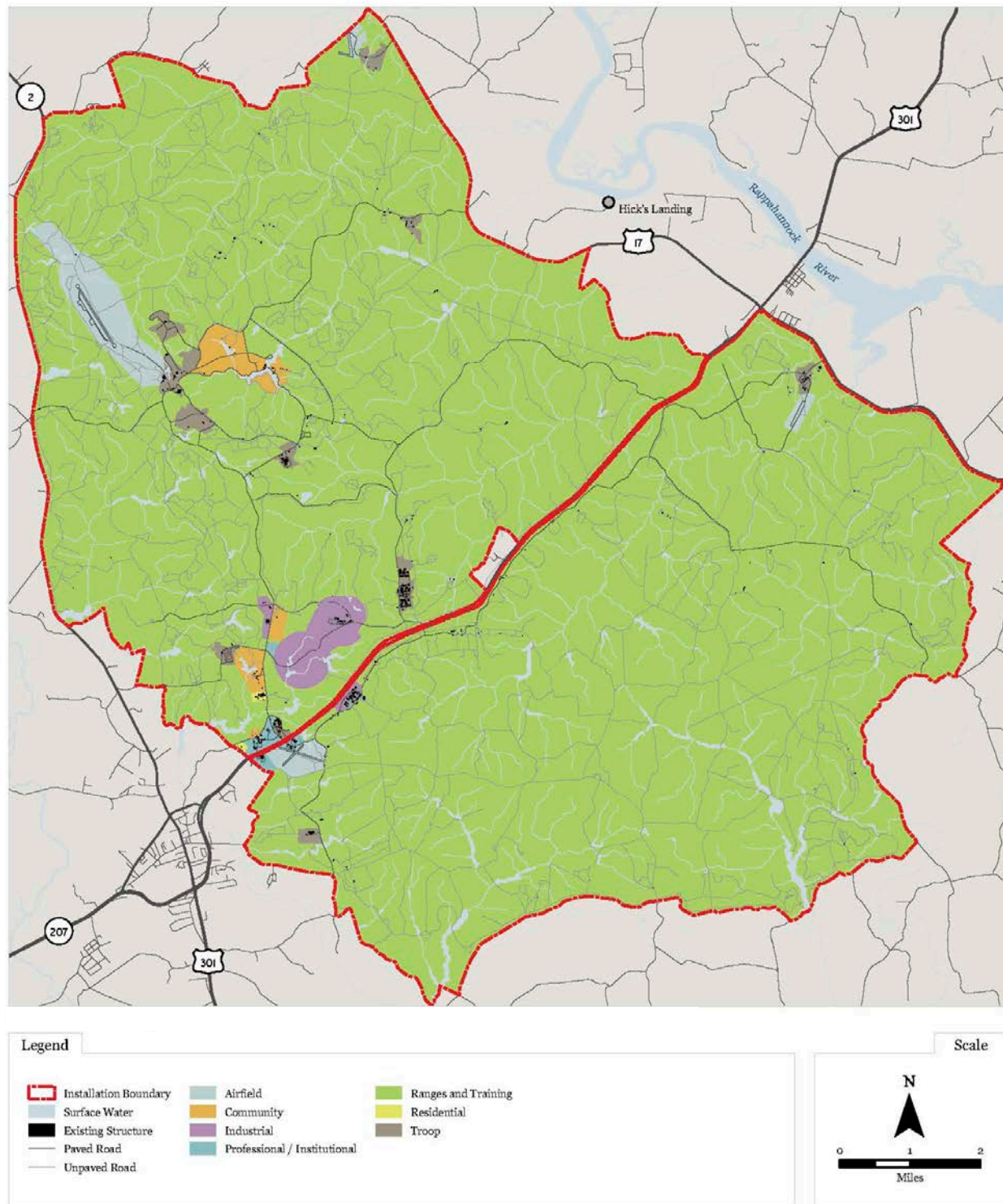
### 8.2.1 Functional Land Use

The Fort A.P. Hill Real Property Master Plan (RPMP) serves as the installation's internal comprehensive plan and provides both broad and specific strategies for the use of land, utilities, and facilities throughout the installation. The plan includes five components, including a Long Range Component and Capital Investment Strategy that together provide a framework and set of actions to address current demands and long-term facility needs. The plan assists base personnel in understanding existing conditions, constraints, and future expectations and identifies specific requirements and projects for implementation such as construction, demolition, renovation, conversion, facility reassignments, and real estate transactions.

The Fort A.P. Hill RPMP was finalized in January 2013. The plan defines a number of guiding principles, including several directly related to enhancing military-community relations:

- Develop a current and functional Joint Land Use Study (JLUS) to maintain cohesive development between the Post and Caroline County.
- Continuously re-evaluate the priorities of the Army Compatibility Use Buffer (ACUB) to guarantee the most up-to-date goals.
- Seek community input when siting new construction that would impact the surrounding communities.
- Evaluate opportunities for sharing resources and infrastructure capabilities to improve quality of life for all.
- Develop mutually beneficial relationships with the surrounding communities to promote growth near gate entrances.

The vast majority of the land area of Fort A.P. Hill is dedicated to its primary mission - training. As stated previously, the installation maintains a 27,000 acre live-fire range with 40 ranges and 8 demolition training sites, 31 training and maneuver areas covering 44,000 acres, including multiple training lanes, land navigation courses, and urban warfare training facilities. The training and maneuver areas provide opportunities for infantry, Special Operations, combat support/combat service support, and tactical convoy training. The majority of the area east of Route 301 is a restricted access/impact area devoted to live-fire training. Fort A.P. Hill is designated as a Regional Collective Training Center by the Department of the Army and is also one of four regional training hubs for the U.S. Army Special Operations Command. A number of specialized facilities exist in the training areas that are designed to mimic combat environments. An example is the Faulkenburg Urban Operations Training Center, completed in 2009. This complex allows for live-fire training within a simulated urban environment, including city blocks



**Figure 8.1** Fort A.P. Hill Existing Land Use Map  
Source: Fort A.P. Hill Real Property Master Plan, Long Range Component, 2013

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containing multiple story buildings and underground utility systems. Another facility, unique within the Department of Defense, is the Asymmetric Warfare Group's sophisticated training complex completed in 2014 which is used to train military members throughout DoD in tactics and responses related to evolving threats associated with low-intensity conflicts and the challenges associated with operations on "non-linear" battlefields. Several hundred military units, primarily located within the eastern United States, travel to Fort A.P. Hill annually for training. Recent year training loads have consisted of approximately 90,000 troops annually who spend more than 700,000 "man-days" of training in the installation.

The installation classifies its land uses into the following functional categories: Ranges and Training, Troop, Professional/Institutional, Community, Industrial, Airfield, and Residential. The majority of facilities on site are associated with housing and community support facilities, training facilities and supply storage (see Figure 8.1). The installation maintains a limited amount of on-post family housing, barracks and bachelor officers' quarters for transient unaccompanied military personnel, community support facilities, and recreational services. The Army sells hunting and fishing permits to licensed, private citizens in neighboring communities for designated areas on post.

The headquarters area, located near the main gate off Route 301 and not far from the Town of Bowling Green, contains the majority of administrative and support uses on the installation and is the most densely developed part of the site. The installation also leases 25 acres along the Rappahannock River, known as Hicks Landing, for riverine operations training; however, training on the riverfront is infrequent.

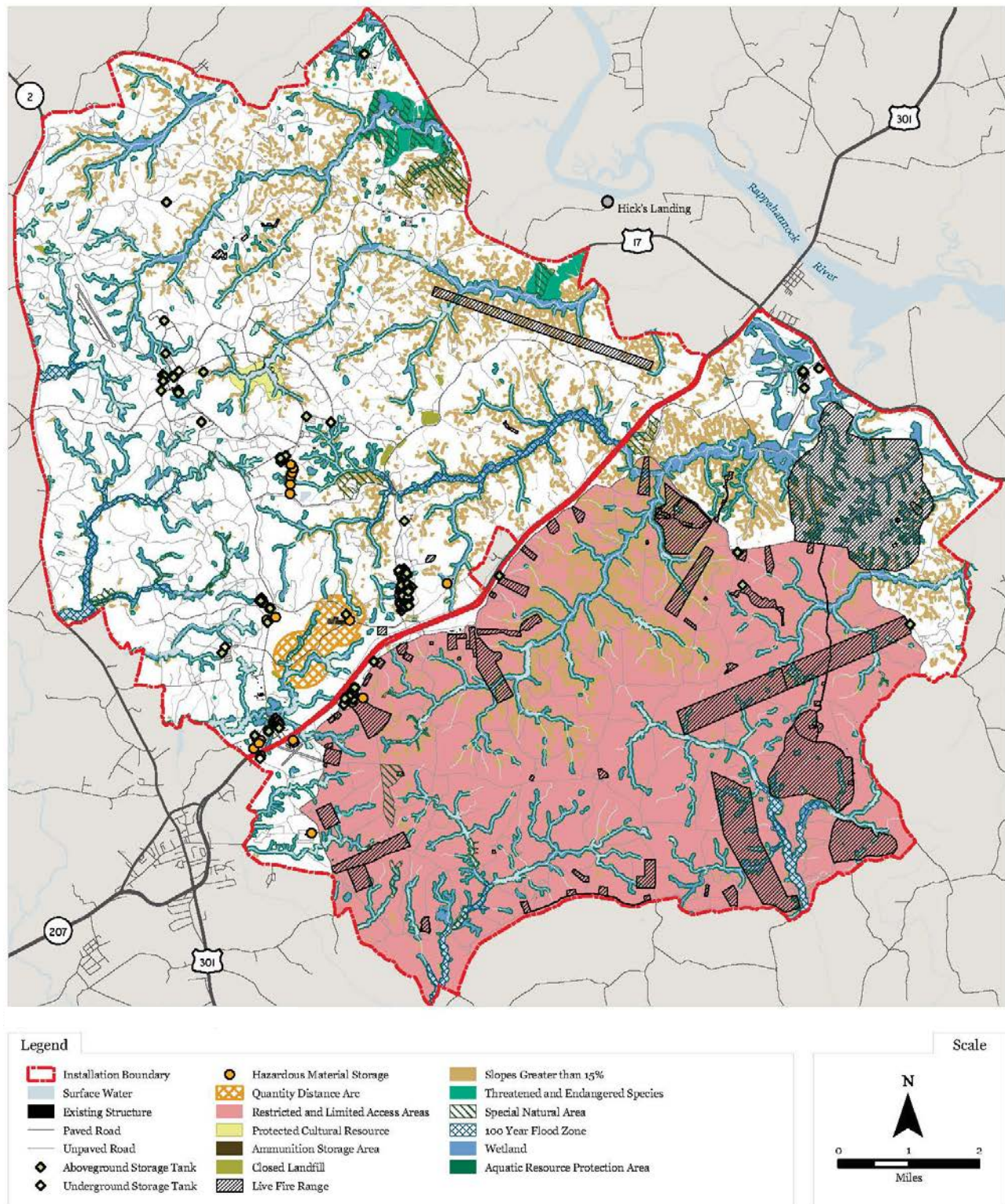
### ***Future Development***

In 2012, Fort A.P. Hill completed a Long Range Component (LRC) of its Real Property Master Plan (RPMP) to guide future land use and facility development (real property) actions on the installation. Among the RPMP guiding principles is an objective to foster cooperation between the military and the surrounding localities in terms of future land uses both inside and outside the fenceline.

Significant environmental constraints coupled with operational factors significantly limit the availability of land on post for future development. The installation must evaluate conflicts for internal incompatibility that could be associated with new facilities, training programs, or missions. Based on an analysis of natural resources, cultural resources, operational activities, and a limitations analysis, the plan identifies areas that are more appropriate for development. Operational constraints are generated by mission activities and/or requirements and typically include runway clearance surface areas, accident potential zones, areas with underground and aboveground storage tanks, hazardous materials storage areas, ammunition storage areas, live-fire ranges, explosive safety quantity distance arcs, closed landfill areas, anti-terrorism/force protection (AT/FP) setbacks, restricted or limited access areas (see Figure 8.2).

The installation is interested in accommodating additional growth on-site that does not negatively impact maneuver areas or their ability to train. For example, a Headquarters-type organization that brings additional permanent staff would be an appropriate fit. Additional administrative-type growth in the headquarters area near the main gate or non-range or training facilities west of the Assault Landing Zone (ALZ) near the Route 2 / Route 606 have been preliminarily identified as potentially suitable areas. No new ranges or operational areas are proposed as part of the current RPMP.





**Figure 8.2** Fort A.P. Hill Composite Limitations

Source: Fort A.P. Hill Real Property Master Plan, Long Range Component, 2013

### 8.2.2 Airspace and Air Safety

Fort A.P. Hill is located in a highly-active airspace corridor often frequented by military aircraft associated with other nearby installations (Hampton Roads and Patuxent River Navy bases, MCB Quantico, etc.), commercial aircraft flying in and out of international airports (Dulles, Reagan National), and smaller aircraft utilizing regional and local airports. Interstate 95 and the Rappahannock River often serve as visual reference corridors for air traffic which means communities around the installation are also impacted by aircraft not associated with training activities at Fort A.P. Hill.

There are no official military airports at Fort A.P. Hill. Fort A.P. Hill does not operate air traffic control and does not do flight tracking. Pilots training at Fort A.P. Hill are given a brief upon arrival and a review of published regulations. Pilots are required to file a flight plan with the Federal Aviation Administration (FAA) that includes an estimated time of arrival (ETA) for reporting and safety purposes. Overall, the type of air operations at Fort A.P. Hill is below the threshold for the Accident Potential Zones (APZs) typically associated with military airfields. Hill Field (formerly Fort A.P. Hill Army Airfield), is officially a landing zone. The field is used primarily by rotary wing aircraft; however, small prop planes and aircraft such as tilt-rotor aircraft also utilize the field as a landing area. There are no APZs that extend off post according to the Department of Plans, Training, Mobilization and Security (DPTMS).

Live-fire range operations at Fort A.P. Hill require FAA enforcement of restricted airspace (R6601) over the impact area east of Route 301, which prevents commercial aircraft from entering the space (below a designated altitude ceiling) and allows installation operations to occur safely. The airspace restriction allows for both ground artillery training and air-to-ground training for rotary and fixed wing aircraft. However, the restricted airspace also impacts internal installation operations and prevents the installation from keeping all air training operations completely contained within the installation perimeter when the impact area is active.

The Army completed an Environmental Assessment (EA) in 2012 to address limitations on training due to the firing angles and heights of both existing and improved weapons technology. Additionally, the approach for military aircraft entering the training areas had been impeded by the relatively low altitude restriction.

A modification to the restricted airspace allowance has recently been approved by FAA to allow expansion of the restricted airspace during specific training times to allow flexibility for operations currently incompatible with the existing airspace restriction.<sup>9</sup> The revised airspace as delineated in the EA will be divided into three shelves: A) A default restriction of surface to 4,500 feet mean sea level (msl), B) An expanded restriction from 4,501 feet msl to 7,500 feet msl, and C) An additional shelf from 7,501 feet msl to 9,000 feet msl. The lowest shelf will be in place from 7:00 AM to 2:00 AM daily and at other times by 24 hour Notice to Airmen (NOTAM). Likewise, shelves B and C require 24 hours NOTAM for activation.

The Class G airspace above the installation west of Route 301 is designated the Fort A.P. Hill Military Operations Area (MOA). While Class G airspace is uncontrolled, the MOA designation serves as an alert to other pilots that military aircraft operations such as aerobatics or high speed maneuvers can occur at any time, and pilots are encouraged to communicate with the military. The area outside of Fort A.P. Hill to the west is Class E airspace with minimal requirements wherein most traffic observes visual flight rules (VFR) and engages in minimal two-way communication.

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<sup>9</sup> Finding of No Significant Impact – Environmental Assessment for Airspace Modification at Fort A.P. Hill, Virginia, June 2012.



### 8.2.3 Noise

Noise associated with Fort A.P. Hill falls into two main categories: aircraft noise and live-fire range noise.

The study of noise is complex, and the degree to which noise becomes problematic depends on a number of both scientific and subjective criteria that are important to mention. Measurement of noise is dependent on the specific type of noise and the way it is perceived by the human ear. The decibel (dB) level of noise, the frequency of the noise, and the period of exposure all affect how the sound is perceived.

The Army categorizes operational noise into zones based on the associated metrics and decibel levels for each noise type. The noise contours are intended to provide a framework for appropriate land uses within the zones of descending decibel level. Zone III constitutes the highest decibel levels (closest to the noise source), while the outermost Land Use Planning Zone (LUPZ) accounts for variability in noise propagation due to operational and seasonal conditions, providing an additional buffer for consideration of potential noise impacts.

Noise Zone	Aviation (ADNL)	Small Arms (PK15(met))	Large Arms, Demolitions, Etc. (CDNL)
Land Use Planning Zone (LUPZ)	60-65	N/A	57 – 62
Zone I	<65	<87	<62
Zone II	65-75	87 – 104	62 – 70
Zone III	>75	>104	>70

**Table 8.4** Noise Zone Decibel Levels

Source: U.S. Army Regulation 200-1, Environmental Protection and Enhancement, 13 December 2007, page 44.

Calculation of Day-Night Level (DNL) for operational noise produces an average noise level that includes a “penalty” for nighttime noise (between 10:00 p.m. and 7:00 a.m.) to account for the greater potential for negative impacts during this time. A-weighting of DNL represents an adjustment used for higher frequency sounds derived from aircraft and transportation sources. C-weighting of DNL is used for low-frequency sounds, including large arms and demolition activities – the kind of noise most frequently associated with Fort A.P. Hill training operations.

**Aviation-related Noise.** Aviation noise is typically measured in A-weighted Day-Night Levels (ADNL). The noise zones are derived from the number of air operations and flight patterns associated with an airfield. Airfields at Fort A.P. Hill are atypical in that no aircraft are permanently stationed at the installation and the level of activity is highly variable, with most air traffic engaged in some type of training associated with flying under combat scenarios. As a result, the number of operations is insufficient to generate the type of ADNL contours that would normally serve as reference points for land use decisions within the area of concern.

**Large Arms-related Noise.** Noise associated with large arms and demolition activity is described by C-weighted Day-Night Level (CDNL) contours. In addition, based on empirical data associated with what triggers citizen concern, Fort A.P. Hill uses peak contours to gauge the potential for noise impacts (and complaints) in the surrounding communities. The unweighted peak noise levels (dBP) represent single event sound levels for impulsive noise rather than average levels. While typically not associated with land use guidelines, the peak contours indicate areas where noise propagation may affect the surrounding community.

**Small Arms-related Noise.** The metric associated with small arms range noise is termed PK15, whereby noise contours represent peak sound levels without frequency weighting and accounting for statistical variation caused by weather, and expected to be exceeded by 15 percent of all small arms range events. The resulting Noise Zone III and Noise Zone II represent 104 PK15 and 87 PK15 respectively.

#### 8.2.4 Vibration

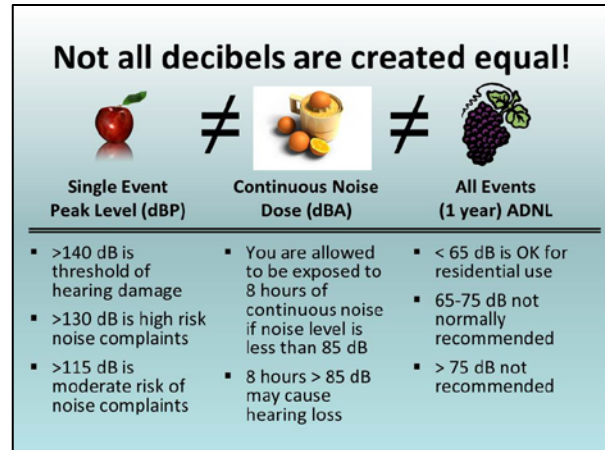
Vibration associated with lower frequency operational noise (explosives, large caliber arms) can become a concern at high decibel levels, and damage from ordnance-related vibration has been reported in the communities surrounding Fort A.P. Hill. Except for a small number of incidences associated with specific, high explosive yield weapon systems, the propagation distance for ground-borne vibration is rather limited; airborne vibration has been witnessed within several miles of range activity. The level of airborne vibration due to live-fire or demolition training is directly correlated with the peak noise level. While structural shaking or window rattling has the potential to alarm homeowners at a lower threshold, actual damage from vibration is unlikely to occur at noise levels lower than 140 dBP.

#### 8.2.5 Noise Sources

**Aircraft Activity.** On average more than 200 aircraft visit Fort A.P. Hill each year; however, the level of activity associated with each aircraft is highly variable. Air operations range from single flights in and out of the installation to multi-week training

involving several operations per aircraft each day. Table 8.5 lists a wide range of military aircraft that regularly train at Fort A.P. Hill. Figure 8.5 shows an overview of Fort A.P. Hill aircraft operations and planning considerations.

**Fixed Wing.** Several airfields at Fort A.P. Hill accommodate a wide range of aviation training opportunities, including a drop zone (DZ), assault landing zone (ALZ), Hill Field, and several landing zones (LZs). Aviation support facilities are limited due to the fact that there are no



**Figure 8.3** Decibel Levels by Type of Noise  
Source: U.S. Army Public Health Command

Service	Aircraft	Fixed Wing	Rotary
Army	CH-47 Chinook		•
	UH-1Huey		•
	AH 64 Apache		•
	OH-58 Kiowa		•
Navy /Marine Corps	CH-46 Sea Knight		•
	CH-53 Sea Stallion		•
	UH-1Huey		•
	AH-1Cobra		•
	MV-22 Osprey		•
Air Force	C-130 Hercules	•	
	C-17 Globemaster III	•	
	C-27 Spartan	•	
Special Operations	CASA 212 Aviocar	•	
	CASA 235 Tactical Transport	•	
	DHC-4/6 Twin Otter & Caribou	•	
	Bell 412		•
	AS-350 AStar		•
	SA-330 Puma		•

**Table 8.5** Typical Aircraft at Fort A.P. Hill  
Source: Fort A.P. Hill Aviation Operations, March 2013

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aircraft permanently stationed at Fort A.P. Hill, and air traffic control is not routinely provided. Limited advisory services are provided by range control, however individual training unit commanders are typically responsible for support of their air operations at Fort A.P. Hill.

Located within the northwest portion of Fort A.P. Hill, the DZ accommodates airdrop training operations for both fixed wing and rotary aircraft, seven days a week both day and night. The DZ is 7,800 feet in length and designed to mimic a combat environment. Located within the DZ, the ALZ is used for takeoff, landing, and drop maneuvers, primarily involving C-17 and C-130 aircraft. There is no air traffic control presence at the DZ/ALZ.

Approaches to the ALZ can vary from 300 to 1,000 feet above ground level (AGL) depending on the type of training activity. More than 70 percent of operations involving takeoffs and landings occur to the northwest of the ALZ due to wind conditions and the airspace restrictions over Fort A.P. Hill's live-fire ranges. Aircraft routinely sustain altitudes between 1,000 and 1,500 feet AGL (sometimes as low as 500 feet AGL) within "racetrack" patterns surrounding the ALZ at three to five mile distances, primarily to the north and west of the installation. In 2012, there were 201 fixed wing takeoffs/landings at Fort A.P. Hill and 197 low passes over the ALZ.<sup>10</sup>

The number of operations at the ALZ is insufficient to generate the ADNL noise contours typical of other military airfields. According to the Army, a C-130 would need to fly over a specific location 200 times in a 24-hour period to generate a contour of 65 ADNL. To address this issue and provide a land use compatibility planning tool, the Army has generated takeoff/landing fans to represent approximate noise buffers corresponding to altitudes of fixed wing aircraft using the ALZ. Based on input from aviation personnel, the innermost fan represents typical altitudes less than 1,700 feet AGL. At an altitude of 1,700 feet, a C-130 is anticipated to generate a noise level approaching 80 dB. An 80 dBA threshold was chosen to represent a noise level potentially objectionable to a significant proportion of the population. The outermost fan corresponds to altitudes between 1,700 and 3,500 feet AGL and noise levels below the 80 dBA threshold.

Slant Distance (Feet)	Type of Aircraft	
	C-130H <sup>1</sup>	C-17 <sup>2</sup>
200	100	108
500	92	98
1,000	85	89
2,000	77	80
5,000	66	66
10,000	57	57
<sup>1</sup> takeoff power, 170knots; <sup>2</sup> intermediate power, 250 knots		

**Table 8.6** C-17 and C-130 Noise Levels  
Source: U.S. Army Public Health Command (USAPHC), 2013

The takeoff/landing fans extend over areas of the surrounding community, specifically portions of Caroline and Spotsylvania Counties northwest of the ALZ and to a lesser extent to the southeast near the Town of Bowling Green. While the average noise level in areas beneath the fans will not reach levels associated with more typical airfields, individual overflights within the inner fan hold the potential to generate undesirable noise levels. As would be expected, noise complaints associated with aircraft activity have largely originated from areas beneath the fans and the racetrack patterns surrounding the ALZ.

**Rotary Wing.** The 70-acre sod Hill Field is located southeast of the main gate and serves rotary aircraft, the largest being the OV-22 Osprey and the CH-53 Sea Stallion. Visual flight rules are observed at the airfield, reducing restrictions associated with imaginary clearance surfaces. A control tower is located at the airfield and is available for use by training units; it is not permanently manned. Pender and Cooke Airfields are located along the northern and northeastern edges of the installation, respectively, and are each grass-surface airfields of 1,000 feet in length. Additionally, a number of individual landing zones (LZs) are located throughout Fort A.P. Hill training areas to accommodate rotary aircraft, including within the range areas.

<sup>10</sup> Fort A.P. Hill Aviation Operations, March 2013.

Night vision training using helicopters and Unmanned Aerial Systems (UAS) takes place through the Military Operations Area at Fort A.P. Hill, including the DZ/ALZ and along the Laser Range, which parallels Route 17. The Communications-Electronics Research, Development and Engineering Center, Night Vision and Electronic Sensors Directorate (CERDEC NVESD) performs test and evaluation using low flying helicopters and Unmanned Aerial Systems (UAS) an average of 300 hours each year. The testing is dependent on dark conditions and is affected by ambient light levels in the surrounding communities. This “light pollution” prevents testing on certain nights and has the potential to become much more of a problem with increased development in areas near the installation, especially to the north and west of the DZ/ALZ.<sup>11</sup> Additional UAV training takes place throughout the airspace above Fort A.P. Hill.

Rotary aircraft routes vary widely based on specific training requirements; however certain routes are typically observed and largely follow the installation perimeter. The blue and grey routes follow the perimeter to the west of Route 301, and the green route hugs the perimeter east of Route 301, outside the impact area restricted airspace. Helicopter pilots also routinely follow the Route 301 corridor across Fort A.P. Hill, known as the white route. Fort A.P. Hill currently observes courtesy avoidance areas over the Towns of Bowling Green and Port Royal and informs pilots during in-briefings to avoid these inhabited areas.

A total of 2,800 military rotary aircraft operations occurred at Fort A.P. Hill during calendar year 2012. Of these, the majority (2,192 operations) took place during daytime hours. An additional 188 non-military helicopter flights also took place during this timeframe. These numbers represent an increase over 2011 totals, whereby 1,730 military rotary aircraft operations were reported at Fort A.P. Hill. The number of total annual aviation operations is anticipated to increase to some degree as aircraft return from war zones abroad.

Air-to-ground live-fire training activities involving helicopters frequently occur at the Range 24 bomb run and Range 25 gunnery complex near the eastern edge of Fort A.P. Hill. Infrequent air-to-ground attack missions involving fighter jet, close air support and gunship aircraft also take place, with armaments consisting of air-to-ground rockets, bombs, cannons, and machine guns. The flight patterns associated with these activities require approaches over areas off post within Essex and eastern Caroline Counties. The aircraft will typically approach the range area from the east and descend to altitudes of approximately 500 feet above msl as they enter the installation impact area (see Figure 8.4). Approximately 1,100 air operations per year of this nature take place, typically associated with 4-5 annual training events.<sup>12</sup>

Due to the wide variability in flight patterns and frequency associated with rotary wing aircraft activity, no defined rotary wing noise zones have been established for Fort A.P. Hill. As described, the perimeter routes and high level of activity at the Cooke and Pender Airfields has resulted in delineation of a noise buffer associated with helicopter activity. The Army has applied a  $\frac{3}{4}$  mile buffer to the  $\frac{1}{2}$  mile perimeter routes to represent the area where rotary aircraft noise is to be most expected within Caroline and Essex Counties (see Figure 8.5). The courtesy avoidance areas in place over the Towns of Bowling Green and Port Royal are designed to reduce the potential for noise impacts in these populated areas.

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<sup>11</sup> Fort A.P. Hill Image Intensification Devices Research & Development and Training – Light Pollution Effects, 2012.

<sup>12</sup> Fort A.P. Hill Aviation Operations, March 2013.

**Range Activity.** The live-fire ranges at Fort A.P. Hill represent a highly valuable training asset for nearly the full range of Department of Defense weapons systems. Primarily located east of Route 301, the range facilities include 40 direct-fire ranges and 42 indirect-fire ranges for both small arms and large arms/demolition training within a restricted access impact area. The Fort A.P. Hill range complex provides training opportunities mimicking combat environments, including combined arms ground activities, as well as aviation ranges for air-to-ground live-fire training. The ranges are highly modernized, with computerized operation and scoring.<sup>13</sup>

Small arms training involves weapons less than 20 mm in size including pistols, rifles, shotguns, and machine guns. Large arms and demolition ranges support training using larger caliber weapons and explosive/demolition activities. The use of specific ranges varies greatly during the year depending on the training requirements of the various units visiting Fort A.P. Hill. Some ranges are designed to accommodate night fire.

**Small Arms.** A number of ranges at Fort A.P. Hill accommodate small arms training, including proficiency and qualification courses. Range activity data has allowed the Army to model noise contours for small arms training operations. Noise Zone III for small arms is nearly entirely contained within the Fort A.P. Hill perimeter, while Noise Zone II extends beyond the perimeter in several areas adjacent to the southeast and northeast portion of the installation, namely in Caroline and Essex Counties (See Figure 8.6).

Noise complaints specifically associated with small arms range activity have been very few in number and are contained within Noise Zone II in Caroline County. Fort A.P. Hill has re-sited proposed range locations in the past based on noise modeling that showed noise zones would extend across heavily populated areas near the installation.

**Large Weaponry and Demolition.** Fort A.P. Hill hosts a variety of large weaponry training opportunities, including the use of tracked and wheeled combat vehicles, and artillery. Many of these ranges cover extensive land areas and are designed to accommodate up to platoon-sized attack training. Mine Clearing Line Charges (MCLIC) have been detonated at Fort A.P. Hill in the past, but have not been used there for several years.

Modeling for large arms and demolition range activity has produced both peak and average noise contours. The large caliber data used in modeling was collected in 2009 and was augmented with what were, at the time, proposed activities of the AWG and EOD at Fort A.P. Hill.

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<sup>13</sup> Fort A.P. Hill, Virginia: A Regional Training Center, 2012.



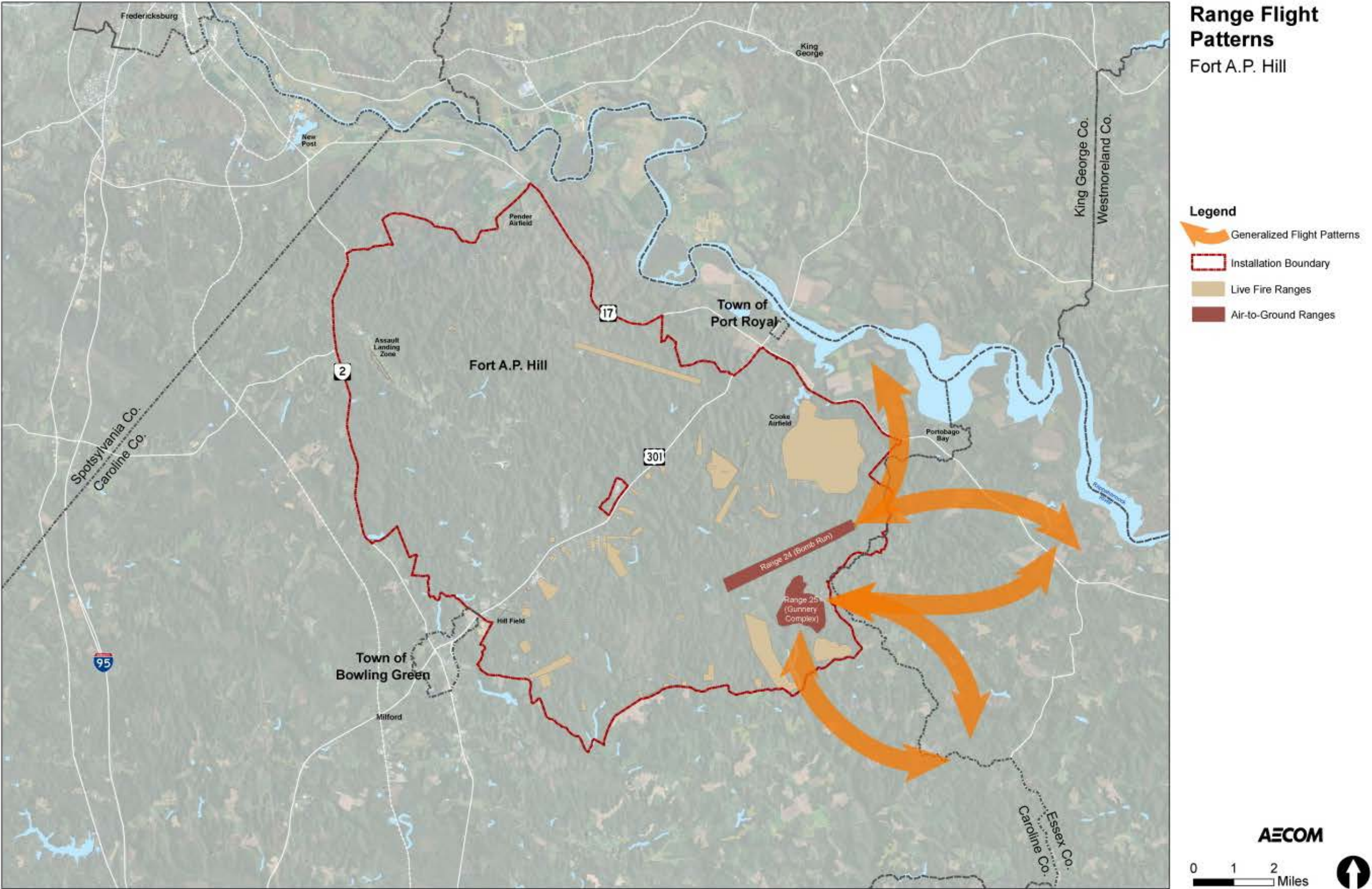


Figure 8.4 Fort A.P. Hill Typical Range Operational Flight Patterns



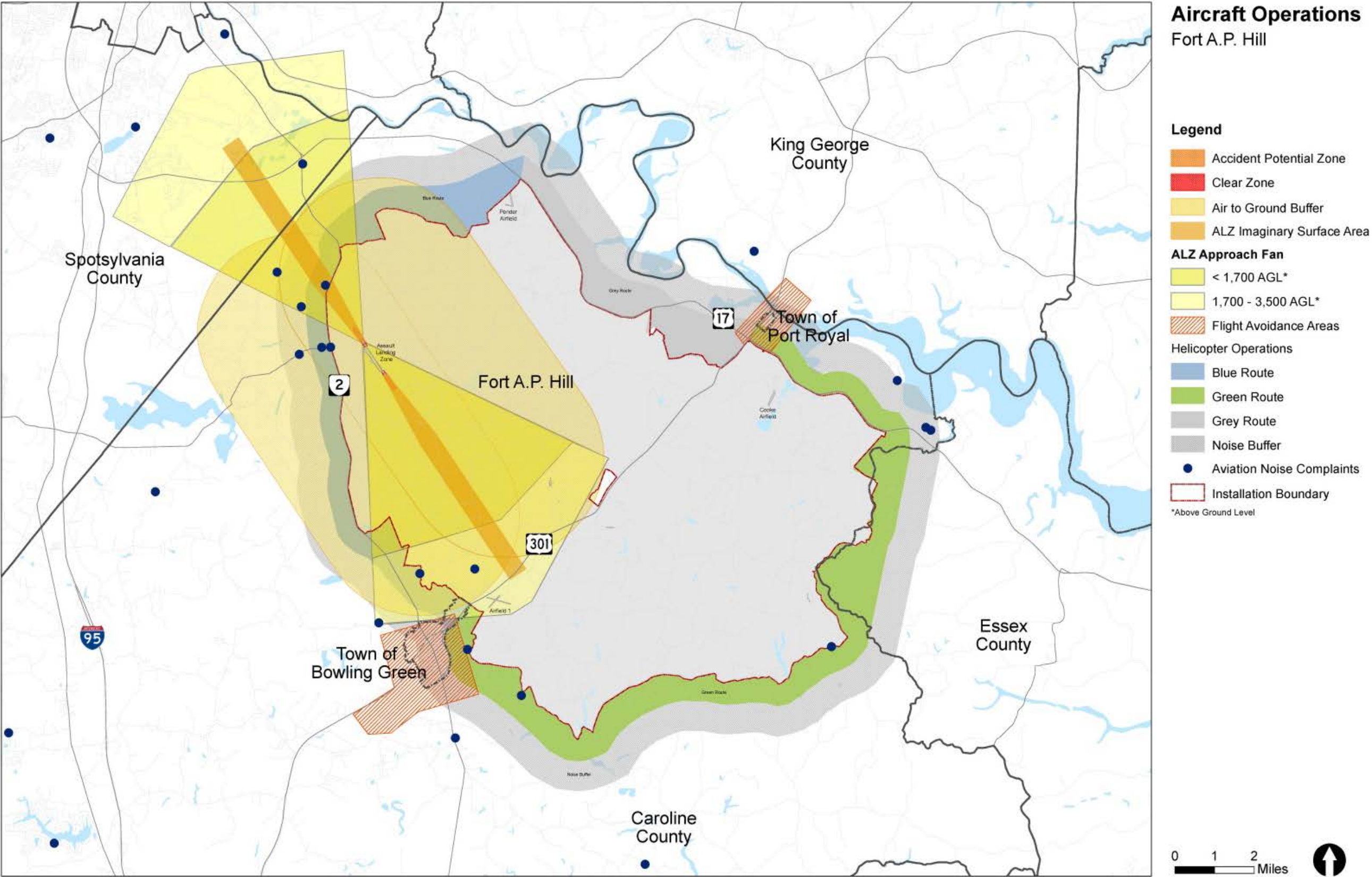
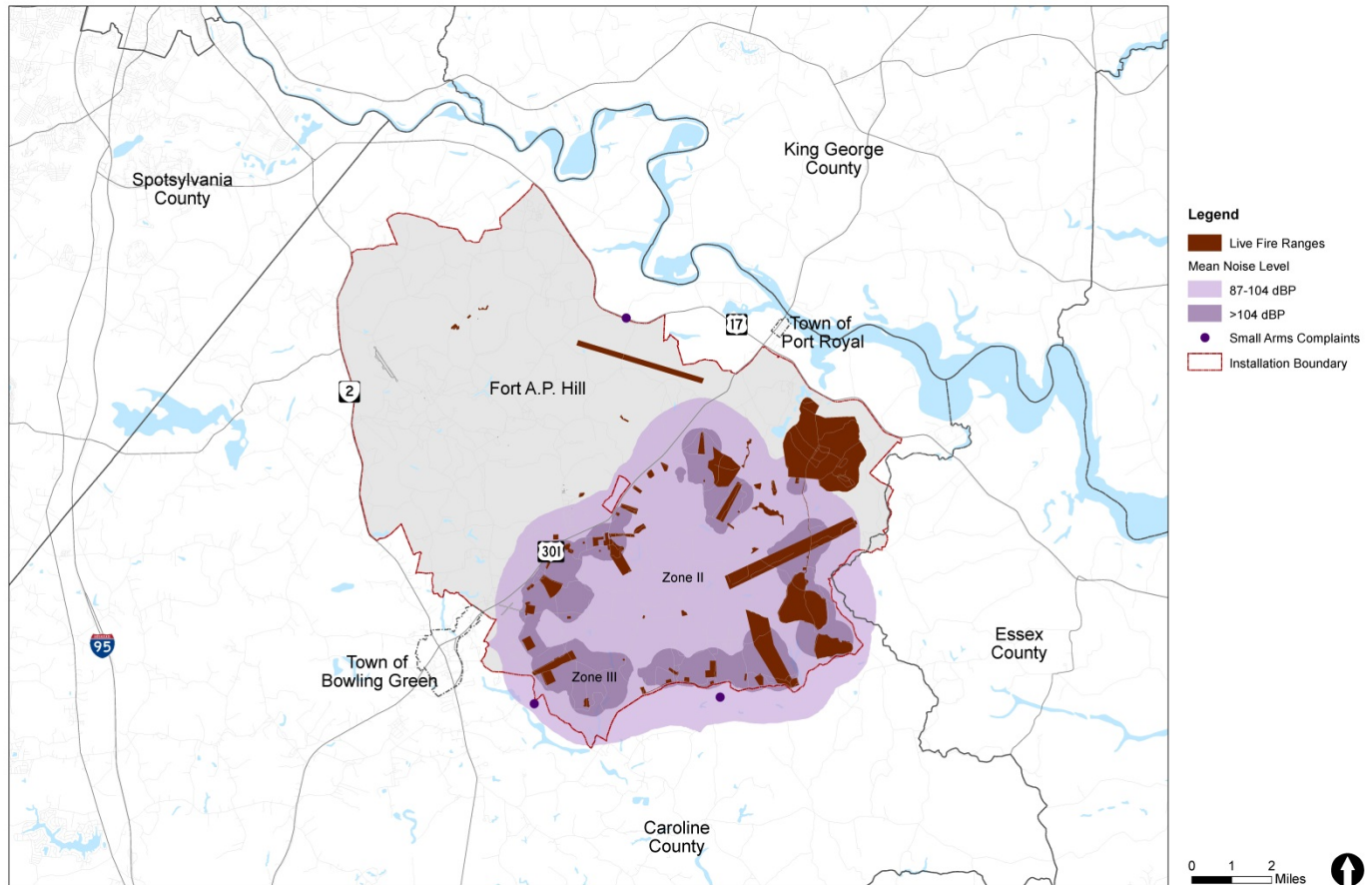


Figure 8.5 Fort A.P. Hill Aircraft Operations



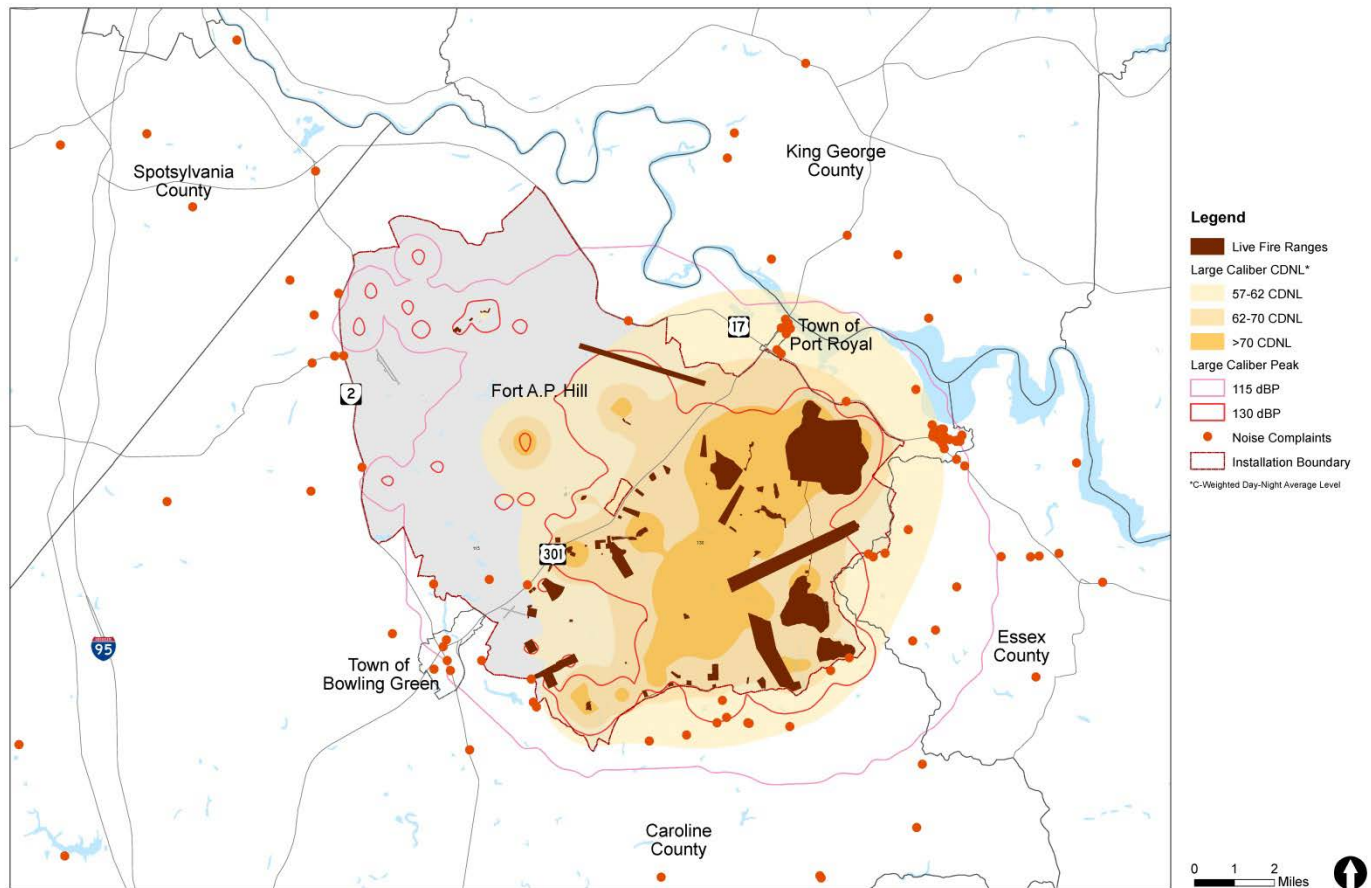
**Figure 8.6** Fort A.P. Hill Small Arms Range Noise Zones

The CDNL noise contours represent three zones based on noise level: Zone III (greater than 70 CDNL), Zone II (62-70 CDNL), and a Land Use Planning Zone (LUPZ) representing (57-62 CDNL). Zone III is entirely contained within the installation perimeter, while Zone II extends approximately 1,630 acres into small portions of Caroline and Essex Counties south and east of Fort A.P. Hill. At approximately 15,820 acres, the LUPZ covers a much broader geographic extent, including north across U.S. Route 17, the Town of Port Royal and the Rappahannock River, and east and south into larger portions of Caroline and Essex Counties (See Figure 8.7).

Peak noise contours for large arms are used to represent the potential for individual noise events to cause disturbance within the surrounding areas, as well as the potential for complaints related to range activities. The 130 dBP noise contour extends approximately 2,790 acres across the installation perimeter into portions of Caroline and Essex counties, while the 115 dBP contour encompasses approximately 38,900 acres of Caroline and Essex counties adjacent to Fort A.P. Hill, as well as the Towns of Bowling Green and Port Royal, extending slightly across the Rappahannock River into King George County. The peak contours do not represent typical noise levels encountered in these areas, but instead represent the potential for noise to propagate under certain circumstances including adverse weather conditions.

Reported complaints associated with demolition and large caliber range activity account for the majority of noise complaints received at Fort A.P. Hill. Of these complaints, most have originated in Caroline County south and east of the ranges, Essex County, and the Towns of Port Royal and Bowling Green.

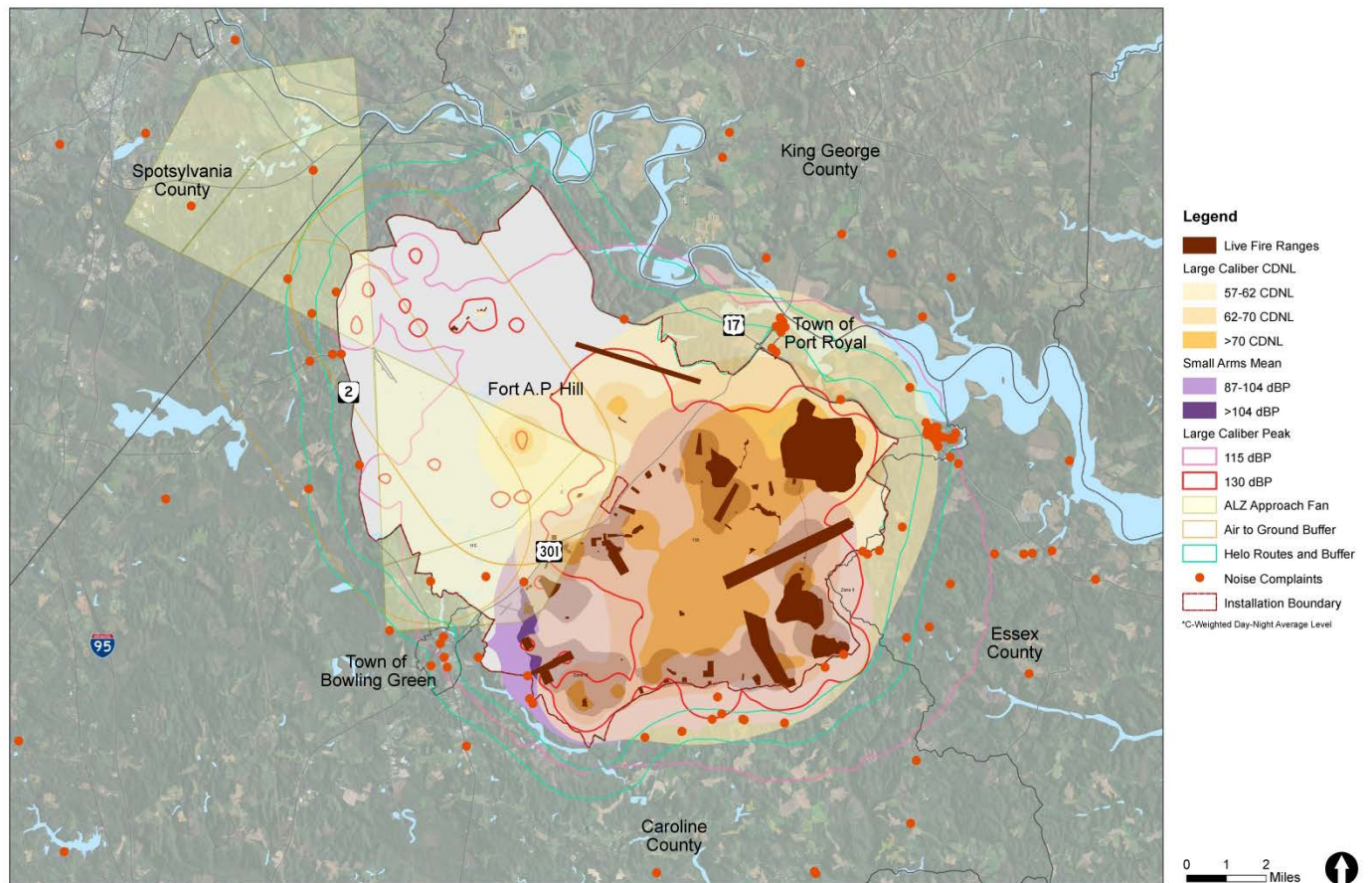




**Figure 8.7** Fort A.P. Hill Large Weaponry and Demolition Noise Zones

### 8.2.6 Combined Noise Profile

The combination of noise zones related to aircraft operations and live fire training reveals the area near Fort A.P. Hill that may expect to experience noise impacts due to military operations (See Figure 8.8). These areas represent the portions of neighboring localities closest to noise sources and/or overflights off post. It should be noted that while this area encompasses a significant portion of the noise complaints the installation has received to date, a fair number have originated outside this area. This speaks to the high degree of variability in terms of both operational tempo and noise propagation, but also to the differences in how sound is perceived. The area under consideration is extensive; the potential for operational noise impacts is not evenly distributed.



**Figure 8.8** Combined Noise Map

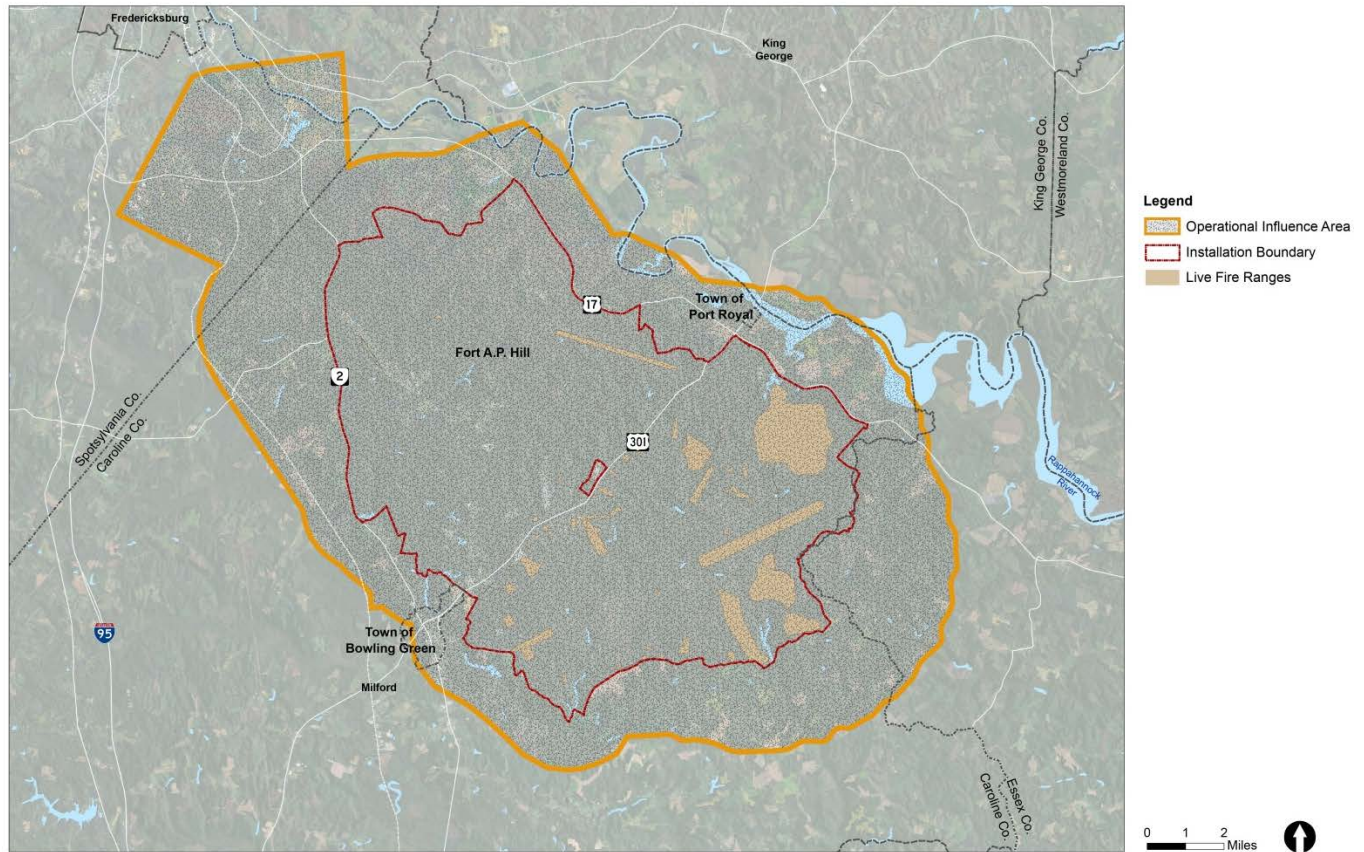
### 8.2.7 Operational Influence Area

For purposes of this study, the combined noise profile outer extent was used as a basis to define a focus area where impacts from operations are more commonly concentrated. This area, identified as the Operational Influence Area (OIA), is described below and shown in Figure 8.9.

The Fort A.P. Hill OIA includes areas noise impacts associated with:

- Rotary wing aircraft operations - based upon identified perimeter helicopter routes and a supplemental helicopter noise buffer of 3/4 mile identified by the installation;
- Fixed wing aircraft operations - based upon defined noise buffer boundaries, closed pattern race tracks, and common take-off and landing patterns as identified by the installation;
- Large caliber weapons operations – based upon peak noise contours (115-130 dBP), noise zone II (62-70 CDNL), and the land use planning zone (57-62 CDNL);
- Small caliber weapons noise zone II (87 – 104 dBP) and III (>104 dBP); and
- The Town of Port Royal secondary growth area, portions of the Caroline County Town of Bowling Green primary growth area, and portions of Spotsylvania County’s growth area.





**Figure 8.9** Fort A.P. Hill Operational Influence Area

All of the operational factors noted above were combined together to create the OIA. These elements define the extent of the potential impact area. Not including Fort A.P. Hill itself, the OIA covers approximately 74,000 acres of land. It is recognized that operational factors are not uniformly present throughout the influence area. For example, impulsive sounds are more prevalent east of U.S. 301 and fixed wing aircraft activity is more prevalent west of U.S. 301.

### 8.2.8 Noise Management

**Operational Noise Management Program.** The Army's Operational Noise Program (ONP) provides a framework for managing noise produced by Army activities. The program, which resides within the United States Army Public Health Command (USAPHC), was established in response to the Noise Control Act of 1972, which determined that noise presents a danger to the health of the Nation's population. The Army's ONMP is designed to:

- Control environmental noise to protect the health and welfare of military personnel and their dependents, Army civilian employees, and members of the public on lands adjacent to Army, Army Reserve, and Army National Guard Installations; and
- Reduce community annoyance from environmental noise, to the extent feasible, consistent with the Army, Army Reserve, and Army National Guard training and material testing activities.<sup>14</sup>

<sup>14</sup> Fort A.P. Hill Operational Noise Management Plan, U.S. Army Public Health Command, 2011

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The Army develops both Statewide and Installation Operational Noise Management Plans (ONMP) to specifically address noise incompatibility and manage encroachment. The plans typically provide strategies for the installation to limit, where feasible, training noise that leaves the installation boundaries and other approaches for noise reduction such as alternating training locations and implementing good neighbor policies. While noise plans are not intended for wide public distribution, the plans, or portions thereof, should be distributed to applicable regional or local land use planners and made available to interested individuals.<sup>15</sup>

The Fort A.P. Hill Operational Noise Management Plan (ONMP) was completed in 2011. The plan provides an overview of the current noise environment and a framework for management of noise associated with aircraft and live-fire operations. The ONMP outlines the various sources of noise as well as the potential for impacts to the surrounding communities and mitigation methods to minimize impacts.

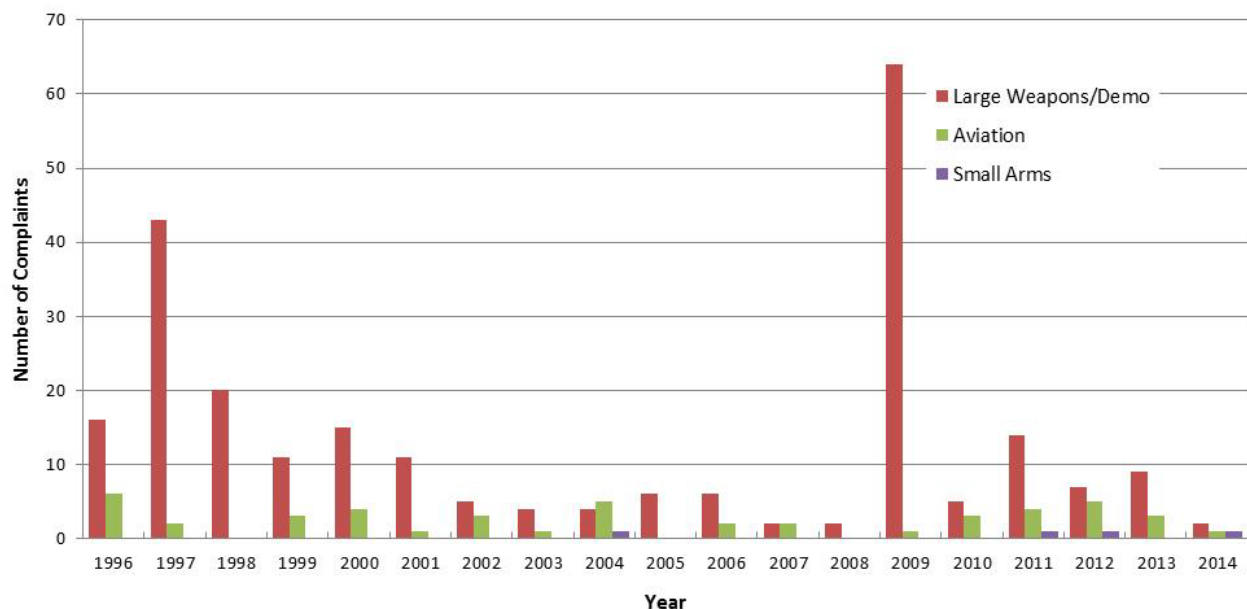
**Noise Monitoring and Noise Reduction Efforts.** Noise monitoring is an important component to any noise management program. Monitoring occurs through the use of a computerized system that integrates noise measurements from permanent or portable noise monitors. A noise monitoring network may also link data with weather characteristics or radar, depending on the sophistication and requirements of the system and operating environment. Atmospheric conditions such as wind and temperature significantly affect noise propagation and the potential for impacts in the areas surrounding Fort A.P. Hill. Temperature inversions can trap sound closer to the ground, allowing it to travel farther distances from the noise source. Fort A.P. Hill maintains a robust noise monitoring system and evaluates weather conditions on a regular basis to evaluate the potential for noise propagation and inform decisions on whether operations should continue or be postponed, if possible, due to unfavorable conditions.

The Environmental Assessment (EA) process for federal construction projects includes evaluation of the potential noise impacts of each project, as well as opportunities for public input. As an example, the EA for BRAC relocation of the Explosive Ordnance Disposal (EOD) School and training range activities to Fort A.P. Hill included a noise monitoring study within the communities surrounding the installation, whereby peak decibel levels (dBP) were recorded at various locations. As a result of that study and public input regarding noise concerns, weight restrictions for demolition activities, as well as range locations, were chosen to minimize potential impacts.

**Complaints.** Fort A.P. Hill has established noise reporting guidelines and a call in number (804-633-8324/8120) that citizens may call to file a noise report. Reporting procedures and a fillable online form are also posted on the installation's website. Citizens are asked to provide information related to their location relative to the noise, as well as date, time and frequency of the noise occurrence. The Fort A.P. Hill Public Affairs Office (PAO) catalogues calls, investigates the source of the noise and cross-checks information with records of the types of operations occurring at the time in order to determine the probable noise source. Complaints are mapped to identify areas of concern. The installation also publishes A Citizen's Guide, Training Noise Management at Fort A.P. Hill that is an informational brochure summarizing the installation's Operational Noise Management Plan, noise-related guidelines and tools, and noise sources at the installation.

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<sup>15</sup> Ibid.



**Figure 8.10** Noise Complaints by Year  
Source: Fort A.P. Hill, 2014

Figure 8.10 shows annual noise complaints by type documented through the Fort A.P. Hill noise reporting process since 1996. The vast majority of complaints (more than 80 percent) during that time have resulted from large arms and demolition range activity. The significant spike in complaints witnessed in 2009 has been tied to the Environmental Assessment (EA) for the EOD range activity proposed at that time.

### 8.2.9 Environmental Compliance

***Integrated Natural Resource Management Plan (INRMP).*** Fort A.P. Hill adopted its Integrated Natural Resource Management Plan in 2008. The INRMP reflects the Army's commitment to conserve, protect and enhance the natural resources that are necessary to provide realistic military training. Its primary objective is to provide a proactive natural resources management plan that guides the installation in achieving natural resource management goals, mission requirements, and compliance with environmental regulations and policies.

The INRMP was developed in coordination with federal, state, and local agencies including the DoD, the U.S. Fish and Wildlife Service (USFWS), the Virginia Department of Game and Inland Fisheries (VDGIF), the Virginia Department of Conservation and Recreation (VDCR), and Department of Environmental Quality. Several regulations mandate the preparation and implementation of an INRMP. It was prepared in accordance with the Sikes Improvement Act, Department of Defense Instruction (DoDI) 4715.3 (Environmental Conservation Program), Army Regulation (AR) 200-1 (Environmental Quality – Environmental Protection and Enhancement), and Supplemental Guidance on INRMP Implementation from the Office of the Secretary of Defense. An EA and finding of no significant impact (FONSI) were prepared to evaluate the potential environmental effects of implementing the INRMP.<sup>16</sup>

<sup>16</sup> Fort A.P. Hill Integrated Natural Resources Management Plan, 2008.

The environment at Fort A.P. Hill provides a realistic setting for infantry, combat support/combat service support, light/medium armored/mechanized infantry, engineer, aviation and artillery training. The natural resources and conditions are a primary need for successful training as the training requires combinations of woodlands at all stages of growth, open and semi-open grasslands and scrub area and water features. The INRMP document is to be updated every five years and outlines an ecosystem level management approach while supporting the military mission. The plan identifies conservation efforts for the installation's natural resources (aquatic, flora, fauna) that ensure compliance with applicable environmental laws and regulations.

The installation provides a home to two federally listed plant species and two state listed plant species, numerous rare habitats and species and species of concern. Installation personnel conduct routine monitoring of known populations of threatened and endangered species, including monitoring for bald eagles in cooperation with the Virginia Department of Game and Inland Fisheries.

In addition, the installation implements a Forest Management Plan and a Strategic Forest Management Plan to provide a sustainable training resource and desired training setting as well as abundant timber, wildlife habitat, and recreation areas. One management technique noted in the INRMP is to utilize prescribed burns to prevent catastrophic wildfires, help maintain a firebreak system, speed nutrient cycling and inhibit encroachment of woody vegetation.<sup>17</sup> Reduced forest fuel availability generally decreases the intensity of a wildfire and increases the ability to respond to and contain the fire safely and effectively.<sup>18</sup> In 2009, Fort A.P. Hill completed an Environmental Assessment for Forest Management Activities that proposed forest management activities, including timber harvesting, prescribed burning, and timber stand improvement actions, to support the military mission by providing ecologically sustainable and viable training lands.<sup>19</sup>

**Air Quality.** The area surrounding Fort A.P. Hill is located within the Northeastern Virginia Air Quality Control Region (AQCR), which is one of seven within Virginia. The Northeastern AQCR is classified as an attainment area for all six established criteria pollutants (particulate matter less than 10 microns, lead, carbon monoxide, ozone, nitrogen dioxide, and sulfur dioxide). The closest Virginia Department of Environmental Quality (DEQ) monitoring station to Fort A.P. Hill is the Fredericksburg Geomagnetic Observatory in Corbin, which currently monitors only ozone levels. Other pollution criteria are monitored at other sites within the region.<sup>20</sup>

Fort A.P. Hill is classified as a minor pollutant source according to Title V provisions, whereby emission sources include boilers, generators, vehicle exhaust, and demolition activities. The Army submits a comprehensive emissions statement to DEQ annually as part of the minor air-operating permit.<sup>21</sup> The installation has reported a decrease in several pollutant criteria in recent years due to a number of factors including an emphasis on energy reduction and efficiency, the transition from oil heating sources to propane, reduced sulfur content of diesel fuel, and use of EPA-certified generators. New construction projects at Fort A.P. Hill undergo analysis of potential air quality impacts as part of the Environmental Assessment process.

Fort A.P. Hill makes efforts to reduce the temporary impacts associated with necessary prescribed burns through application of smoke management plans and careful attention to weather conditions. Particular attention is given

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<sup>17</sup> *ibid.*

<sup>18</sup> Environmental Assessment for FY 2009-2013 Forest Management Activities, Fort A.P. Hill.

<sup>19</sup> *ibid.*

<sup>20</sup> Virginia Department of Environmental Quality, [http://vadeq.tx.sutron.com/cgi-bin/site\\_photo.pl?cams=12](http://vadeq.tx.sutron.com/cgi-bin/site_photo.pl?cams=12), 2013.

<sup>21</sup> Final Environmental Assessment of Constructing and Operating an Explosive Ordnance Disposal Field Training Area at Fort A.P. Hill, Virginia, 2008.

to burns performed in proximity to smoke-sensitive areas such as the Towns of Bowling Green and Port Royal, as well as bordering roadways. The recent EA for forest management at Fort A.P. Hill (described in previous section) indicates that prescribed burns on the installation can continue without any violation of EPA standards for particulate matter.<sup>22</sup>

**Water Resources.** The northeastern 75 percent of Fort A.P. Hill drains to the Rappahannock River and the southwestern 25 percent of the installation drains to the Mattaponi River and then the York River – ultimately the entire site drains to the Chesapeake Bay.<sup>23</sup> Smaller tributaries and unnamed streams exist throughout the installation along with wetlands, ponds, lakes and impoundments. The installation actively participates in water quality monitoring annually for streams within its borders and on a limited basis at ponds and lakes.

**Hazardous and Toxic Chemicals.** The Virginia Department of Environmental Quality (DEQ) publishes the Virginia Toxics Release Inventory (TRI) Report, pursuant to Virginia Code § 10.1-1186.1 annually. The TRI program provides chemical use, release, and waste management information to the public. The annual report contains information on the release transfer, or management of listed chemicals and chemical categories, as reported by more than 400 Virginia industries and federal facilities. According to the report, since 1998, the amount of TRI chemicals released or managed has decreased.

According to the TRI, five facilities reported toxic releases in Caroline County in 2012, including Fort A.P. Hill. Quantities of released toxins are broken into a number of categories including releases to air, releases to water, and releases to land. In addition, the report documents transfers of chemicals off-site, on-site waste treatment and source reduction and recycling activities. As a whole, Caroline County ranked 43 out of 96 in Virginia for pounds of on-site release and 51 out of 96 for pounds of on-site management. Fort A.P. Hill is the largest contributor of releases in the county; the installation ranks 75 out of 416 in Virginia for pounds of on-site release and 412 out of 416 for pounds of on-site management. In 2012, the installation released a total of 29,763 pounds of nitroglycerin on site and 956 pounds of lead compounds transferred off site.<sup>24</sup>

The Toxics Release Inventory Report contains reported information on the quantities of chemicals released and managed, not the public's exposure to, or risk from, the chemicals. Risk to human health by a chemical release depends on the toxicity of the chemical; how it disperses, reacts, or persists in the environment; the quantity, concentration and type of human exposure.

Chemicals reported for the TRI Report are not weighted by their toxicity. For example, a pound of one substance may be more toxic or hazardous than 1,000 pounds of another. Due to the limited nature of TRI data collected, readers are strongly discouraged from making any health or environmental risk/exposure assessments from the information presented.

#### **8.2.10 Land Conservation**

Fort A.P. Hill has actively participated in the Army Compatible Use Buffer (ACUB) program to promote conservation of areas in close proximity to the installation. Fort A.P. Hill initiated its ACUB program in 2005, subsequently partnering, via MOU, with The Nature Conservancy, The Trust for Public Land, The Conservation Fund, The Virginia Outdoors Foundation and U.S. Fish and Wildlife Service in 2006. Working with willing landowners, Fort A.P. Hill's

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<sup>22</sup> Fort A.P. Hill FY 2009-2013 Forest Management Activities Environmental Assessment, 2009.

<sup>23</sup> Fort A.P. Hill Integrated Natural Resources Management Plan, 2008.

<sup>24</sup> Virginia DEQ, 2012 Virginia Toxics Release inventory Report, 2014.

partners have placed more than 9,600 acres of lands under mission-compatible conservation easements since the program's inception. The ACUB program helps preserve military readiness by precluding development that could negatively impact the ability to conduct realistic training while simultaneously assisting landowners interested in conserving family farms and rural lifestyles.

## 8.3 Challenges and Opportunities

### 8.3.1 Challenges

- Incompatible Community Growth and Development Could Lead to Mission Impacts.** The communities of Spotsylvania County, Caroline County, the Town of Bowling Green, and the Town of Port Royal have identified future growth areas that are in close proximity to the installation's boundary or overlap with mission operation areas as shown in Figure 8.5. Many newcomers are often unfamiliar with the installation or its operations which could lead to increased risks for complaints. Concern exists that increased levels of development could result in more pressure to modify or restrict training and operations that would result in mission impacts and the installation's overall role as a regional and national training center. Established guidance for land use compatibility, safety and noise states that higher density zoning and development areas could expect to have a higher potential for impact on military mission versus lower density zoning and development. Not all growth generates negative impacts and some growth may be beneficial to both the installation and the local jurisdictions. However, concerns still remain about the potential for incompatible development within the installation's operational influence area.
 

The following guidance documents are commonly used to evaluate compatibility in designated noise and air safety zones.

  - DOD Instruction 4165.57 Air Installations Compatible Use Zones (2011)
  - Army Regulation 200-1, Environmental Protection and Enhancement (2007)
  - The Federal Interagency Committee on Urban Noise Guidelines for Considering Noise in Land Use Planning (FICUN 1980)
  - Land Use Compatibility Guidelines for APZs (DOD 1977)
- Light Pollution.** Light pollution is a significant concern for the Communications-Electronics Research, Development and Engineering Center, Night Vision and Electronic Sensors Directorate at Fort A.P. Hill. Increased light levels, particularly around the ALZ and Laser Range, are of primary concern due to proximity with the growing Fredericksburg area. Outdoor lighting systems, especially lighting associated with gas stations, billboards, major roadways, athletic fields, and large commercial or industrial uses, allow significant light to travel upward into an otherwise darkened sky. The resulting 'light pollution' can obscure pilot vision or interfere with night training devices. Fort A.P. Hill has provided Caroline County and the Town of Bowling Green with recommendations for outdoor lighting based on measures recommended by the International Dark Skies Association. In addition, the installation is actively working with Spotsylvania County to address lighting requirements as part of development reviews.
- Limits in Virginia State Code.** As a Dillon Rule state, in Virginia local governments only have powers conferred on them by the Virginia General Assembly. Current state enabling legislation only addresses noise impacts generated by a licensed airport, Master Jet Base or military air facility; the code lacks specificity with regard to noise impacts generated by range and/or explosives activities. Similarly, while State Code Section 15.2-2295 requires a disclosure statement on all recorded surveys, plats and final site plans after January 2003, it similarly only applies to parcels within a defined airport noise zone. The Virginia Residential Property Disclosure Act (Title 55, Chapter 27 of the Code of Virginia) places further emphasis on proper documentation of a noise zone by the locality in order for disclosure to apply (see Real Estate Disclosure section below). Lastly,



the Virginia State Construction Code, Chapter 12, addresses airport noise attenuation standards and requirements begin when noise levels are equal to or exceed 65 dBA.

- **Lack of Lodging Options and Retail Amenities.** Many of the tens of thousands of annual transient training personnel training at Fort A.P. Hill commute to the Fredericksburg area or I-95 corridor for lodging due to lack of suitable hotel accommodations in the immediate vicinity of the installation. This situation results in long travel times and occasionally lost training time. In addition, any economic benefits for the Towns are lost to the I-95 corridor. A hotel in close proximity to the installation, in addition to more food and convenience services would supplement the installation's existing amenities and on-base barracks and bachelor officer's quarters.

### 8.3.2 Opportunities

- **Mission Growth.** Recent additions to the Fort A.P. Hill installation include a new training complex to support the AWG and facilities to support the U.S Army EOD mission. The installation will continue to focus on providing training ranges and facilities for all branches of the military and multiple federal agencies. Future BRAC decisions could relocate other missions or facilities to the installation, helping to increase the number of permanently stationed personnel in the area.
- **Coordinated Development Reviews.** The Virginia State Code encourages localities to recognize and take into account the concerns of military installations as related to the development of areas immediately surrounding installations and to include installation commanders in conversations regarding adjacent development where possible. An amendment to Section 15.2-2211 requires localities to "consult with installation commanders of any military installations that will be affected by potential development within the locality so as to reasonably protect the military installation against any adverse effects that may be caused by the development."<sup>25</sup>

The installation participates in a number of development review activities with surrounding jurisdictions including Spotsylvania County, Caroline County and the Town of Bowling Green. The installation reviews proposed re-zonings within the approach fans in Spotsylvania County, is a sitting member of the Caroline County Department of Planning and Community Development Technical Review Committee and reviews re-zonings, subdivision plans and site plans in the Town of Bowling Green.

- **Formalized Coordination.** An ongoing implementation body or committee that meets on a regular basis to share information on mission or community land use changes, monitor implementation progress, and revisit longer-term strategies can be an effective mechanism for collaboration. For example, a Memorandum of Understanding (MOU), when pursued in conjunction with an implementation body, can address protocols for communication and information exchange.

Fort A.P. Hill regularly works with local jurisdictions to support community events and activities, to review development proposals and projects, and to coordinate as part of National Environmental Policy Act (NEPA) planning processes.

- **Planning Input.** A majority of the RPMP's prioritized recommendations are long-term and fall into the timeframe of 2019 or later. Because recommendations within any RPMP can have direct and indirect impacts on surrounding communities, the opportunity for locality input into the RPMP would be beneficial.

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<sup>25</sup> Code of Virginia §15.2-2211

Development of a RPMP is not a public process and mission-related operational security requirements and concerns will need to be considered as the level of locality involvement is defined.

- **Minimize Noise Impacts.** Fort A.P. Hill actively participates in noise management procedures designed to minimize impacts. The installation can explore additional procedural modification strategies such as including flight avoidance areas; modification of range training schedules; alteration of existing flight corridors; conducting additional noise modeling for air operations; implementing reporting procedures to track air operations; improving the installation's website to include noise generation information, monitoring procedures, complaint procedures and contact information; and providing more information to the public regarding air space controls and management. Procedural changes must be evaluated in concert with mission impacts.
- **Site New Ranges to Minimize Community Impacts.** Decisions to introduce a new mission or facility to the installation would be subject to NEPA requirements and evaluation of potential environmental, cultural, and social effects of the action. Additional ranges or airfields and new training missions should be sited to minimize and mitigate noise impacts to the community.
- **Land Conservation.** The ACUB program has provided Fort A.P. Hill an opportunity to partner with conservation organizations in the preservation of agricultural and open space lands located in places where future development could come into conflict with training operations and where it is compatible with goals in local Comprehensive Plans. This program should continue to be explored, where feasible, in order to minimize land use incompatibilities and protect areas where operational noise would make residential development less desirable.
- **Lighting Controls.** Fort A.P. Hill has the opportunity to collaborate with local communities to prevent future impacts associated with light pollution. Input from the installation is important to ensure the localities understand the potential negative impacts to operations and measures that can help prevent those impacts. The Army Regulations that minimize interference with the night vision training environment do not require the strict prohibition of exterior lighting or the complete replacement of existing lighting fixtures. Instead, regulations focus on installing less intrusive lighting applications for new development and/or as part of routine maintenance and replacement of public utilities. Minimum dark sky requirements and standards developed and published by the installation would assist localities in addressing lighting impacts through development reviews and approvals or ordinances. Addressing lighting controls at a jurisdiction level (town or county-wide) would be most effective at combating the issue. In addition, the establishment of an outreach program to educate property owners about the impacts of lighting and potential benefits of following a dark skies approach could lead to voluntary replacement of non-compliant outdoor lighting systems and reduction of light pollution.

## 8.4 Recommendations

Based on feedback received from Fort A.P. Hill, this section establishes a set of recommended actions for the installation to consider that could strengthen coordination between the localities and the installation. The recommendations are organized into the categories described below.

- **Coordination** – to facilitate coordination between Fort A.P. Hill and the localities.
- **Communication** – to improve the dissemination of locality and military operational information.
- **Fort A.P. Hill Operations** – to minimize operational impacts on surrounding community.

## FINAL

- **Economic Development** – to foster economic development opportunities that can support the installation and localities.
- **Legislative Initiatives** – to address gaps in current state enabling legislation related to noise generated by range operations.
- **Utilities** – to evaluate opportunities for improved utility services around Fort A.P. Hill.

Each recommendation includes action steps, a timeframe, rough order magnitude of costs and staffing requirements.

- **Timeframe.** Identifies when the proposed recommendation should be initiated using one of three timeframe categories:
  - **Immediate (highest priority)** Now
  - **Short-term (high priority)** Less than one year
  - **Mid-term (moderate priority)** Between one and four years
  - **Long-term (lower priority)** More than four years
- **Order of Magnitude Cost.** Provides a high level, Rough Order-of-Magnitude (ROM) cost impact for local jurisdictions and the installation to implement the strategy. Costs do not consider efforts undertaken by other parties beyond the JLUS partners.
  - \$ = < \$100,000
  - \$\$ = \$100,000 - \$300,000
  - \$\$\$ = > \$300,000
- **Potential Staffing Requirements.** Provides an estimate of the potential required staff involvement and staff time of local jurisdictions and/or Fort A.P. Hill to implement the recommendation. Staffing requirements do not include efforts conducted by other parties.
  - **L** = minimum
  - **M** = moderate
  - **H** = high

Table 8.7 Fort A.P. Hill JLUS Recommendations

Recommendation		Action Steps	Timeframe	Cost	Staffing
Coordination	1.1	<p>Through an executed MOU, work with the other JLUS partners to establish the Fort A.P. Hill Executive Steering Committee (ESC) including local elected officials and the Fort A.P. Hill Garrison Commander to discuss community, installation and other compatibility issues on a regular scheduled basis and to coordinate and collaborate on the following:</p> <ul style="list-style-type: none"> <li>• Capital improvement and infrastructure planning</li> <li>• Comprehensive plan and other planning document updates</li> <li>• Long range planning for newly proposed missions and on-base facilities, recognizing mission-related operational security requirements exist</li> <li>• Environmental studies related to air and water quality impacts</li> <li>• Pursuit of joint funding for studies</li> </ul> <p>The ESC should include a Working Committee at the planning director level that will form subcommittees as necessary to explore specific issues and opportunities.</p>	Immediate	-	-
	1.2	<p>Continue to solicit input from Fort A.P. Hill as part of a technical review process on development related submittals and text amendments within the Fort A.P. Hill influence area.</p> <ul style="list-style-type: none"> <li>• Formalize Fort A.P. Hill as a technical review committee member or similar status and define consultation procedures to obtain installation input</li> <li>• Seek input from the installation on all development related proposals and text amendments and consider the input in decision-making processes.</li> <li>• Installation provides written input on development related proposals and text amendments.</li> </ul>	Short-term	\$	M
Communication	2.1	<p>Issue Fire Warning Orders (through Caroline Alert and other media and social network venues) of training activities that are non-routine and have the potential to be louder than normal, as well as controlled burn activities, including the proposed time and duration of aviation and ordnance operations.</p> <ul style="list-style-type: none"> <li>• Fort A.P. Hill Public Affairs Office (PAO) to define multiple media and social network outlets for alerts, including ESC and Installation Command Council (ICC).</li> <li>• Develop template for alerts defining information elements.</li> <li>• Localities to include warnings on websites and social media venues.</li> <li>• Seek feedback on effectiveness of alerts from localities and public (during surveys or other planning processes).</li> </ul>	Short-term	\$	M

Recommendation		Action Steps	Timeframe	Cost	Staffing
2.2	Improve the process for noise complaint documentation to include an internal reporting feature that provides the installation with the ability to roll up data to be shared with the ICC or similar venue.	<ul style="list-style-type: none"> <li>Fort A.P. Hill to develop process to aggregate noise complaint data for reporting purposes.</li> <li>Provide presentation to ESC on annual basis and include mapping of complaints.</li> <li>Consider implementing an on-line noise complaint procedure to automatically document complaints.</li> </ul>	Mid-term	\$	M
2.3	Update Fort A.P. Hill's communication plan to include creative opportunities for residents to observe and understand mission activities.	<ul style="list-style-type: none"> <li>Fort A.P. Hill PAO to solicit ideas from localities for creative outreach opportunities (as part of MOU consultation process).</li> <li>Update communications plan accordingly.</li> </ul>	Long-term	\$\$	M
2.4	Re-structure and expand ICC to include local businesses, residents, installation employees, non-profits, etc., to serve as a citizen group designed to promote positive community and installation relations and to help organize and sponsor events and activities and support economic development.	<ul style="list-style-type: none"> <li>ESC to evaluate ICC membership and redefine membership to accomplish intent of strategy.</li> <li>Hold ICC meeting.</li> <li>Establish leadership and purpose of ICC and carry out activities.</li> </ul>	Mid-term	\$	L
2.5	Establish and document a more accountable and timely property claims process, within the Army's legal reporting limits. Consider establishing an installation contact/liaison person (or expand the PAO's role) to work with citizens registering complaints to provide information on status and follow-up of any claims registered.	<ul style="list-style-type: none"> <li>Fort A.P. Hill to define the property claims process and associated contact information for registering a claim.</li> <li>Update Fort A.P. Hill website with information.</li> <li>Provide information to ESC and ICC.</li> </ul>	Mid-term	\$	M
2.6	Revise the Noise Pamphlet to more accurately describe Fort A.P. Hill air operations and activity and update when necessary due to mission changes.	<ul style="list-style-type: none"> <li>Fort A.P. Hill to coordinate with Army Public Health Command to update brochure with current air operations statistics.</li> <li>Provide updated brochure on websites and to localities for distribution.</li> </ul>	Mid-term	\$\$	M
2.7	Develop an outreach program to educate local citizens and electric utility providers about the impacts of lighting on Fort A.P. Hill operations and include suggestions for voluntary inexpensive approaches to help minimize lighting impacts.	<ul style="list-style-type: none"> <li>Fort A.P. Hill and localities coordinate to produce outreach materials, illustrative examples and guidelines on ways to reduce lighting impacts.</li> <li>Coordinate with utility providers.</li> <li>Post materials on website.</li> <li>Hold public lighting workshops to inform citizens and utility providers about minimization techniques.</li> </ul>	Mid-term	\$\$	M
2.8	Update Fort A.P. Hill website to include more information about operations, training, noise impacts and complaint procedures, avoidance areas and key points of contact.	<ul style="list-style-type: none"> <li>Update Fort A.P. Hill website with locality links, fire warning orders, property claims process, noise impacts and complaint procedures and contacts, and avoidance areas.</li> </ul>	Mid-term	\$\$	M

Recommendation			Action Steps	Timeframe	Cost	Staffing
Fort A.P. Hill Operations	3.1	Create an official regulation for Fort A.P. Hill aircraft of flight "Avoidance Areas" over populated areas near the Installation.	<ul style="list-style-type: none"><li>• Fort A.P. Hill to develop official language for regulation.</li><li>• Modify Range and Training Regulation 350-1 to include new avoidance policy.</li><li>• Update in-process briefings to include new regulation.</li><li>• Evaluate for incorporation into Commander policy.</li></ul>	Short-term	\$	M
	3.2	Demarcate flight routes through on-the-ground markers (to help guide pilots away from avoidance areas).	<ul style="list-style-type: none"><li>• Fort A.P. Hill to identify locations for markers.</li><li>• Construct and maintain markers.</li><li>• Modify Range and Training Regulation 350-1 to include information about markers</li><li>• Modify Range and Training Regulation 350-1 to include new avoidance policy.</li><li>• Update in-process briefings to include new regulation.</li></ul>	Long-term	\$\$\$	M
	3.3	Relocate helicopter routes to the interior of the base boundary where it does not conflict with on base training areas.	<ul style="list-style-type: none"><li>• Fort A.P. Hill to evaluate helicopter routes and identify potential modifications and review with localities.</li><li>• Fort A.P. Hill to develop new mapping and policies for updated routes, as applicable.</li><li>• Fort A.P. Hill to integrate new routes as part of information provided during pilot in briefings.</li></ul>	Mid-term	\$\$	H
	3.4	Pursue technical modeling to document training air operations in an effort to create notional or official noise contours associated with Fort A.P. Hill current and future aviation operations. This may require reliance upon assumptions until more accurate data can be collected.	<ul style="list-style-type: none"><li>• Army to fund and conduct noise modeling at Fort A.P. Hill to refine geographic area of noise impacts.</li><li>• Develop aviation noise contours.</li><li>• Develop additional on-base mitigation measures as needed to minimize noise impacts.</li><li>• Share methodology and results with localities.</li></ul>	Mid-term	\$\$	M
	3.5	Establish and implement reporting procedures and requirements to enable the tracking of fixed wing and rotary aircraft operations on an annual basis.	<ul style="list-style-type: none"><li>• Fort A.P. Hill to develop tracking documentation procedures and tools that can be used to aggregate aviation operations.</li><li>• Consider tracking ops by aircraft type to allow data to be used for noise modeling.</li><li>• Provide summary of results annually as part of MOU consultation procedures and to other interested parties.</li></ul>	Mid-term	\$\$	M

Recommendation			Action Steps	Timeframe	Cost	Staffing
	3.6	Provide controlled airspace information and associated altitude restrictions.	<ul style="list-style-type: none"><li>Fort A.P. Hill to develop 3D model of airspace zones around the installation showing altitudes and restrictions governing aircraft.</li><li>Fort A.P. Hill to develop memo explaining coordination procedures with on-base and off-base commercial flights (if any) to convey understanding of multi-use airspace conditions.</li><li>Send information to localities and post on Fort A.P. Hill website.</li></ul>	Mid-term	\$\$	M
	3.7	Schedule range activities involving large caliber/high noise-generating weapons to minimize or avoid training prior to noon on Sundays, as feasible.	<ul style="list-style-type: none"><li>Fort A.P. Hill to identify and map active churches within Operational Influence Area to determine areas of concentrations.</li><li>Fort A.P. Hill to determine approach for potential schedule modifications based on mapping data, weather modeling, noise contours, and distance offsets from churches.</li><li>Fort A.P. Hill to develop local policy for feasible modifications along with potential exceptions (such as reserve unit training on limited schedules).</li><li>Fort A.P. Hill to update website with policy.</li></ul>	Long-term	\$	L
	3.8	Future additional ranges or airfields and new training missions should be sited to minimize and mitigate noise impacts to local jurisdictions and residents.	<ul style="list-style-type: none"><li>Participate in consultation procedures identified in MOU.</li><li>Follow requirements of NEPA.</li><li>Share preliminary analysis of noise impacts with ESC early in planning process.</li></ul>	Long-term	\$	M
	3.9	Expand upon the Communications-Electronics Research, Development and Engineering Center, Night Vision and Electronic Sensors Directorate (CERDEC NVESD) lighting study and publish minimum 'dark sky' requirements for Fort A.P. Hill training operations and work with the communities to incorporate into community lighting ordinances. (Coordinate with recommendation 2.7 as appropriate.)	<ul style="list-style-type: none"><li>Fort A.P. Hill to complete detailed study of lighting impacts and requirements for training, including minimum standards.</li><li>Present findings to localities and participate in development of locality lighting ordinances.</li></ul>	Short-term	\$\$	M
Economic Development	4.1	Support Fort A.P. Hill's pursuit of establishing Washington-Baltimore-Northern Virginia General Schedule (GS) pay grades for all personnel stationed at Fort A.P. Hill.	<ul style="list-style-type: none"><li>Fort A.P. Hill to pursue pay grade issue with the U.S. Office of Management and Budget.</li><li>Localities to write letters of support.</li></ul>	Short-term	\$	M
	4.2	Using manning/training personnel data from Fort A.P. Hill updated on a bi-annual basis, pursue commercial and retail uses off base that support on base employees and local visitors, tourists and residents.	<ul style="list-style-type: none"><li>Fort A.P. Hill to establish a recurring data collection process to document training personnel numbers of partner groups and rotational units.</li><li>Provide data to ESC on bi-annual basis.</li></ul>	Short-term	\$	M



Recommendation			Action Steps	Timeframe	Cost	Staffing
	4.3	Jointly evaluate the benefits and impacts of a new CSX rail spur to support troop and equipment movement and potential mission growth, as well as freight or passenger service benefiting the local communities.	<ul style="list-style-type: none"><li>• Fort A.P Hill and counties to pursue funding for study of CSX rail spur.</li><li>• Develop scope of work and study requirements.</li><li>• Hire consultant or complete study in house.</li></ul>	Long-term	\$\$	M
	4.4	Ensure proper County business licenses are in place for all construction activity at Fort A.P. Hill through improved oversight and accountability.	<ul style="list-style-type: none"><li>• Fort A.P. Hill to arrange meeting with Caroline County and Fort Belvoir / Army Corps of Engineers to discuss county requirements.</li></ul>	Short-term	\$	L
Utilities	5.1	Jointly study the feasibility and potential mechanisms for shared water supply and sewer utility services among the installation, the Town of Port Royal, Town of Bowling Green, and Caroline County.	<ul style="list-style-type: none"><li>• Develop an ESC subcommittee to focus on utility services.</li><li>• Localities to develop initial concept plans for water and sewer utilities for review with installation.</li><li>• Hold meeting with American Water to evaluate concept ideas and Fort A.P. Hill options for supporting shared use (land, etc.).</li><li>• Pursue joint funding for shared services study pending outcome.</li></ul>	Mid-term	\$\$	M
	5.2	Pursue natural gas service to serve Fort A.P. Hill and the Town of Bowling Green/Milford Primary Growth Area.	<ul style="list-style-type: none"><li>• Fort A.P. Hill and Town to coordinate with utility providers for provision of natural gas service.</li></ul>	Long-term	\$\$	M
	5.3	Coordinate extension of broadband / telecommunication services to better serve the communities around the installation.	<ul style="list-style-type: none"><li>• Develop an ESC subcommittee to focus on broadband issues and to coordinate services.</li></ul>	Long-term	\$\$	M
Legislation	6.1	Pursue an amendment to State Code 15.2-2295 to expand the discretionary application of noise overlay zones, sound attenuation and real estate disclosure to incorporate severity of impacts associated with range noises (not just aircraft noise). The modification should apply to any military installation in Virginia with noise-generating operations (not just air facilities or master jet bases).	<ul style="list-style-type: none"><li>• ESC to hold meeting with local legislators to discuss State Code amendments, coordinated with VA MAC and FAAR.</li><li>• Identify local champions for pursuit of amendments.</li></ul>	Mid-term	\$	L
	6.2	Pursue an amendment to the Virginia Construction Code, Section 12, to allow the discretionary application of appropriate noise attenuation standards for impulsive sounds from small arms, large caliber weapons and demolition activity	<ul style="list-style-type: none"><li>• ESC to hold meeting with local legislators to discuss State Code amendments, coordinated with VA MAC and FAAR.</li><li>• Identify local champions for pursuit of amendments.</li><li>• Localities to issue letters of support.</li></ul>	Mid-term	\$	L

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