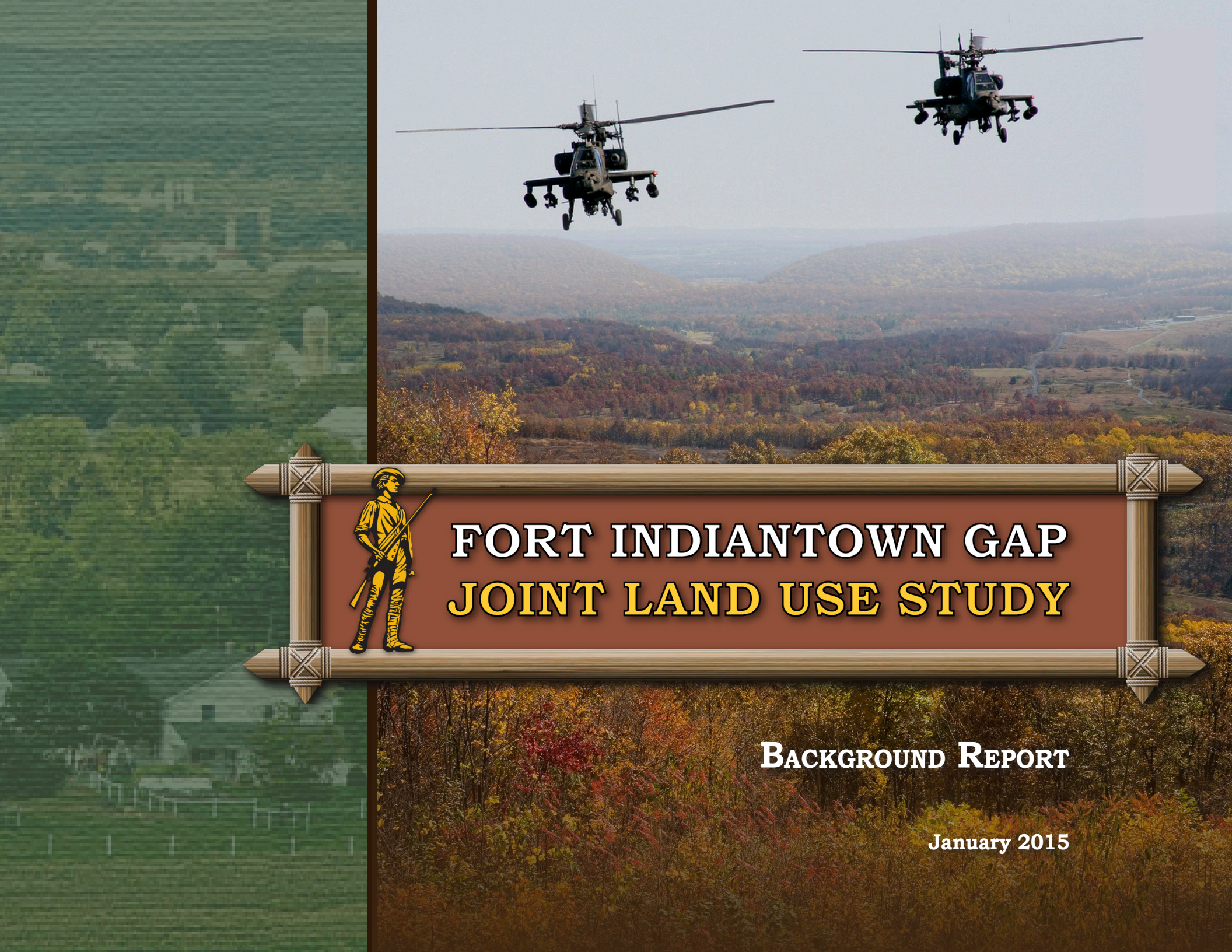

FORT INDIANTOWN GAP
JOINT LAND USE STUDY

Background Report

January 2015

Background Report

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FORT INDIANTOWN GAP JOINT LAND USE STUDY

This study was prepared under contract with the Lebanon County, Pennsylvania, with financial support from the Office of Economic Adjustment, Department of Defense, Lebanon County, Pennsylvania and Dauphin County, Pennsylvania. The content reflects the views of the key JLUS partners involved in the development of this study and does not necessarily reflect the views of the Office of Economic Adjustment.

Matrix DESIGN GROUP

FORT INDIANTOWN GAP

JOINT LAND USE STUDY

BACKGROUND REPORT

JLUS Grant Manager:
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Planning Department
400 S. 8th Street, Room 206
Lebanon, PA 17042

Prepared by

Matrix DESIGN GROUP

January 2015

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Preface

The following Fort Indiantown Gap (FTIG) Joint Land Use Study (JLUS) Background Report is a culmination of committee feedback, public participation, and consultant expertise throughout the JLUS planning process. The Background Report consists of five chapters: an introduction, community profile, military profile, review of existing planning tools, and compatibility assessment.

Please see the next page.

Acknowledgements

Executive Committee

The Executive Committee (EC) served an active and important role in providing policy direction during the development of the Fort Indiantown Gap Joint Land Use Study. The EC comprised the following individuals:

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A

ACHP	Advisory Council on Historic Preservation
ACEPP	Agricultural Conservation Easement Purchase Program
ACP	Access Control Point
ACSIM	Assistant Chief of Staff for Installation Management
ACUB	Army Compatible Use Buffer
ADNL	A-weighted day-night level
AEC	Army Environmental Center
AGL	above ground level
AHPA	Archaeological Historic Preservation Act of 1974
AICUZ	Air Installation Compatible Use Zone
AIRFA	American Indian Religious Freedom Act of 1978
APZ	Accident Potential Zone
AR	Army Regulation
ARNG	Army National Guard
ARPA	Archaeological Resources Protection Act of 1979
AT /FP	Anti-Terrorism / Force Protection
ATAG	Assistant to the Adjutant General

B

BASH	Bird Aircraft Strike Hazard
BLM	Bureau of Land Management
BOA	Board of Aviation
BRAC	Base Realignment and Closure

C

CA	Comprehensive Agreement
CAA	Clean Air Act
CAB	Combat Aviation Brigade
CACTF	Combined Arms Collective Training Facility
CDNL	C-weighted day-night level
CEQ	Council on Environmental Quality
CERFP	Enhanced Response Force Package
CFMO	Construction and Facility Management Office
CFR	Code of Federal Regulations
CIP	Capital Improvements Program
CP	Comprehensive Plan
CRM	Cultural Resource Manager
CST	Civilian Support Team
CWA	Clean Water Act
CZ	Clear Zone

D

dB	decibel
dBA	weighted decibel
DC	Dauphin County
DCA	Departmental Consulting Archaeologist
DMVA	Department of Military and Veterans Affairs
DNL	day-night level
DOD	U.S. Department of Defense
DOD	Department of Defense
DOI	Department of the Interior
DSCOPS	Operations Manager in the Directorate of Operations

E

EA	Environmental Assessment
EAATS	Eastern Army Aviation Training Site
EC	Executive Committee
EIS	Environmental Impact Statement
EO	Executive Order
EPA	Environmental Protection Agency
EPR	Environmental Program Requirements
EQR	Environmental Quality Report
ESA	Endangered Species Act
EST	Engagement Skills Trainer

F

FAA	Federal Aviation Administration
FGDC	Federal Geographic Data Standards
FMO	Facilities Management Office
FOIA	Freedom of Information Act
FONSI	Finding of No Significant Impacts
FPCON	Force Protection Condition
FPPA	Farmland Protection Policy Act
FTIG	Fort Indiantown Gap
FY	Fiscal Year

G

GIS	Geographic Information System

H

HABS	Historic American Building Survey
HAER	Historic American Engineering Record
HCLOS	high capacity line of sight
HIA	Harrisburg International Airport
HQDA	Headquarters, Department of the Army

I

ICRMP	Integrated Cultural Resources Management Plan
ICRMP	Integrated Cultural Resources Management Plan
ICUZ	Installation Compatible Use Zone
IDA	International Dark Sky Association
IESNA	Illuminating Society of North America
IFS	Integrated Facilities System
IGA	Intergovernmental Agreement
IGMR	Indiantown Gap Military Reservation
INRMP	Integrated Natural Resources Management Plan
IRP	Installation Restoration Program
ISR	Installation Status Report
ITAM	Integrated Training Area Management

J

JAG	Judge Advocate General
JFHQ	Joint Force Headquarters
JLUS	Joint Land Use Study

K

km^2	square kilometers

L

LC	Lebanon County
LCTA	Land Condition Trend Analysis
LUPZ	Land Use Planning Zone

M

MAAF	Muir Army Air Field
MACOM	Major Army Command
MBTA	Migratory Bird Treaty Act
MBTS	Medical Battalion Training Site
MFR	Memorandum for Record
MHz	megahertz
MILES	Multiple Integrated Laser Engagement System
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MOUT	Military Operations in Urban Terrain
MPC	Municipalities Planning Code
MTC	Maneuver Training Center

N

NAAQS	National Ambient Air Quality Standards
NACO	National Association of Counties
NAGPRA	Native American Graves Protection and Repatriation Act of 1990
NCTC	Northeast Counterdrug Training Center
NEPA	National Environmental Policy Act of 1969, as amended
NEPA	National Environmental Policy Act
NGB	National Guard Bureau
NGO	Non-Governmental Organization
NGTC	National Guard Training Center
NHPA	National Historic Preservation Act of 1966, as amended
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NTA	Northern Training Area
NTIA	National Telecommunications and Information Administration

O

ODEP	Officer of Department of Environmental Protection
OEA	Office of Economic Adjustment
ONMP	Operational Noise Management Program

P

PA	Programmatic Agreement
PA	Pennsylvania
PAANG	Pennsylvania Air National Guard
PAARNG	Pennsylvania Army National Guard
PADEP	Pennsylvania Department of Environmental Protection
PAM	Pamphlet (Army Regulations)
PAO	Public Affairs Office
PAO	Public Affairs Office
PASDC	Pennsylvania State Data Center
PennDOT	Pennsylvania Department of Transportation
PL	Public Law
PNG	Pennsylvania National Guard
POC	point of contact
POTO	Planning Operations and Training Office

R

REC	Record of Environmental Consideration
REOTS	Regional Equipment Operator Training School
ROD	Record of Decision
RPDP	Real Property Development Plan
RSG	Regional Support Group
RTLP	Range and Training Land Program
RTS-M	Regional Training Site Maintenance

S

SASP	Statewide Airport System Plan
SBCT	Stryker Brigade Combat Team
SCC	State Conservation Commission
SDS	Spatial Data Standards
SGL	State Game Lands
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SJA	Staff Judge Advocate
SL&D	Subdivision and Land Development Ordinance
SOP	Standard Operating Procedure
SR	State Route
SRP	Sustainable Range Program

T

TC	Technical Committee
THPO	Tribal Historic Preservation Officer
TRR	tactical radio relay

U

UAS	Unmanned Aerial System
UCC	Uniform Construction Code
UFC	Unified Facilities Criteria
USACE	United States Army Corps of Engineers
USACERL	United States Army Construction Engineering Research Laboratory
USAPHC	United States Army Public Health Command
USC	United States Code
USFWS	United States Fish and Wildlife Service
USPFO	United States Property and Fiscal Office
UTES	Unit Training Equipment Site

V

VFR	Visual Flight Rules

Access Control Point

A specific location is designated for security purposes to restrict entry into an installation. The purpose of an ACP is to prevent unauthorized access to the installation while maximizing vehicular-traffic flow. An ACP may be in the form of a staffed check-point where personnel check identification badges for permission to entry, physical barriers, vehicular restrictions, or other measures to deny access to a particular area.

Air Traffic Control (ATC)

The system used to direct aircraft in flight, using controllers from both the Federal Aviation Administration and the military.

Ambient Light

The general background illumination that comes from all directions and has no visible source.

Ambient Noise

The background noise that is usually present within an existing environment (built or natural) comprising sounds from many sources, both near and far.

Attenuation

Attenuation is a reduction in the level of sound resulting from an object's distance from the noise source or absorption by the surrounding topography, the atmosphere, barriers, construction techniques and materials, and other factors. Sound attenuation in buildings can be achieved through the use of special construction practices that reduce the amount of noise that penetrates the windows, doors, and walls of a building. Sound attenuation measures may be incorporated during initial construction or as additional construction for existing buildings.

A-weighted Decibel (dBA)

Unit of measurement for noise using a logarithmic scale and measured using the A-weighted sensory network on a noise-measuring device. An increase or decrease of 10 decibels corresponds to a tenfold increase or decrease in sound energy. A doubling or halving of sound energy corresponds to a 3-dBA increase or decrease.

A-weighting

The A-weighting of decibels (dBA) was designed to work primarily with higher frequency sounds. In military noise, this would encompass such sounds as those from generators, aircraft, maneuver drills, and general transportation.

Battalion

A military unit generally composed of multiple companies with a headquarters section (approximately 300 to 1,000 soldiers).

Bivouac

A temporary settlement or shelter consisting of tents, field kitchens, chemical toilets, and showers surrounded by fighting positions.

BNOISE2

A computerized tool that displays noise contours for artillery and explosive operations.

Brigade

A military unit smaller than a division, usually composed of multiple battalions with a headquarters section, to which are attached smaller units tailored to meet anticipated requirements (approximately 3,000 to 5,000 soldiers).

Cantonment Area

Permanent military station, usually containing administration buildings, barracks, and support facilities.

Company

A military unit usually composed of multiple platoons with a headquarters section (approximately 150 soldiers).

Controlled Perimeter

A physical boundary around an installation where access is controlled and sometimes monitored or inspected. Controlled perimeters can also be inside an installation's, normally fenced, boundary as are additional perimeters around more restrictive areas.

Convoy

An organized and controlled group of vehicles that moves over the same route at the same time and under one commander.

C-weighting

The C-weighting of decibels (dBC) is used for intense signals containing low frequency sound energy like those that emanate from large gun blasts, sonic booms, and detonations.

Day-Night Average Sound Level (DNL)

DNL represents an average sound exposure over a 24-hour period. During the nighttime period (10:00 p.m. to 7:00 a.m.), averages are artificially increased by 10 dB. This weighting reflects the added intrusiveness and the greater disturbance potential of nighttime noise events attributable to the fact that community background noise typically decreases by 10 dB at night. For National Guard activities, the DNL may be A-weighted (ADNL) when used to measure aviation noise, or C-weighted (CDNL) when used to measure large caliber weapons noise.

Decibel (dB)

The physical unit commonly used to describe noise levels. It is a logarithmic sound pressure unit of measure used for describing the amplitude of sound, as it is heard by the human ear.

Environmental Assessment (EA)

A publication that provides sufficient evidence and analysis to show whether a proposed system will adversely affect the environment or be environmentally controversial. If the proposed system will adversely affect the environment or be controversial, an EIS is prepared to disclose impacts.

Environmental Impact Statement

As defined in the Council on Environmental Quality regulations, a detailed written report that provides a "full and fair discussion of significant environmental impacts, and (informs) decision makers and the public of reasonable alternatives that would avoid or minimize adverse impacts or enhance the quality of the human environment." The draft EIS evaluates a range of reasonable alternatives and their associated impacts and presents a preferred alternative if one option is clearly favored above the others. After departmental review, the draft EIS is circulated among agencies and the public for comment. Following the public hearing held to formally record comments on the draft, a final EIS is prepared incorporating public and agency input and recommending a selected alternative.

Fixed Wing Aircraft

A generic term used in this document to reference the broadest class of aircraft; those in which aerodynamic lift is generated when the airframe including the fixed, or non-rotating, wing is moved through the air by forward thrust from a jet engine or engine driven propeller. Fixed-wing types customarily include fighter, attack, transport, observation, reconnaissance, and trainer aircraft.

Flight Path

The line connecting the successive positions occupied, or to be occupied, by an aircraft, missile, or space vehicle as it moves through air or space.

Frequency Impedance

The interruption of electronic signals due to the existence of a structure or object between the source of the signal and its destination (receptor).

Frequency Interference

The inability to effectively distribute or receive a particular frequency because of similar frequency competition. As the use of the frequency spectrum increases (such as the rapid increase in cellular phone technology over the last decade) and as development expands near military installations and operational areas, the potential for frequency spectrum interference increases.

Frequency Spectrum

The entire range of electromagnetic frequencies used for communications and other transmissions, which includes frequencies used for radio, cellular phones, and television. In the performance of typical operations, the military relies on a range of frequencies for communications and support systems. Similarly, public and private users rely on a range of frequencies to support daily life.

Geographic Information System (GIS)

A computer system that allows environmental analysts to compile, analyze, and model information relevant to proposals that require environmental analysis. It is also a tool that assists decision making by providing a visual depiction of complex data, customized for the situation and circumstances associated with the decision.

Glare

The presence of excessively bright light, such as direct or reflected sunlight, or artificial light, such as sport field and stadium lights at night. Glare reduces visibility and can completely impair vision when very intense.

Helipad

An area used by combat helicopters for taking off and landing.

Imaginary Surface

The areas surrounding a heliport or runway that must be kept clear of objects that might damage an aircraft. A man-made or natural object that projects above an imaginary surface is an obstruction.

Impulse (or Impulsive) Noise

Noise of short duration (typically less than one second), high intensity, abrupt onset and rapid decay, and often rapidly changing spectral composition. Impulsive noise is characteristically associated with such sources as explosions, impacts, the discharge of forearms, the passage of supersonic aircraft (creating sonic booms), and many industrial processes.

Inholdings

Privately owned land inside the boundary of a publicly owned or protected area such as a military installation, national park, national forest, state park. Inholdings result from private ownership of lands prior to the designation of the land as its public or government use, which then end up grandfathered within the legally designated boundary.

Installation

A grouping of facilities, located in the same general vicinity, over which the installation commander has authority.

Maneuver Areas

Range on which employment of live/inert ordnance is prohibited, used for maneuver element training only.

Night Vision Devices

Image intensifying optical device that use a variety of technologies to provide enhanced vision at night. Night vision devices are in use in all branches of the military, but especially by pilots and Special Forces units.

Noise

Any sound that is undesirable because it interferes with speech and hearing. If intense enough, it can damage hearing.

Noise Contour

Noise contours consist of noise impact lines constructed by connecting points of equal noise level measured in dB and identify areas on a map that fall within that particular dB noise contour.

Noise Exposure Map

A noise exposure map consists of a scaled, geographic depiction of a noise source, its noise contours, and surrounding area.

Noise Level Reduction

The difference, in decibels, between the sound level outside a building and the sound level inside a designated room in the building (usually A-weighted). The NLR is dependent upon the transmission loss characteristics of the building surfaces exposed to an exterior noise source, the particular noise characteristics of the exterior noise source, and the acoustic properties if the designated room in the building.

Noise Sensitive Receptors / Noise Sensitive Land Uses

This term refers to land uses that are typically more sensitive to noise, including residential development, hotels / motels, hospitals, convalescent homes and facilities, schools, day care facilities, libraries, churches, and other similar land uses.

Noise Zones

Noise Zone I is the noise zone that includes all areas in which the PK15(met) decibels are less than 87 (for small arms), the ADNL is less than 65 (for aircraft), and/or the CDNL is less than 62 (for large arms and explosions). This area is suitable for all types of land use. Noise Zone II includes areas where the PK15(met) decibels are between 87 and 104, the ADNL is between 65 and 75, and/or the CDNL is between 62 and 70. Land uses for this zone should typically be limited to manufacturing, warehousing, transportation, and resource protection. Noise Zone III is the zone located closest to the source of noise. It includes PK15(met) decibels greater than 104, ADNL greater than 75, and/or CDNL greater than 70. No noise sensitive uses should occur within this area due to the severity of noise. There is also a Land Use Planning Zone (LUPZ) at the upper end of Noise Zone I and includes areas where the CDNL is between 57 and 62 or the ADNL is between 60 and 65. It does not include land for PK15(met). This zone accounts for variability in seasonal operations where certain times of the year may include a greater amount of operations than normal.

PK15(met)

PK15(met) refers to the peak sound level, factoring in the statistical variations caused by weather, that is likely to be exceeded only 15 percent of the time (i.e., 85 percent certainty that sound will be within this range). This condition only exists in modeling (one cannot take a PK15(met) reading on the ground) and is used for land use planning with small arms, as well as additional information for large arms and other impulsive sound. A PK15(met) level of greater than 130 dB has a high risk of complaints, 115-130 dB has a moderate risk of complaints, and below 115 dB has a low risk of complaints.

Platoon

A subdivision of a company-size military unit, normally consisting of two or more squads or sections (approximately 30 soldiers).

Prescribed Burn

The controlled and intentional ignition of grass, shrub, or forest fuels for the specific purpose reducing vegetation for purposes such as forest management, farming, or habitat restoration.

Range

A place equipped for practice in shooting at targets.

Restricted Airspace

Airspace designated under Federal aviation regulations, within which the flight of aircraft is subject to restriction. Most restricted areas are designated joint use, and operations in the area may be authorized by the controlling Air Traffic Control facility when it is not being utilized by the using (military) agency.

Ricochet

To rebound at least once from a surface.

Rotary Wing Aircraft

An aircraft that derives its lift and forward thrust that allow it to fly from the rotation of blades on an approximately vertical central axis such as a helicopter.

Safety Fans

Access restrictions for each type of weapon fired on any range.

Small Caliber / Small Arms

Conventional military weapons less than 20 millimeters in diameter.

Squad

The smallest tactical unit of military personnel, usually consisting of approximately ten soldiers.

Stryker

A highly deployable-wheeled armored vehicle that combines firepower, battlefield mobility, survivability and versatility, with reduced logistics requirements. The Stryker is the combat vehicle of choice for the Army's Brigade Combat Teams.

Training Corridor

A designated area of land used for training purposes.

Unmanned Aerial Vehicle (UAV) / Unmanned Aerial System (UAS)

A remotely controlled or autonomous aircraft used for surveillance and strike missions. These aircraft are useful in situations where it is too dangerous to use manned aircraft.

Unweighted Peak

The peak, single event sound level without weighting, on the ground. This measurement takes into account everything from berms, to weather, to the length of the grass. However, it is only reflective of that moment in time under those exact conditions. Consequently, there is no particular confidence that the measurement is reliable in other situations, such as the 85 percent certainty of the PK15(met).

Vibration

The oscillation or motion that alternates in opposite directions and may occur as a result of an impact, explosion, noise, mechanical operation, or other change in the environment.

Weighted Sound Level

A sound level (in decibels) that has been weighted to correspond with the non-linear sensitivity of the human ear. A-weighting discriminates against the lower frequencies and is used to measure most common military sounds such as transportation and small-arms fire.

Yearly Day-Night Average Sound Level (Ldn)

Ldn refers to the 24-hour average sound level, in decibels, for the period from midnight to midnight, obtained after the addition of ten decibels to sound levels for the periods between 10:00 p.m. and 7:00 a.m. the following day, averaged over a span of one year.

1. Introduction

Inside Chapter 1 . . .

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Introduction

Military installations are critical to local economies, generating thousands of jobs and millions of dollars in annual economic activity and tax revenue. Historically, incompatible development has been a contributing factor in the loss of training operations and restructuring of mission-critical components to other military installations. To protect the missions of military installations and the health of economies and industries that rely on them, encroachment must be addressed through collaboration and joint planning between installations and local communities. This Joint Land Use Study (JLUS) attempts to facilitate the mitigation of existing and future issues and improve coordination between the local communities and the Pennsylvania National Guard (PNG) Training Center at Fort Indiantown Gap (FTIG).

FTIG is located in the heart of Pennsylvania, within the historic Pennsylvania Dutch country. Due to its size of approximately 17,100 acres, it stretches across four municipalities in Dauphin and Lebanon counties. The majority of FTIG lies within Lebanon County in Union and East Hanover townships. The western portion is in Dauphin County, within East Hanover and West Hanover townships.

The state capital Harrisburg is located approximately 20 miles to the southwest, and the nearest major international airport, Harrisburg International Airport, is located roughly 30 miles to the south in Lower Swatara Township, PA. FTIG is strategically located between major cities: approximately 100 miles away from Baltimore, MD and Philadelphia, PA and 150 miles away from New York City, NY and Washington D.C.

Several communities participated as partners in this JLUS, including Lebanon County containing the townships of Union and East Hanover and Dauphin County containing the townships of East Hanover and West Hanover. As a means to promote and coordinate the compatibility of future growth around the installations and with FTIG's training activities, an organized communication effort between FTIG, the partner communities, and other stakeholder entities that own or manage land and/or resources in the region is needed.

The FTIG JLUS advocates a proactive approach to encourage increased communication about decisions relating to land use regulation, conservation, and natural resource management issues affecting both the community and the military. This study seeks to avoid conflicts previously experienced between the United States (US) military and local communities in other areas of the US and throughout the world by engaging the military and local decision-makers in a collaborative planning process.

What Is a Joint Land Use Study?

A JLUS is a planning process accomplished through the collaborative efforts of stakeholders in a defined study area in order to identify compatible land uses and growth management guidelines within, and adjacent to, an active military installation. These stakeholders include local community, state, and federal officials, residents, business owners, local tribal governments, nongovernmental organizations, and the military who come together to identify compatible land uses and growth management guidelines within the JLUS study area. The intent of the process is to establish and encourage a working relationship among military installations and their proximate communities to act as a team to prevent and/or reduce encroachment issues associated with current and future missions and local growth. Although primarily federally funded by the Office of Economic Adjustment (OEA), Department of Defense (DOD), a JLUS is produced by and for local communities. The project management entity for the FTIG JLUS is the Lebanon County Planning Department.

JLUS Goal and Objectives

The goal of the FTIG JLUS is to protect the viability of current and future training operations, while simultaneously guiding community growth, sustaining the environmental and economic health of the region, and protecting public health, safety, and welfare.

To help meet this goal, three primary JLUS objectives were identified:

- **Understanding.** Convene community and military representatives to identify, confirm, and understand the compatibility issues and concerns in an open forum, taking into consideration both the community's and military's perspectives and needs. This includes increasing public awareness, education, and opportunities for input organized in a cohesive outreach program.
- **Collaboration.** Encourage cooperative land use and resource planning among FTIG and surrounding communities so that future community growth and development are compatible with the training and operational missions at FTIG, while at the same time seeking ways to reduce operational impacts on adjacent lands within the study area.
- **Actions.** Provide a set of mutually supported tools, activities, and procedures from which local jurisdictions, agencies, and FTIG can select, prepare, and approve/adopt and to ultimately implement the recommendations developed during the JLUS process. The actions proposed include both operational measures to mitigate installation impacts on surrounding communities and local government and agency approaches to reduce community impacts on military operations. These tools will help decision makers resolve compatibility issues and prioritize projects within the annual budgeting process of their respective entity/jurisdiction.

Why Prepare a Joint Land Use Study?

Although military installations and nearby communities may be separated by a defined property boundary, they often share natural and manmade resources such as land use, airspace, water, and infrastructure. Despite the many positive interactions among local jurisdictions, agencies, and the military, and because so many resources are shared, the activities or actions of one entity can pose unintended negative impacts on another, resulting in conflicts. As communities develop and expand in response to growth and market demands, land use approvals have the ability to locate potentially incompatible development closer to military installations and operational/training areas. The result can initiate new, or exacerbate existing, land use and other compatibility issues, often referred to as encroachment, which can have negative impacts on community safety, economic development, and sustainment of military activities and readiness.

Collaboration and joint planning among military installations, local communities, and agencies should occur to protect the long-term viability of existing and future military missions. Working together also enhances the health of economies and industries of communities before incompatibility becomes an issue. Recognizing the close relationship that should exist between installations and adjacent communities, the OEA implemented the JLUS program in an effort to mitigate existing and future conflicts and enhance communication and coordination among all affected stakeholders. This program aims to preserve the sustainability of local communities within the JLUS study area while protecting current and future operational and training missions at FTIG.

Regional Economic and Local Importance

In addition to the more than 100,000 individual students and trainees who rotate through FTIG annually, approximately 2,100 people work full-time at FTIG. They include state and federal civilians; military technicians; members of the Active Guard and Reserve program; active-duty soldiers; and employees of contractors and non-Department of Military and Veterans Affairs (DMVA) tenants. In fiscal year (FY) 2014, the economic impact of FTIG was $573 Million comprising payroll disbursements to all employees and installation expenditures. FTIG has historically served as the largest employer in Lebanon County and continues to play a critical role in the local economy.

The Pennsylvania DMVA, headquartered at FTIG, fulfills a dual mission: 1) to provide services to the commonwealth's 1.1 million veterans and their families; and 2) to support the PNG also headquartered at FTIG. The DMVA is one of Pennsylvania's largest employers, with armories and air bases operating in 90 communities in 52 counties throughout the state.

National and State Strategic Importance

In addition to being a major contributor to the economic health of the Commonwealth of Pennsylvania, the South Central Pennsylvania region, and the local economies of Lebanon and Dauphin counties, FTIG is a unique asset within the DOD. It is the only major military training center in Pennsylvania and the only live-fire training site in the state. FTIG's extensive training resources provide unique training opportunities for guardsmen throughout Pennsylvania as well as other National Guard units as far away as Kentucky and New Mexico. In addition to its function as a Training Center, FTIG continues to support training for units of the Marine Corps Reserve, Naval Reserve, Active Army, and Army Reserve, as well as federal, state, and local law enforcement agencies.

FTIG has served an important role in America’s history as a training and deployment center and continues to support our country through an expanded set of missions. The PNG is responsible for preparing troops for combat, performing worldwide combat and combat support operations, providing global reach and the projection of United States military power in support of national objectives; and, at the command of the governor, providing trained personnel to support state and local authorities in times of natural disaster or civil discord. FTIG is one of the busiest National Guard Training Centers in the US, executing an average of 800,000 man-days of training annually.

The PNG, now responsible for day-to-day management of the installation, includes members in the Pennsylvania Air National Guard (PAANG) and Pennsylvania Army National Guard (PAARNG) statewide.

FTIG has a variety of terrain types for training, including grasslands and mountain, and diverse assets that provide unique training opportunities for military personnel and local law enforcement personnel alike. FTIG is used by numerous entities including military, federal, and local agencies. Other users of the facilities and training assets at FTIG include local, county, and state law enforcement officers and students, as well as a variety of community groups and organizations such as the Boy Scouts of America.

Community Activities and Stewardship

The PAARNG has an award-winning environmental program whose management team oversees environmental regulatory requirements, including the protection of cultural resources and issues for all PAARNG properties in Pennsylvania. Limited civilian use of open space and recreational lands and other services is permitted at the installation's discretion, including:

- Hunting and fishing on post (including special access for the disabled)
- Community Club
- Blue Mountain Sports Arena
- Swimming pool (outdoor)
- Post Exchange, gas station, convenience store, military clothing store
- Scouting trips, youth camps, civic tours
- Major public events (Armed Forces Day celebration, Battle of the Bulge re-enactment)
- Pennsylvania National Guard Military Museum

Additional resources are located either adjacent to, or in close proximity to FTIG.

Indiantown Gap National Cemetery. Indiantown Gap National Cemetery (operated by the United States Department of Veterans Affairs) and the Pennsylvania Veterans Memorial is located adjacent to FTIG. In 1976, the site was selected as the national cemetery for the states of Pennsylvania, Delaware, Maryland, New Jersey, Virginia, and West Virginia. The Commonwealth of Pennsylvania donated land for the 677-acre site to the Veterans Administration.

Pennsylvania Army National Guard Armory. National Guard units may have offices, store equipment, or train at armory sites. The PAARNG Armory on East Cumberland Street in Lebanon operates as one of the local family assistance centers in the Harrisburg region. The office offers guidance on medical, legal, financial issues, etc., and helps families of any Active, Guard, or Reserve service members, regardless of branch of service.

Pennsylvania State Parks. Two state parks are located in the northern portion of the county. Memorial Lake State Park is surrounded FTIG in East Hanover Township in Lebanon County. The park consists of 230 acres near the southern base of Blue Mountain and offers boating, fishing, hiking, picnicking, cross-country-skiing, ice fishing and ice skating. The 3,520-acre Swatara State Park consists of rolling fields and woodlands situated along Interstate 81 between Second and Blue Mountains. The State Park is programmed for canoeing, fishing, hiking, picnicking, bicycling, swimming, camping, and environmental education for the site.

Public Outreach

The JLUS process was designed to create a locally relevant document that builds consensus and garners stakeholder support. To achieve the JLUS goals and objectives, the FTIG JLUS process included a public outreach program that provided a variety of opportunities for interested parties to contribute to its development.

Stakeholders

An early step in any planning process is stakeholder identification. Informing or involving them early is instrumental to the identification of their most important issues and resolution through the development of integrated strategies and measures. Stakeholders include individuals, groups, organizations, and governmental entities interested in, affected by, or affecting the outcome of the JLUS document. Stakeholders identified for the FTIG JLUS include, but are not limited to, the following:

- Local jurisdictions
- DOD officials (including OEA representatives) and military installation personnel
- Local, regional, and state planning, regulatory, and land management agencies
- Landholding and regulatory federal agencies
- The public (including residents, landowners, and local businesses)
- Environmental advocacy organizations
- Nongovernmental organizations
- Native American Associations
- Other special interest groups (including local educational institutions and school districts)

Executive Committee and Technical Committee

The development of the FTIG JLUS was guided by two committees, comprising county and township leaders, FTIG personnel, federal and state agencies, resource agencies, local governments, and other stakeholders.

JLUS Executive Committee (EC). The EC consists of officials from participating jurisdictions, military installation leadership, and representatives from other interested and affected agencies. The EC is responsible for the overall direction of the JLUS, preparation, and approval of the study design, approval of policy recommendations, and approval of draft and final JLUS documents.

JLUS Technical Committee (TC). The TC is responsible for identifying and studying technical issues. Membership includes local planners, military base planners, business and development community representatives, natural resource protection organizations, and other subject matter experts as needed to help assist in the development and evaluation of implementation strategies and tools. Items discussed by the TC were brought before the EC for consideration and action.

The EC and TC served as liaisons to their respective stakeholder groups. The EC and TC members were charged with conveying committee activities and information to their organizations and constituencies and relaying their organization's comments and suggestions to both committees for consideration. EC members were encouraged to set up meetings with their organizations and/or constituencies to facilitate this input. The responsibilities and list of participants for the JLUS sponsors, the EC, and the TC are identified in Tables 1-1, 1-2, and 1-3, respectively.

Table 1-1. JLUS Sponsor Responsibilities and Participants

Responsibilities	Participants
■ Coordination ■ Accountability ■ Grant Management ■ Financial Contribution	■ Lebanon County

Table 1-2. JLUS Executive Committee Responsibilities and Participants

Responsibilities	Participants
■ Policy Direction ■ Study Oversight ■ Monitoring ■ Report Acceptance	■ Lebanon County ■ Dauphin County ■ East Hanover Township (DC) ■ Fort Indiantown Gap

Table 1-3. JLUS Technical Committee Responsibilities and Participants

Responsibilities	Participants
■ Identify Issues ■ Provide Expertise to Address Technical Issues ■ Evaluate and Recommend Implementation Options to the EC ■ Provide Draft and Final Report Recommendations to the EC	■ Lebanon County ■ Union Township (LC) ■ East Hanover Township (LC) ■ Dauphin County ■ Tri-County Regional Planning Commission ■ Pennsylvania Department of Military and Veterans Affairs ■ Fort Indiantown Gap

Meetings were held throughout the process to ensure the JLUS identified and appropriately addressed local issues. The meetings conducted are highlighted as follows:

- **Meeting # 1 (February 2013).** This meeting served as the initial kick-off for the committees. This meeting provided an overview of the FTIG mission, introduced the JLUS process and participants, and presented information on the compatibility factors evaluated in this JLUS.
- **Meeting # 2 (June 2013).** A TC meeting was held for the purposes of reviewing compatibility issues identified to date and conducting an exercise resulting in the determination of priority level to be assigned to each compatibility factor. Compatibility issues were also characterized by their geographic location and the entities such as property owners who were affected.
- **Meeting # 3 (October 2013).** A TC meeting was held in October 2013 to review the status of the JLUS report and achieve consensus on prioritization of the compatibility factors and issues to be addressed in the JLUS and identification of potential tools for addressing compatibility issues. Preliminary conflict resolution strategies and compatibility planning tools and strategies were also discussed prior to submitting the Committee Draft JLUS to the EC and TC for review and input.
- **Meeting # 4 (May 2014).** This TC meeting was held on May 6, 2014 to review and discuss the proposed Military Compatibility Overlay District and Military Compatibility Areas and the preliminary strategies.
- **Meeting # 5 (August 2014).** Separate meetings were conducted for both TC and EC on August 28, 2014. During the TC meeting, participants reviewed and discussed recommendations to modify the JLUS document. During the EC meeting, participants discussed the recommended strategies, previous public reviews, and outcome of the TC meeting earlier in the day.

Technical Committee Meeting #3

Public Workshops

In addition to the EC and TC meetings, a series of public workshops were held throughout the JLUS development. These workshops provided an opportunity for the exchange of information with the greater community, assisted in identifying the issues to be addressed in the JLUS, and provided input on proposed strategies. Each workshop included a traditional presentation and a facilitated exercise providing a "hands on," interactive opportunity for the public to participate. The public workshops conducted are highlighted as follows:

- **Public Workshop # 1 (June 2013).** The JLUS project and purpose were discussed, and the standard compatibility factors introduced. Attendees were asked to identify specific compatibility issues that they feel should be addressed in this JLUS. The first set of public workshops for the FTIG JLUS were held on June 10, 2013 at the East Hanover Township Building in Dauphin County and on Tuesday June 11, 2013 at the Union Township Building in Lebanon County. During these meetings, the JLUS team was introduced and an overview of the planning process was provided. Attendees were encouraged to engage in discussion and provide input on any compatibility concerns that should be addressed during the JLUS process through the use of an interactive audience response system that displayed real time results. The JLUS Overview/Compatibility Factors fact sheet was also distributed for use in completing the exercise.
- **Public Workshop # 2 (October 2013).** The second set of public workshops was held on October 9th and 10th, to review the status of the JLUS process, refine the compatibility issues identified to date, and obtain community input to refine and classify the issues. Meetings were held in both Lebanon and Dauphin counties at the same locations as the first workshops.
- **Public Workshop #3 (November 2014).** The third set of public workshops was held on November 12th and 13th, to allow meeting participants to review, discuss, and comment on the Public Draft of the JLUS Report with the JLUS development team. A presentation was made of the Draft JLUS Report, including findings, a review existing policies and regulations, and recommended strategies. Discussion followed afterward with an open question and answer session. Options for public feedback were identified including comment cards that were provided for participants to document their comments and thoughts at the workshops, online electronic comments through the project website, or via letters that could be mailed to the JLUS Project Manager, Julie Cheyney.

Public Workshop #2

Public Outreach Materials

Several publications were developed during the course of the JLUS to keep the public informed and knowledgeable about how a JLUS is conducted and what to expect as the end product. Direct mail postcards, website notifications, and press releases were utilized to notify the public of upcoming meetings. Materials were handed out during the public workshops, posted to the project website, and made available at local libraries for easy access.

JLUS Fact Sheet/Compatibility Factors Brochure. At the beginning of the JLUS program, a JLUS Fact Sheet was developed describing the program, objectives, methods for public input in the process, and the FTIG JLUS proposed study area. This Fact Sheet was made available at the meetings for review by interested members of the public.

This Fact Sheet also served as an informational brochure that describes each compatibility factor used for JLUS development. While not every factor may apply to the FTIG JLUS, this list provides an effective tool to conduct a comprehensive evaluation of compatibility factors within the JLUS study area.

FORT INDIANTOWN GAP
JOINT LAND USE STUDY

Fact Sheet #2: Overview/Compatibility Factors

What Is a Joint Land Use Study?

A Joint Land Use Study (JLUS) is a cooperative land use planning effort conducted as a joint venture between an active military installation, surrounding jurisdictions, state and federal agencies, and other affected stakeholders. The Fort Inidantown Gap JLUS is funded by a grant from the Office of Economic Adjustment (OEA) and contributions by Lebanon County.

The JLUS effort can directly benefit both Fort Indiantown Gap and the surrounding region by:

- Protecting the health and safety of surrounding residents and workers;
- Preserving long-term land use compatibility between Fort Indiantown Gap and the surrounding communities;
- Promoting community planning; and
- Encouraging a cooperative spirit between the military installation and community officials.

JLUS Objectives

UNDERSTANDING. Increase communication between the military, local jurisdictions, and stakeholders to promote an understanding of the strong economic and physical relationship between Fort Indiantown Gap and its neighbors.

COLLABORATION. Promote collaborative planning between the military, local jurisdictions, and stakeholders in order to ensure a consistent approach in addressing compatibility issues.

ACTIONS. Develop and implement strategies for reducing the impacts of incompatible activities on the community and military operations. Design tools to support compatibility in the future.

How long will the JLUS project take?

The Fort Indiantown Gap JLUS is expected to be completed in early 2015.

Who will guide the JLUS development?

Two committees (comprised of city, county, military, and other stakeholders), together with the public, will guide the development of the JLUS. Each group has an important role to play:

EXECUTIVE COMMITTEE (EC). The EC is responsible for leading the direction of the JLUS and monitoring the implementation and adoption of policies and strategies.

TECHNICAL COMMITTEE (TC). The TC is made up of representatives from different agencies and the development community who possess the technical knowledge needed to guide and assist the JLUS process. The TC identifies and addresses technical issues, provides feedback on report development, and assists in the development and evaluation of implementation strategies and tools.

PUBLIC. The public can be involved in the development of the JLUS by providing input and guidance to the process, by informing the representatives of the EC of their concerns and recommendations, by submitting comments and feedback online at www.ftig-jlus.com, and by attending the three public workshops.

Why is it important to partner with Fort Indiantown Gap?

Fort Indiantown Gap is one of the busiest National Guard training sites in the country, training more than 100,000 troops each year. The installation serves as a pre-deployment training site for all branches of our military as they prepare for a variety of operating environments and homeland defense missions. The commitment to training support excellence is also extended to law enforcement professionals and other government agencies at the federal, state, and local levels.

In addition, the Pennsylvania Department of Military and Veterans Affairs (DVMA) is headquartered at Fort Indiantown Gap. DVMA has a dual mission: 1) to provide services to Pennsylvania's 1.1 million veterans and their families; and 2) to support the Pennsylvania National Guard, which is also headquartered at Fort Indiantown Gap.

In fiscal year 2009, Fort Indiantown Gap employed more than 2,600 full- and part-time military personnel and over 500 full-time civilian employees, making it one of the largest employers in Lebanon County. In addition, the fiscal year 2009 economic impact of Fort Indiantown Gap into the local economy was more than $480 million.

Another great benefit from the Fort is the numerous community services it provides to Lebanon County and the surrounding areas. Fort Indiantown Gap provides mutual aid and community services on many fronts.

It is important to partner with the installation on relevant and long-range planning projects to ensure the viability and sustainability of the economic impact and community benefit that Fort Indiantown Gap provides to the local region. The JLUS process strives to deepen the understanding of the benefit the Fort provides for the community and conversely, the community provides for the Fort.

Stay up-to-date on the Fort Indiantown Gap JLUS at: www.ftig-jlus.com

Fort Indiantown Gap JLUS Fact Sheet #2

Strategy Tools Brochure. JLUS strategies constitute a variety of actions that local governments, military installations, agencies, and other stakeholders can take to promote compatible land use planning. This brochure provides an overview of the strategy types that can be applied to address compatibility issues around FTIG.

Website. A project website was developed and maintained that provided stakeholders, the public, and media representatives with access to project information. This website was maintained for the entire duration of the project to ensure information was easily accessible. Information contained on the website included program points of contact, schedules, documents, maps, public meeting information, and downloadable comment forms. The project website is located at www.ftig-jlus.com.

JLUS Study Area

FTIG is located on approximately 17,100 acres in the heart of Pennsylvania, within the historic Pennsylvania Dutch country. Most of FTIG lies in northwestern Lebanon County, with its western portion in Dauphin County. FTIG is approximately 5 miles wide (north to south) and 11 miles long (east to west). FTIG Second Mountain borders the facility to the north while the facility's southern border abuts Interstate 81 (I-81) immediately south of the junction with Interstate 78. FTIG is accessible by a major transportation corridor, I-81, allowing FTIG to maintain a regional and state importance. The regional location of FTIG is illustrated on Figure 1-1.

The FTIG JLUS study area is designed to address all lands near FTIG that may impact current or future military operations or be impacted by operations. Therefore, due to its location within four municipalities (East Hanover and West Hanover townships in Dauphin County, and Union and East Hanover townships in Lebanon County), the primary JLUS study area was identified based on the area experiencing the most direct impacts, such as noise and proximity to flight safety zones associated with FTIG.

Fort Indiantown Gap Joint Land Use Study

Communication and Coordination

In any planning effort, plans can only move toward successful implementation if frequent ongoing communication is maintained among local jurisdictions, the military, state and federal agencies, landowners, and the public. Enhanced communication and coordination is an integral component to successful compatibility planning in support of the military's existing and potential future mission(s).

Comprehensive / General / Master Plans

These are long-range plans that outline goals and policies to guide the physical development in a local jurisdiction (county, city, township, etc.). These plans are designed to serve as the jurisdiction's blueprint for future decisions concerning physical development as well as for land use, infrastructure, public services, and resource conservation. These types of plans consist of written text discussing the community's goals, objectives, policies, and programs for the distribution of land use as well as one or more diagrams illustrating the general location of existing and future land uses, roadways, public facilities and parks and open space.

Deed Notifications / Restrictions

Deed restrictions, or covenants, are written agreements that restrict or limit some of the rights associated with property ownership. These restrictions are recorded with the deed for the property and are attached to the property when it is sold to a new owner (i.e., they remain in effect). Dee restrictions are private agreements or contracts executed between a motivate buyer and a willing seller.

Habitat Conservation Tools

The primary objective of habitat conservation tools is the protection of sensitive natural habitats and the species that occupy them. An example of this is the federal Endangered Species Act (ESA) which allows for the development of Habitat Conservation Plans (HCPs). An HCP identifies and provides for the regional or area-wide protection of plants, animals, and their habitats, while allowing compatible and appropriate economic activity. The primary objective of the HCP program is to conserve natural communities at the ecosystem level while accommodating compatible land use.

Hazard Mitigation Plans

Hazard mitigation is defined as any sustained, cost effective action to reduce or eliminate long-term risk to people, property, and the environment from natural and man-made hazards and their effects. Hazard Mitigation Plans

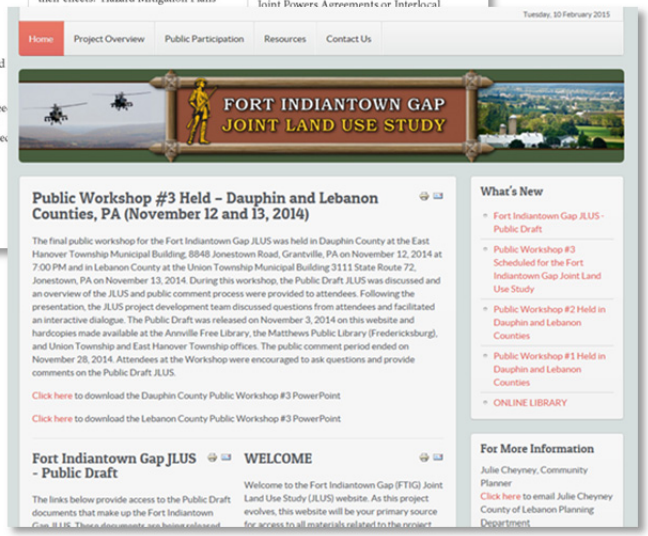
Legislative Tools

State and local legislation can have a significant impact on compatibility planning by allowing, restricting, or limiting the tools available to local jurisdictions to control land use planning activities. Legislative tools are designed to encourage changes in state and local laws and ordinances to support the objectives of the recommended JLUS strategies.

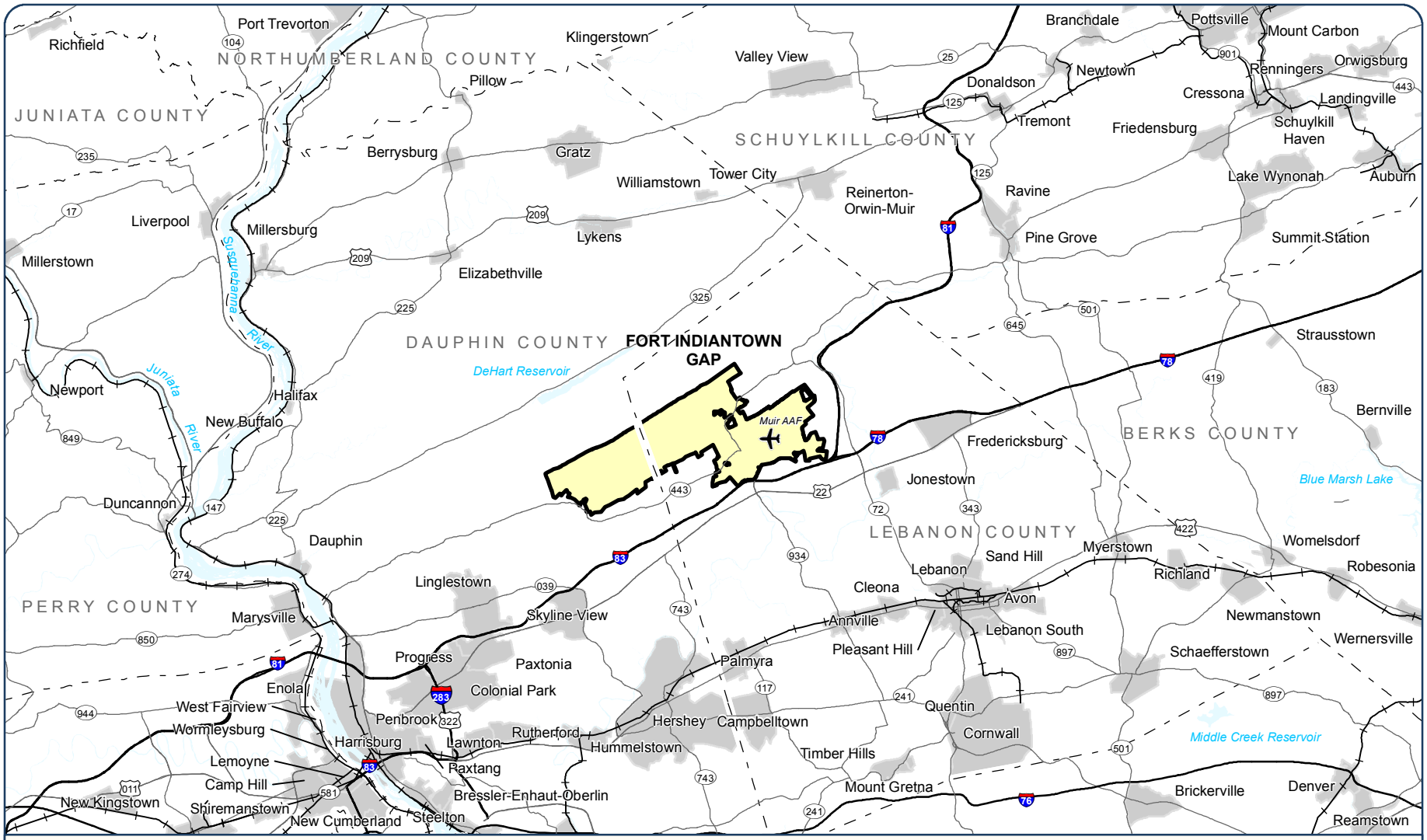
Memorandum of Understanding (MOU)

A Memorandum of Understanding (MOU) is a contract between two or more government entities. The governing bodies of the participating public agencies must take appropriate legal actions (often adoption of an ordinance or resolution) before such agreements become effective. The purpose of an MOU is to establish a formal framework for coordination and cooperation. These agreements may also assign roles and responsibilities for all of the agreement's signatories. These agreements are also known as Joint Powers Agreements or Interlocal

Fort Indiantown Gap JLUS Strategy Tools Brochure



Fort Indiantown Gap JLUS Website



Sources: PennDOT, 2013; FTIG, 2013; PASDA, 2013.

Figure1-1_Regional_20140530_JKC.pdf

Figure 1-1: Regional Location

In addition, an indirect study area was identified as the general area within a three mile radius from the installation perimeter to consider impacts on transportation systems and general coordination and communication amongst municipalities; however this area may expand or contract based on the compatibility factor being assessed. The primary characteristics evaluated in determining the study area were compatibility factors associated with military mission readiness and land uses such as those producing noise and vibration, and/or dust and smoke, and those requiring infrastructure extensions.

JLUS Background Report Organization

The following is a brief overview of the organization of the FTIG JLUS Background Report, including the contents of each chapter.

Chapter 1: Introduction. Chapter 1 provides an introduction and overview of the FTIG JLUS. This chapter describes the working relationships among the entities, the background and intent of the JLUS, the study area, the objectives used to guide development of the JLUS, stakeholders involved in developing the JLUS, public outreach methods, implementation premise, and the document organization.

Chapter 2: Community Profile. In developing this JLUS, an informed understanding of FTIG and local jurisdictions within the study area is necessary. Chapter 2 provides a profile of the local jurisdictions followed by an overview of the region's growth potential, including population, housing, transportation, and important environmental and historic areas.

Chapter 3: Military Profile. This chapter introduces FTIG and discusses the installation missions, strategic and local importance of FTIG, importance of mission sustainment, facility and training capabilities and operations, its role in national defense, and potential future missions. This chapter also discusses the installation's setting including economic impact on the community and its history as the military baseline context for the JLUS.

Chapter 4: Existing Compatibility Tools. This chapter provides an overview of existing relevant plans, programs, and studies that provide tools to address compatibility issues in the JLUS study area including local, state, and federal plans and programs. The purpose of this chapter is to filter the tools readily available to stakeholders and assess whether the tool is adequate or in need of modification or development to facilitate achievement of compatibility planning objectives.

Chapter 5: Compatibility Assessment. This chapter presents the issues identified by the EC, TC, the public, and JLUS team and provides an assessment of issues based on existing tools to address compatibility and feedback collected throughout the planning process. This chapter enumerates the compatibility issues identified and categorizes them by compatibility factor.

Please see the next page.

2. Community Profiles

Inside Chapter 2 . . .

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Current Development Overview within the Study Area 2-6

Regional Overview

Fort Indiantown Gap (FTIG) stretches between Lebanon and Dauphin counties in southeastern central Pennsylvania. The installation lies between US Interstate 81 (I-81) and a northeast running stretch of Pennsylvania State Game Lands (SGL), approximately 20 miles northeast of the state capital at Harrisburg. Located outside the immediate suburbs of Harrisburg, FTIG is located among rural farmland organized into townships and small communities along state highways and the interstate. This chapter provides information detailing the population growth, economic activity, and relationship of these communities with FTIG in order to better understand existing and potential long term compatibility issues associated with the continued mission of FTIG.

Lebanon County

The area which is now Lebanon County was originally home to the Lenni Lenapi members of the Algonquin Tribe who were displaced by colonial frontiersmen during the 1730s. The county was created by an Act of Assembly in 1813 from portions of land comprising Dauphin and Lancaster counties. Scotch-Irish and German families were the primary groups to settle the Lebanon Valley. The Pennsylvania Dutch culture is a lasting legacy of these early farmers, and the rural nature of the region which continues today is the result of long-standing resistance to development pressures.

Lebanon County covers a total of 362 square miles, of which 45 percent is still used for agriculture. Nearly 12,335 acres of the county are part of the FTIG facilities while an additional 23,000 acres are categorized as SGL.

Much of the land consists of gently rolling hills and the steep mountain slopes of the Blue and South Mountains. This unique topography contributes to the rural nature of the area which continues to make it a desirable place to live and visit.

The area's agricultural heritage remains evident today; though much of the last century was shaped by the rise and fall of steel operations based at the American Iron and Steel Manufacturing Company in the City of Lebanon. This brought a rise in population and activity in the post-war years, but production decreased in the 1970s with the closure of the mill. The 21st century economy is characterized by a transition towards information and services, which have seen success along the numerous interstates and highways running through the county. This has positioned the county at the crossroads between networks stretching from Philadelphia to Pittsburgh. Lebanon County is now home to multiple major employers that extend their services beyond the county, including Bell & Evans, The Good Samaritan Hospital, Philhaven Hospital, the US Army based at FTIG, and Swift Transportation Company. As of the 2010 Census, the county had 133,568 residents with a median income of $53,474.

Sources: Lebanon County Comprehensive Plan, 2007; US Census Bureau 1990-2010

East Hanover Township

East Hanover Township in Lebanon County covers approximately 33 square miles, bordered to the north by SGL, and to the south by Swatara Creek. FTIG occupies nearly half of the total land in the township. The township is located on the southern boundary of FTIG along I-81 in rural Lebanon County. With a 2010 population of 2,801, the township has experienced a steady decline in recent decades. The area is mostly rural with limited commercial development along William Penn Highway (Highway 22). The area is home to Memorial Lake State Park, located adjacent to FTIG, in addition to the Indiantown Gap National Cemetery, also associated with the installation.

Sources: Lebanon County Historical Society, 2013; US Census Bureau 1990-2010

Union Township

Union Township in Lebanon County is located directly east of FTIG and encompasses the eastern portion of the installation within its jurisdictional boundaries. The township encompasses an area of nearly 30 square miles of mostly rural lands, including farmland, rural residential, FTIG facilities, state parks, and open space. The facilities at FTIG, including Muir Army Airfield (MAAF), account for roughly one-third of the land within the township. The township is situated at the intersection of Interstates 81 and 78 with State Route (SR) 72 and Highway 443 running through the area. The Bashore Boy Scout Camp and Swatara State Park are both located within the township. Major employers including Tyco Electronics and Swift Transportation have facilities near I-81. The 2010 population of Union Township was 3,099, which represents continued stable growth over the past twenty years.

Sources: Lebanon County Historical Society, 2013; US Census Bureau 1990-2010

Dauphin County

Dauphin County is home to the state capital of Harrisburg, PA. The county traces its origins back to the early 1700s when the Harris family settled on the Susquehanna River and operated a ferry and trading post. The area grew through the American Revolution and in 1785 the county was formed to establish a government seat near "Harris' Ferry". In 1822 the first capital building was constructed to support the state government's movement from Lancaster to Harrisburg which began in 1810.

Development and population growth continued to occur around the settlement which would become Harrisburg. Today, these trends continue in the county as the county's urban population centered on the south-western end of the county in Harrisburg gradually gives way to more rural development to the east along the major highways. The northern areas of the county include multiple open spaces including SGL 211, Weiser State Forest, and the Ibberson Conservation Area State Park. This area is predominantly undeveloped or utilized as agriculture land.

The county's location and role as host of the state seat of government have played a significant part in the development of the region. The county encompasses nearly 558 square miles of land, and lies approximately 100 miles west of Philadelphia and 200 miles east of Pittsburgh. Approximately one-fifth (49,528 people) of the county's population of 268,100 people reside in Harrisburg. The area today is the confluence of several interstates and highways, including I-76, I-81, and I-83, as well as numerous state and national highways. The transportation system has helped the area transform from a steel and industrial center into a thriving distribution hub. The county now boasts a strong, diversified economy with major employers including: the state of Pennsylvania, the PSU Milton Hershey Medical Center, the Hershey Company, Tyco Electronics, Pinnacle Health System, Harrisburg Area Community College, Capital Blue Cross, Comcast, and others. The median county income in 2010 was $53,771.

Sources: Dauphin County Government Services, 2013; US Census Bureau 1990-2010

East Hanover Township

East Hanover Township is the third largest township in Dauphin County with 39 square miles of land, of which approximately one-third is occupied by FTIG. The township was created from the division of West Hanover Township into three separate townships in 1842. East Hanover Township is a rural Township where more than 90 percent of the total land area is occupied by farmland, open space, or mountain land. The developed area is concentrated primarily in the small village of Ono and low density residential areas in the central portion of the Township. The township is expected to grow in the future due to growth pressure from the City of Harrisburg 12 miles to the west. The Pennsylvania National Racetrack and recently opened Hollywood Casino (2008) are located within the jurisdictional boundary. These two key tourist destinations are located immediately south of FTIG's southern boundary just beyond Mountain Road and just over five miles from FTIG's cantonment area (the most urbanized area of FTIG).

The two adjacent tourist entertainment facilities draw both visitors and residents from the region as well as northeast states. The 2010 population of 5,718 shows substantial growth from the 1990 population of 4,569.

Sources: East Hanover Township, Dauphin County, PA, 2013; US Census Bureau 1990-2010

West Hanover Township

The township of West Hanover in Dauphin County was established in 1842 as part of the division of the original area township. Like much of the region, the area was established in the early colonial period by Scotch-Irish and German farmers who introduced the farming culture that continues today. The area experienced a loss in population through the 1800s as settlers pushed farther west in search of new farmland. By 1900, the population had dropped to around 1,010 people. The advent of interstate highways in the 1950s and construction of I-81 have brought a continued population increase as the suburbs of Harrisburg expand to the east. Today, most of the population is settled along I-81 and Highway 22 with limited commercial development at the I-81 and Highway 39 interchanges. Most of the outlying land in the township remains agriculture. The 2010 population was 9,343, which is a 53 percent increase from the 1990 population of 6,125. FTIG is located in the northern area of the township.

Sources: West Hanover Township, 2013; US Census Bureau 1990-2010

Study Area Growth Trends

The following section provides a profile of the counties and communities in relation to population growth, housing, median home values, and economic growth trends. This information assists in setting the regional context for the JLUS and the potential impact of compatibility issues. These trends illustrate the type of growth occurring in the region and growth potential for the JLUS study area.

Growth pressures from Harrisburg, expanding tourist destinations, and FTIG's location relative to the I-81 corridor have already begun to contribute to increased residential, commercial, and industrial development in the region, particularly in the southern portion of

Dauphin County and along the 1·81 corridor into Lebanon County. Interstate-81 provides a north-south connection along the Appalachian Mountains and traverses eight Pennsylvania counties, providing not only a means of transit for both intrastate and interstate travel, but also serving as a conduit for growth.

Population

The study area has experienced a population growth rate higher than state averages. As indicated by the population figures in Table 2-1, the only community in the study area that saw a decline in population between the years of 1990 to 2010, was East Hanover Township in Lebanon County. While Lebanon County saw more of its growth in the southern portions of the county, Dauphin County's growth, as exhibited by West Hanover's rate of almost 53 percent, began to expand eastward from Harrisburg towards FTIG. Both counties' growth rates are approximately twice that of the state, indicating that development pressures will continue to be seen in these jurisdictions.

Table 2-1. Study Area Population from 2000 to 2010

Jurisdiction	1990	2000	2010	1990-2010 Change
Pennsylvania	11,881,643	12,281,054	12,702,379	7%
Lebanon County	113,744	120,327	133,568	17%
East Hanover Township (LC)	3,058	2,858	2,801	-8%
Union Township	2,755	2,590	3,099	12%
Dauphin County	237,813	251,798	268,100	13%
East Hanover Township (DC)	4,569	5,322	5,718	25%
West Hanover Township	6,125	6,505	9,343	53%

Source: US Census Bureau, 1990- 2010. Long-Term Population Projections

Population projections for Pennsylvania and its counties are prepared by the Pennsylvania State Data Center (PASDC) and are not available at the township level. Since these population projections were prepared prior to the release of 2010 Census data, populations used for 2010 data sets by the PASDC are also projections based on pre-2010 Census numbers. Table 2-2 shows the populations projections for Pennsylvania, Lebanon County, and Dauphin County as prepared by the PASDC. For comparison purposes, both the pre-2010 Census numbers, as used by PASDC projections, and the 2010 Census numbers are displayed in the table. As a result of the 2010 Census numbers being higher than the numbers used by PASDC, the projections may end up being higher than predicted. According to PASDC, both counties are projected to grow at faster rates than Pennsylvania overall.

Table 2-2. Study Area Population Projections from 2010 to 2030

Jurisdiction	PASDC 2010 Projection (2010 Census)	2020 Projection	2030 Projection	Percent Change Between 2010 and 2030 (Based on 2010 Census)
Pennsylvania	12,540,718 (12,702,379)	12,871,823	13,190,400	5.2% (3.8%)
Lebanon County	122,409 (133,568)	126,069	131,118	7.1% (-1.8%)
Dauphin County	256,070 (268,100)	262,550	269,855	5.4% (0.7%)

Source: Pennsylvania State Data Center, 2010

Housing Trends

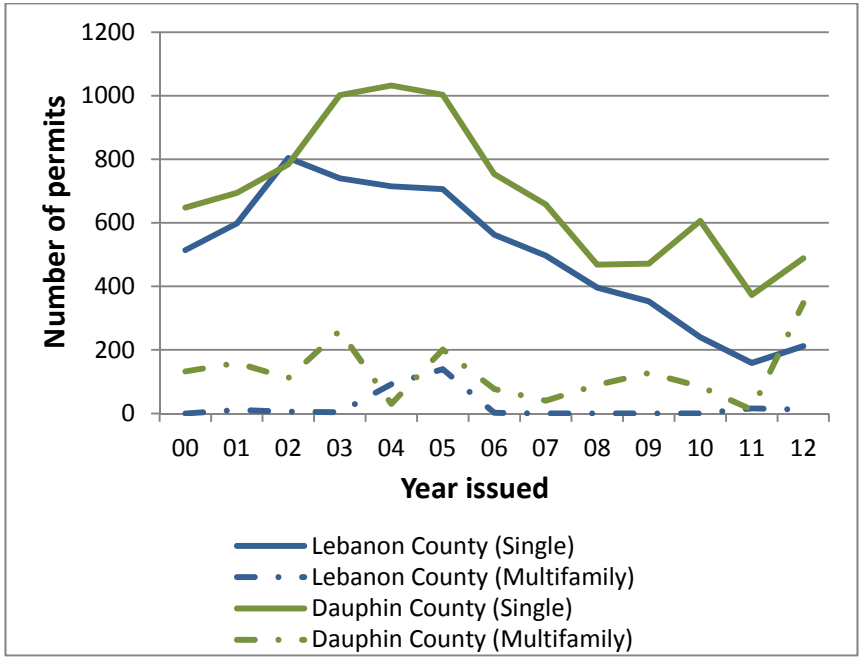
Housing trends are an important indicator of economic activity and vitality, as they demonstrate the population growth or decline relative to new residential construction within an area. They also represent market decisions relative to home ownership versus rental properties. These provide indicators into the affordability of residential dwellings for military personnel associated with an installation. The rate of housing development is a strong indicator of the overall rate of development taking place in a region, which may result in potential incompatible land uses in conjunction with operations at FTIG. Ultimately, housing trends indicate future development and potential for types of residential and commercial development. The following information identifies the housing market trend including the number of existing housing units and construction permits issued at the county level with the study area.

Table 2-3. Existing Housing Units from 2000 to 2010

Jurisdiction	2000 Housing Units	2010 Housing Units	Percent Change from 2000-2010
Pennsylvania	5,249,750	5,567,315	6%
Lebanon County	49,320	55,592	13%
East Hanover Township (LC)	1,091	1,099	1%
Union Township	1,105	1,309	18%
Dauphin County	111,133	120,406	8%
East Hanover Township (DC)	2,043	2,339	14%
West Hanover Township	2,584	3,931	52%

Source: Lebanon County Comprehensive Plan, 2007; US Census Bureau, 2010

As indicated by the data provided in Table 2-3, the growth rate in new housing units in the study area from 2000 to 2010 has been noticeably greater than Pennsylvania overall in every community except for East Hanover Township in Lebanon County. Union Township saw a rate more than three times greater than Pennsylvania and almost 50 percent greater than Lebanon County as a whole. While this is an increase of only 204 housing units, it is in indicator that the township is seeing rapid relative growth. East Hanover and West Hanover townships in Dauphin County both experienced growth rates much higher than the county, indicating an eastward expansion of growth away from Harrisburg. This information is supported by the number of building permits issued by the municipalities as depicted on Graph 2-1.



Source: US Census Bureau 2000-2012

Graph 2-1. Residential Construction Building Permits 2000-2012

Building trends in the study area show growth in the early 2000s followed by a decrease consistent with the national housing recession. Recent growth is evident by an increase in the number of building permits issued, which supports the population growth patterns seen in these counties.

Economic Growth Trends

The primary economic activity throughout the study area is centered on the agriculture industry dating back to the early colonial period. As increasing development pressures have grown from Harrisburg, suburban development has increased, particularly in Dauphin County, bringing both new residents and the local commercial and retail services to support them. The development of major interstates through the region in the post-war years and a change in regional industries has brought increased activity in the manufacturing and transportation of goods through the area. Attractions such as Hershey Park, the Penn National Race Course, and Hollywood Casino and other state parks and open space have brought an increasing tourism base to the region.

Efforts to diversify Harrisburg's economy with new post-industrial sectors have brought substantial growth to the region and Dauphin County in the insurance, healthcare, and retail trade industries. These now represent the largest industries in the county, in addition to hospitality and food services. Lebanon County has leveraged its accessibility to transportation networks to encourage the placement of manufacturing and transportation jobs with firms such as Tyco Electronics and Swift Transportation. While overall employment figures are lower than their pre-recession 2007 highs, growth has occurred in recent years in major sectors of the county's economy such as manufacturing, transportation, healthcare, and hospitality.

Current Development Overview within the Study Area

The majority of the land that surrounds FTIG is rural and composed of agricultural uses, forestland, or low density residential. Further south, approaching Harrisburg, heavier density development occurs in incorporated suburbs. There are some privately-owned properties (inholdings) within FTIG, many with occupied houses.

Development Adjacent to Fort Indiantown Gap

The northern border of FTIG abuts a large swath of land that makes up SGL 211. This land is situated on Second Mountain, which forms the northern border of FTIG. The land is used primarily for conservation and hunting and is home to Bashore Boy Scout Camp and multiple smaller state park facilities.

East of FTIG is Union Township (Lebanon County). I-81 turns north near the southeast corner of FTIG. Land uses on the eastern side of the installation are primarily agricultural and open space, with low density residential and limited commercial and manufacturing throughout. Lickdale Elementary School is approximately one mile from FTIG's boundary at I-81.

I-81 runs along the southern boundary of the FTIG cantonment area. Union and East Hanover (Lebanon County) townships are located south of FTIG's main entrance, with primarily agriculture, forestland, and rural residential land uses. The Hollywood Casino, adjacent racetrack, and the Manada Golf Course are each within half a mile of FTIG's boundary, which may catalyze future development.

The western end of FTIG lies within East Hanover Township (Dauphin County). The land outside the installation is primarily forestland with limited residential and agricultural uses. The area is still several miles from the suburban development associated with Harrisburg.

Vehicle Transportation

The transportation network throughout the study area is influenced by the mountainous regional topography. The FTIG study area is primarily served by two Interstate Highways, and is supplemented by a system of lesser highways and arterial roads. The two primary routes connecting FTIG to other regions are I-81 and I-78. Several US Routes provide alternate coverage to these highways. Since FTIG is an open installation, a road network which traverses the base is publically accessible. The following is a brief description of the major highways in the study area.

- **I-81** – I-81 traverses a portion of the eastern part of the US in a general north-south pattern. Its southern terminus is at I-40 in Dandridge, Tennessee and its northern terminus is on Wellesley Island, New York at the Canadian border where it connects to Highway 401. It serves as a popular trucking corridor and bypass to the I-95 corridor to the east. I-81 runs east-west along the southern border of FTIG and then turns north on the eastern edge of the installation connecting FTIG to Harrisburg to the southwest.
- **I-78** – I-78 is an east-west highway that runs 144 miles from its western terminus connection at I-81 to its eastern terminus at Canal Street in New York City, NY. This highway is also used heavily by truckers, who account for approximately 24 percent of its traffic. I-78 begins just outside the southeast corner of FTIG and travels east, connecting to various cities, including Allentown, PA; Newark, NJ; and New York City, NY.
- **US Route 22** – US Route 22 is an east-west highway that runs from its western terminus in Cincinnati, OH to its eastern terminus in Newark, NJ. It runs parallel to I-81 and I-78 and connects to I-78 east of FTIG. It provides an alternate route for these highways.

Air Transportation

A study of local airports is important when considering the flight operations at FTIG. The closest major airport to FTIG is Harrisburg International Airport (HIA) located in Lower Swatara Township, PA. There are several smaller airports located in the region. These are primarily private or general aviation airports and do not support large or commercial operations. A brief description of the airports within the region is provided below.

- **Bendigo Airport** – Bendigo Airport is a privately-owned public-use airport in Dauphin County that primarily serves Tower City Borough. It is located approximately 10 miles to the north of FTIG. It covers 41 acres and has one runway measuring 2,325 feet long by 60 feet wide.
- **Capital City Airport** – Capital City Airport is a public-use airport located three miles southeast of Harrisburg's central business district in Fairview Township, York County. This regional airport serves Cumberland, Dauphin, and York counties. It is the home airport for the Pennsylvania Bureau of Aviation and the Pennsylvania State Police. It also serves as a reliever airport for HIA. The airport covers 320 acres and has two runways, one approximately 5,000 feet long by 150 feet wide and the other 3,925 feet long by 100 feet wide.
- **Deck Airport** – Deck Airport, located near the Borough of Myerstown in Lebanon County, is a privately-owned airport that is open to the public. The airport encompasses approximately 92 acres and has one active runway measuring 3,786 feet long by 50 feet wide.
- **Grimes Airport** – Grimes Airport is a privately-owned public-use airport in Berks County that primarily serves Bethel Township. It covers an area of 50 acres and has one runway measuring 2,720 feet long by 100 feet wide.
- **Harrisburg International Airport (HIA)** – HIA is a public-use airport located in Lower Swatara Township, nine miles southeast of the City of Harrisburg's central business district. This airport serves as the primary commercial air hub for South Central Pennsylvania and is the third busiest airport in Pennsylvania for both passengers and cargo. The airport covers 680 acres and has one runway that is approximately 10,000 feet long by 200 feet wide. There is one terminal at the airport with 12 gates. The PAANG's 193rd Special Operations Wing is stationed at HIA.
- **Northumberland County Airport** – Northumberland County Airport is located 30 miles north of FTIG. The single runway airport serves Northumberland County aviators and mostly small, private aircraft. The paved runway is 3,297 feet long by 75 feet wide.

- **Pottsville-Schuylkill County Airport** – Pottsville-Schuylkill County Airport is located 20 miles northeast of FTIG along I-81 near the town of Pottsville. The public airport has two runways, a paved one measuring 2,599 feet by 75 feet and a secondary turf runway measuring 2,270 feet by 140 feet.
- **Reigle Field Airport** – Reigle Field Airport is a privately-owned public-use airport in Lebanon County that primarily serves the Palmyra/Hershey area eight miles south of FTIG. It covers 42 acres and has one runway measuring 1,955 feet long by 40 feet wide.
- Numerous privately-owned runways are maintained by farmers for local crop dusting or other associated uses.

Parks and Recreation

Due to the rural nature of the region, there is an abundance of nearby parks and recreational facilities including a school district-wide recreational plan in Northern Lebanon County. Four state parks exist within the JLUS study area: Memorial Lake State Park, Swatara State Park, Ibberson Conservation Area State Park, and Boyd Big Tree Conservation Area State Park. The northern boundary of FTIG is bordered by State Game Lands. These facilities, including those immediately adjacent to FTIG allow for public access onto the installation. Recreational opportunities such as hunting, fishing, and camping are available within FTIG during certain times of the year.

Memorial Lake State Park

Memorial Lake State Park covers 230 acres of land at the base of Blue Mountain in East Hanover Township (Lebanon County) within the boundaries of FTIG. The park offers a variety of recreational opportunities including hiking, fishing, boating/sailing, ice fishing, ice skating, and skiing. The park's namesake, Memorial Lake, covers 85 acres with boat launches, rentals, and mooring facilities.

Swatara State Park

Swatara State Park is located on 3,520 acres of land approximately two miles east of FTIG's Training Corridor, where the majority of FTIG field training takes place. The park is currently an undeveloped part of the Swatara Valley between Blue and Second Mountains and the Swatara Creek. Plans currently exist to provide recreational facilities similar to those offered at Memorial Lake State Park. Hunting is currently permitted at the park. A portion of the Appalachian National Scenic Trail and other local trails cross through this park.

Joseph E. Ibberson Conservation Area State Park

The 803-acre Joseph E. Ibberson Conservation Area State Park is located approximately six miles northwest of FTIG. The original 370-acre area on Peters Mountain contains nearly unbroken forest and serves as a haven for wildlife like forest warblers and other deep woods animals. The additional 433 acres were added on the northern slope of Peters Mountain in April 2012 and features trails that will eventually connect to the nearby Appalachian National Scenic Trail. The primary recreational activities at this park are hunting and hiking. Skiing is permitted in the winter season.

Boyd Big Tree Conservation Area State Park

Boyd Big Tree Conservation Area State Park covers 1,025 acres of land approximately seven miles west of the FTIG perimeter. The park is primarily used for hunting and hiking with guided conservation tours offered.

State Game Lands

A large amount of SGL exists in the vicinity of FTIG. These lands are managed by the Pennsylvania Game Commission for hunting, trapping, and fishing. These lands are usually donated to the Pennsylvania Game Commission or purchased using hunting license monies. They are generally unsuitable for farming or other development. The closest SGL area to FTIG is SGL 211, which borders the entire northern perimeter of FTIG and covers an area of 44,343 acres.

Cultural Resources

FTIG offers a unique cultural outreach to the community with the Pennsylvania National Guard Military Museum and the Indiantown Gap National Cemetery, both located on the installation. The Military Museum offers a collection of items showcasing the state's military history from the Civil War through the 20th century. The Fort Indiantown Gap National Cemetery was established in 1976 as a resting place for American veterans from many eastern states. It encompasses 677 acres and has one of the largest monuments in the DMVA's national cemeteries.

Sources: Pennsylvania Department of Veterans Affairs, 2013; Pennsylvania National Guard Military Museum, 2013

Please see the next page.

3. Military Profile

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Introduction

This chapter provides an overview of the military history and current operations at Fort Indiantown Gap (FTIG). Identifying and describing the various activities performed on the military installation provides valuable insight into the importance of FTIG as a Commonwealth of Pennsylvania and national strategic asset. This information will enable stakeholders to make informed decisions about the future development and economic growth of their communities adjacent and proximate to FTIG, ultimately impacting the continued existence and future role of the facility.

Pennsylvania National Guard

The Pennsylvania National Guard (PNG) comprises both the Pennsylvania Air National Guard (PAANG) and Pennsylvania Army National Guard (PAARNG). The commander of the 19,000-member Pennsylvania National Guard is the Adjutant General. The Adjutant General is responsible for a joint military force (Air Force and Army) that reaches from Joint Headquarters at FTIG to approximately 90 communities across the Commonwealth. FTIG serves as PNG's Joint Force Headquarters.

The National Guard is responsible for both a federal and state mission. The federal mission is to maintain properly trained and equipped units available for prompt mobilization for war, national emergencies, or as otherwise needed. In time of war or national emergency, or in support of any military operation worldwide, the US President has the authority for calling the PNG into action in support of its federal mission.

Pennsylvania units have participated in every conflict America has faced, from the Revolutionary War through Operations New Dawn/Enduring Freedom, as well as ongoing peacekeeping missions in Kosovo, Bosnia, Egypt and elsewhere. Since September 11, 2001, more than 35,000 PNG soldiers and airmen have deployed in support of global contingencies.

In peacetime, the governor serves as the PNG commander-in-chief, exercising control through Pennsylvania's Adjutant General, a state cabinet-level position responsible for command, control, and supervision of National Guard units – Army and Air – allocated to the Commonwealth six state-owned veterans' homes, and programs for Pennsylvania's one million veterans. In the event of natural disaster or civil emergency, the governor may order Guard personnel and equipment into service to assist state and local authorities. The PNG also provides community support through programs such as the counterdrug program, which provides trained people and specialized equipment to assist state and local law enforcement agencies in the fight against illegal drugs.

Fort Indiantown Gap

Base History

Before the acquisition of land comprising FTIG, PNG utilized a 120-acre training site at Mount Gretna in southern Lebanon County. After outgrowing its Mount Gretna training site, the acquisition of land within Dauphin and Lebanon counties for the establishment of a new PNG training site was authorized in 1931. In 1933, PNG performed its first training maneuvers at FTIG, and the military reservation was completed by the Commonwealth of Pennsylvania in 1940. As the threat of World War II began to rise, PNG leased the land to the US Army to serve as a training post. It was leased to the federal government in September 1940 for the cost of $1 million. A massive construction effort began resulting in the completion of the facility with more than 1,400 buildings as well as Muir Army Airfield (MAAF).

On March 3, 1941, the site was dedicated and officially named Indiantown Gap Military Reservation (IGMR). The name was derived from the many Native American villages that were located near the installation and the term "Gap" came from the separation in the Blue Mountains used by travelers as a shortcut to Shamokin. At this time, it was one of the US's busiest Army training camps serving as the staging area for the New York Port of Embarkation. As a result, over 150,000 troops in eight divisions received their final training at IGMR. During World War II, IGMR also served as a German prisoner of war compound and operated a transportation corps training center to educate soldiers serving in port battalions. This included the construction of three dry landships (the S.S. Manada, S.S. Swatara, and S.S. Indiantown) at IGMR for Army Stevedore training.

At the end of World War II, IGMR served as a separation center for officers and enlisted men who were returning from overseas. Over 450,000 troops were demobilized at IGMR to return to civilian life, with a peak rate of more than 1,000 soldiers processed per day. Between the end of World War II and the beginning of the Korean War, IGMR was inactivated as a federal post and control was turned back over to the Pennsylvania National Guard. During the Korean War from 1951 to 1953, the installation served as a training facility for 32,000 troops who were assigned as replacement soldiers in Korea.

The IGMR name was officially changed to FTIG in May 1975. Also in 1975, FTIG hosted refugee resettlement camps, housing more than 20,000 Vietnamese and Cambodian refugees until they could be processed for sponsorship in the United States. In 1980 the Fort again hosted refugee camps for more than 19,000 Cubans who were processed for sponsorship.

The federal US Army Garrison at FTIG was closed in October 1998 as a result of Base Realignment and Closure (BRAC) recommendations. With this next phase of the installation, control was given back to PNG. Today FTIG serves as a National Guard Training Center and is home to the PNG Headquarters.

Economic Impact

Although 52 government-owned dwelling units house approximately 90 residents who work at the installation, most of the personnel employed at FTIG live off-post. Current facilities support a throughput of 8,000 to 15,000 personnel per training event, inactive duty training weekend, or one of 15 annual training periods (typically two weeks). During an average month, approximately 14,750 soldiers are present at FTIG; however, use is noticeably higher during the months of May through September (average 16,000 soldiers/month) than between October and March (average 12,000 soldiers/month). On average, more than 100,000 individual students and trainees rotate through FTIG every year. An additional 1,900 personnel are employed on a full-time basis. These personnel include state and federal civilians, military technicians, members of the Active Guard and Reserve program, active-duty soldiers, and contractor employees and non-Department of Military and Veterans Affairs (DMVA) tenants.

In Fiscal Year 2014, FTIG had an estimated annual economic impact of $573 million comprising payroll disbursements to all employees and installation expenditures. FTIG has historically served as the largest employer in Lebanon County and continues to play a critical role in the local economy.

Installation Setting

The FTIG installation is located on approximately 17,100 acres in the heart of Pennsylvania, within the historic Pennsylvania Dutch country. The installation is approximately five miles wide (north to south) and 11 miles long (east to west). The installation is located within four municipalities in Dauphin and Lebanon counties and bordered by Second Mountain to the north and Interstate 81 (I-81) to the south. Most of FTIG lies in northwestern Lebanon County, with its western portion in eastern Dauphin County. FTIG occupies a portion of both East Hanover and West Hanover Townships in Dauphin County, and Union and East Hanover Townships in Lebanon County.

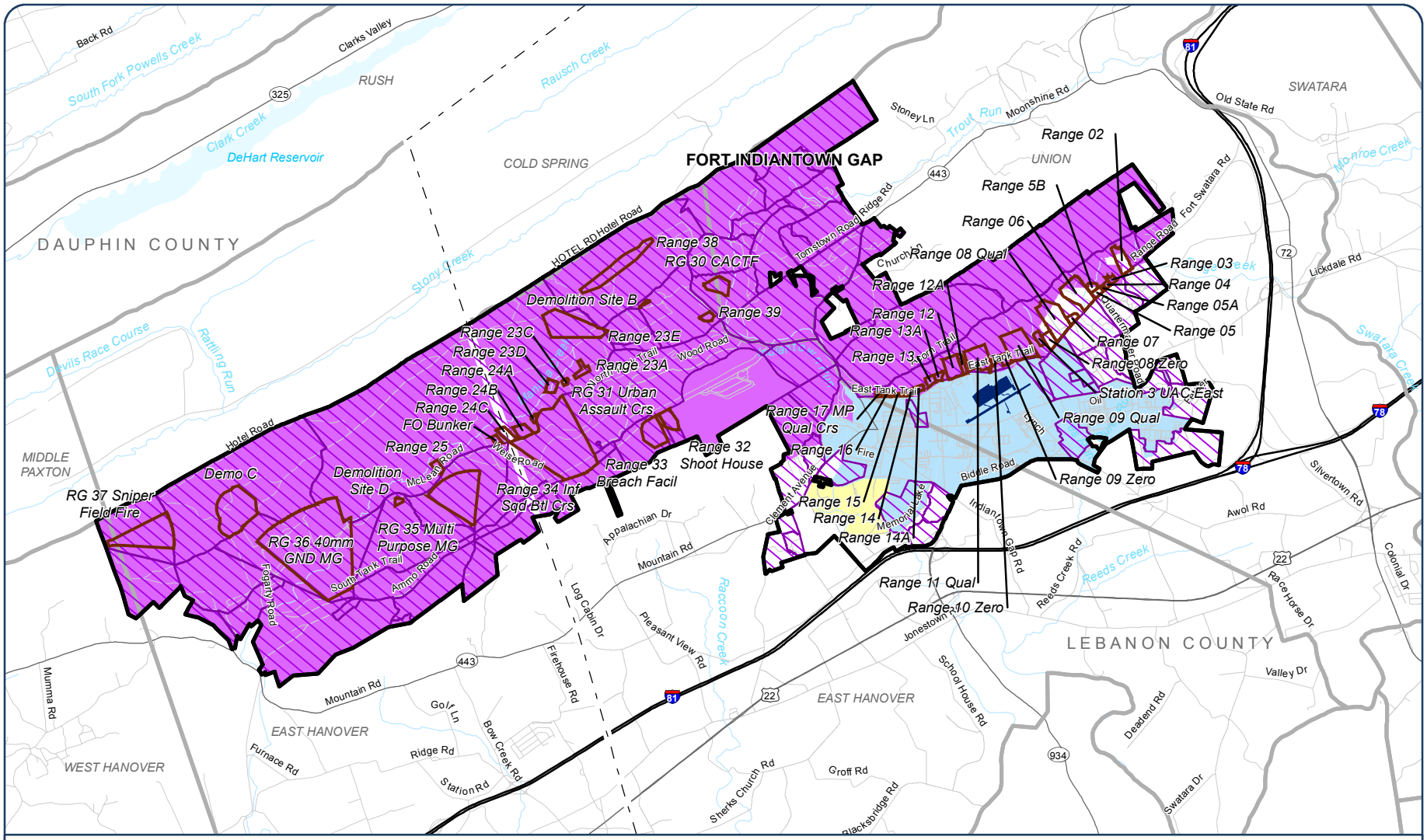
Blue Mountain, the southernmost ridge in the Appalachian Mountains, separates the cantonment area from the training corridor, located in the valley between the summits of Blue and Second Mountains.

Topographically, FTIG is situated within the Appalachian Mountains, nestled between the ridges of Blue Mountain and Second Mountain, which are between 600 to 700 feet above sea level. The installation is composed of two primary areas: the cantonment area and training corridor. These two distinct areas are generally separated by Blue Mountain. The cantonment area contains the developed portions of the installation, while the training areas and bivouac sites are predominantly covered with grassland or hardwood forests. Operational areas including ranges, airfield surface area, and overall training area are illustrated on Figure 3-1.

Cantonment Area

The cantonment area is the more urbanized portion of FTIG, which includes a mix of structures dating from World War II to newly constructed modern buildings. The 2,600-acre cantonment area is located in the southern portion of the installation, separated from the other half of the installation by Blue Mountain to the north and is bounded by I-81 to the south and east.

The cantonment area is divided into functional areas dedicated to specific uses such as operations, education, and maintenance and includes many important facilities, such as operational and administrative buildings, the PNG and DMVA headquarters buildings and support facilities, classroom and educational facilities, dormitories, barracks and lodging, medical clinic, chapel, conference center, shopping and dining options, recreational and athletic facilities. Several training areas (e.g., tank trails, small weapons ranges along Range Road, and bivouac) are also located in this area. Specifically, the Unit Training Equipment Site (UTES), small arms firing ranges, an Unmanned Aerial Vehicle / Unmanned Aerial System (UAS) facility and airstrip, and MAAF are located within the cantonment area.



Legend

- Training Corridor
- Cantonment Area
- Memorial Park
- Airfield Surface Area
- Training Area
- Range Area
- Fort Indiantown Gap
- County Boundary
- Municipalities
- Interstate Highway
- Major Road / Streets
- Local Road
- Water Body
- River / Stream

0 0.75 1.5 Miles

Matrix DESIGN GROUP

Sources: PennDOT, 2013; FTIG, 2013; PASDA, 2013.

Figure 3-1: FTIG Operational Areas

Figure3-1_Op_Areas_20140206_JKC.pdf

Muir Army Airfield

The MAAF is the sixth busiest airport in Pennsylvania and the second busiest heliport in the US when measured in terms of daily takeoffs and landings, averaging more than 70,000 take-offs and landings per year. The primary operations at MAAF are for rotary-wing aircraft. A rotary wing aircraft is an aircraft that derives its lift from the rotation of blades on an approximately vertical central axis such as a helicopter. It supports the Eastern ARNG Aviation Training Site (EAATS), which is the second largest helicopter training facility in the US. The airfield is fully-instrumented and has its own air traffic control tower. Its single runway measures approximately 4,000 feet long; however, an extension to approximately 6,000 feet is currently being explored as part of FTIG's 25-year Real Property Development Plan (RPDP).

Training Corridor

The 12,000-acre training corridor is located north of the cantonment area and is bounded by Second Mountain to the north and Blue Mountain to the south. This is where the majority of the installation's field training takes place with 50 training areas serving various purposes. There are a wide variety of different types of training and facilities located in the corridor used for activities including bivouac, maneuver, vehicle training, unit tactics, convoy training, weapons firing, and air-to-ground weapons firing. The types of training that occur in the corridor include the following:

- **Vehicle maneuver areas.** There are roughly 120 miles of roads and trails throughout the training corridor for both wheeled and tracked vehicles (vehicles that use a continuous band of treads to drive propulsion).

- **The Combined Arms Collective Training Facility (CACTF).** The CACTF is a one kilometer urban village setting that currently contains 12 furnished buildings, a road network, a tunnel/sewer system, and a helicopter landing zone, with an additional eight buildings programmed but currently unfunded. The facility contains video cameras, sound effects, human urban targets, external lighting, break away doors, and hookups on buildings for rappelling, and is capable of daylight and limited visibility training. It assists unit training on entering, clearing, and controlling multiple buildings simultaneously.

- **Urban assault course.** This 28-acre facility is designed for squad- and platoon-sized training in urban fighting techniques. It has five stations: 1) individual and team trainer, 2) squad and platoon trainer, 3) grenadier gunnery ranges, 4) urban offense / defense building, and 5) underground trainer.

- **Live fire shoothouse.** This two-story facility has 11 enclosed rooms where personnel can train in dry, blank, and live-fire room and building clearing techniques. It has video cameras and sound effects and is capable of limited visibility training. The facility features movable walls to customize rooms for the different unit purposes.

- **Live fire breach exercise facility** – This facility, completed in 2010, is designed to train military and civilians on technical aspects of building breaching techniques and provides them with immediate feedback. Breaching techniques are taught for doors, windows, and demolition of concrete or brick structures through the use of mechanical, ballistic, explosive, or thermal breaching means.

- **Live fire infantry squad battle course.** This 1,000-meter course allows units to develop customized starting points and maneuver routes to fit their training needs. Features at the facility include two landing zones, six moving infantry targets, one moving armor target, 20 stationary infantry targets, six stationary armor targets, two trench obstacles, and five machine gun/observation bunkers.

- **Third world villages.** There are three of these villages that simulate economically disadvantaged communities. They are built out of modified shipping containers and offer realistic settings to the urban close combat operations in the real world.

- **MK19/50 caliber firing range.** This range offers automated scoring and qualification.
- **Heavy machine gun range.** This automated range provides zero and qualification training out to 800 meters for the M-240, M-249, and M-60 firearms.
- **Sniper field fire range.** This range offers 1,000 meter known distance targets and includes a remote enhanced targeting system that allows for both 5.56 and 7.62 ammunition.
- **Bollen Air-to-Ground Weapons Range.** The Bollen Air-to-Ground Weapons Range (Bollen Range) is operated by the PAANG. It is located in the training corridor and provides live fire air-to-ground training for aircraft pilots to perform zeroing, familiarization, qualification, and other types of training on a wide variety of different types of aircraft.

Special Use Airspace

Special Use Airspace (SUA) is the airspace where military activity or unusual flight conditions may occur. The designation of SUA serves to alert a nonparticipating aircraft (civilian or military) to the possible presence of these activities. Restricted Airspace's designate where ongoing or intermittent activities occur that create usual and often invisible hazards to aircraft.

Restricted Airspace

Restricted airspace is specifically designated in areas where flight or ground activities must be confined because of their nature, which may be considered hazardous to nonparticipating aircraft. Restricted airspace is bounded by a floor (minimum altitude a plane can fly) and a ceiling (maximum altitude a plane can fly). Restricted airspace is designated under 14 Code of Federal Regulations (CFR) Part 73 and is utilized for hazardous flight activity and aircraft testing including high speed maneuvering, abrupt altitude changes, and other dynamic, non-standard aircraft activity.

Restricted airspace assigned to FTIG is divided into five areas: R5802 A, B, C, D, and E as shown in Figure 3-2. Training activities within the Special Use Airspace include testing, observation, low-altitude exercises, cargo carrying, night operations, water bucket training, and tactical aviation training.

The Restricted Airspace at FTIG covers parts of FTIG including the Training Corridor. Additional areas include approximately 44,000 acres of the State Game Lands located north of FTIG and private property to the north, west, south, and southeast of the installation.

R5802 A

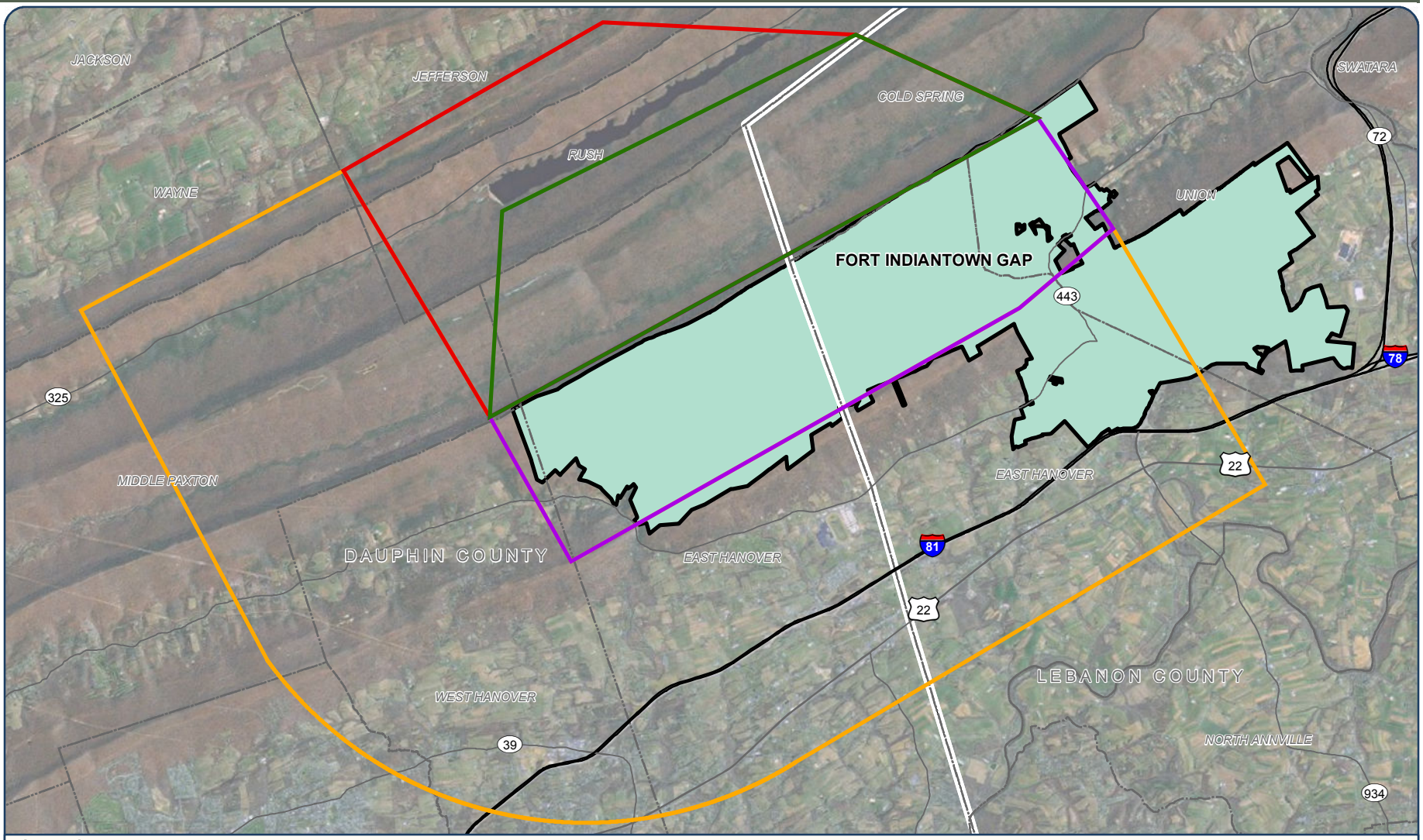
The Restricted Airspace for R5802 A extends north of FTIG onto the State Game Lands area. The airspace has a floor level of 200 feet AGL extending to a ceiling of 5,000 feet AGL.

R5802 B

Restrictions for airspace R5802 B include a floor of ground level to a ceiling of 13,000 feet above MSL. The Restricted Airspace extends southwest over a small quarter mile area off the installation.

R5802 C

Restricted Airspace R5802 C extends approximately 3 miles north from the State Game and Lands area and approximately 10 miles north from the northwest corner of Restricted Airspace R5802 A. This airspace has the same footprint as Restricted Airspace A, B, and D. Restricted Airspace R5802 C has a floor level of 500 feet and a ceiling of 16,999 feet AGL over the training corridor. The Restricted Airspace also comprises of the State Game and Lands area and extends north to the Dehart Reservoir.



Legend

Special Use Airspace

- R5802A – Floor 200 feet AGL to ceiling 5,000 feet AGL
- R5802B – Floor at surface to ceiling of 13,000 feet MSL
- R5802C – Floor 500 feet AGL to ceiling of 16,999 feet AGL
- R5802D – Floor 17,000 feet AGL to ceiling 21,999 feet AGL
- R5802E – Floor 22,000 feet AGL to ceiling 25,000 feet AGL
- Fort Indiantown Gap
- County Boundary
- Municipalities
- Interstate Highway
- Major Road / Streets

0 1 2 Miles

Matrix DESIGN GROUP

Sources: PennDOT, 2013; FTIG, 2013; PASDA, 2013.

Figure3-2_SUA_20150212_JKC.pdf

Figure 3-2: Special Use Airspace

R5802 D

The Restricted Airspace for R5802 D has a floor level from 17,000 feet to a ceiling of 21,999 feet. This airspace is the same footprint as R5802 A, B, and C, and extends off the installation near the southwest corner impacting a small area of approximately half a mile.

R5802E

Restricted Airspace R5802 E extends four miles east and four miles west of R5802 C Restricted Airspace encompassing portions of the State Game and private property including the communities of Grantville and Skyline View , stretching approximately six miles south, four miles east, and two mile north again meeting the southeast corner of Restricted Airspace R5802 D. This airspace has a floor level from 22,000 feet to a ceiling of 25,000 feet AGL.

Military Training Routes

Due to the unique nature of military training and testing requirements, Military Training Routes (MTRs) for special military use have been allocated for FTIG – labeled VR-704, VR-705, and VR-707. These MTRs, controlled and operated by FTIG, are one-way flight corridors used to practice low-altitude, high speed, terrain-following training missions. These MTRs have assigned altitudes of ground level to 18,000 feet AGL for operational speeds in excess of 250 knots. The lateral boundary for these MTRs is 6 nautical miles to the left and right of a 1 nautical mile center corridor, creating a corridor 13 nautical miles in width. Aircraft may freely maneuver within the lateral and vertical confines of the MTR segment or block.

Each MTR is over 200 miles in length – originating in areas of Pennsylvania outside the JLUS Study Area, approaching the Study Area from the north, and terminating in a single corridor at a navigation beacon north of FTIG in in the Greenland area of Weiser State Forest in Dauphin County. Because MTRs are one-way, aircraft track inbound to FTIG along this corridor. The MTRs terminate 6 miles north of FTIG.

Fort Indiantown Gap Mission

The FTIG installation is operated and managed by the FTIG Garrison Headquarters. This office is responsible for administering and managing the training, engineering, administrative, and logistical operations for assigned, attached, transient, tenant units, or joint forces activities at the facility or using facility assets. The installation's primary mission is to provide administrative, logistical, maintenance and family support to active and reserve component units training at the installation, as well as for tenant and off-post activities in central and eastern Pennsylvania. The installation provides training support to the PAARNG, National Guard, Reservists, and members of all services to meet the ongoing need for a highly trained US military presence throughout the world. To meet this mission, training facilities that reflect the diverse conditions soldiers will encounter in war are needed, and soldiers must be trained to adapt to the constantly changing conditions of the areas in which they engage in combat to maintain military readiness and preparedness.

There are four primary missions at FTIG, as follows:

1. To provide a major year-round training facility and the highest-quality training opportunities for the PAARNG and other military and civilian users.
2. To provide the infrastructure, services, and site logistical support necessary to operate training and support facilities.
3. To provide, operate, maintain, and control facilities and equipment that support the pre-mobilization training of military forces.
4. To provide quality of life services and programs and conduct proactive community relations.

Units and Tenants

Headquarters, Pennsylvania Department of Military and Veterans Affairs

The Pennsylvania DMVA is headquartered at FTIG. This department conducts two unique missions: it oversees and supports personnel in the

Pennsylvania National Guard and provides service to Pennsylvania's more than one million veterans and their families. The first mission is accomplished by preparing and supporting the PNG for worldwide combat and providing trained personnel to support state and local authorities during times of civil unrest or natural disasters. The second mission is accomplished by providing resources and assistance to Pennsylvania's military veterans and their families through the provision of quality care for aging and disabled veterans. The Adjutant General, who oversees the Pennsylvania National Guard, is also headquartered at FTIG.

Headquarters, Pennsylvania National Guard

The PNG has a dual mission: 1) to prepare PNG personnel for combat, to perform worldwide combat and combat support operations on a global reach, and the protection of US military power in support of national objectives; and 2) to provide trained and prepared PNG personnel to support state and local authorities in times of natural disasters of civil strife. Both the PAANG and PAARNG are headquartered and based at FTIG. The Deputy Adjutant General -Army is responsible for overseeing the programs and operations of the approximately 15,000 members of PAARNG, while the Deputy Adjutant General- Air does the same for the approximately 4,000 members of PAANG.

The PAARNG Recruiting and Retention Battalion is also headquartered at FTIG and is responsible for maintaining PAARNG strength and force capabilities by recruiting new soldiers into the National Guard, preparing and dispatching them to basic training, and assisting units in retaining qualified soldiers.

Joint Force Headquarters-Pennsylvania (JFHQ-PA)

Joint Force Headquarters Pennsylvania (JFHG-PA) is the headquarters for both the Army and the Air National Guards of Pennsylvania, providing oversight to all the Soldiers and Airmen in the state. JFHQ-PA mission is to maintain trained and equipped forces ready to perform missions as directed by state or federal authorities. The headquarters JFHQ-PA supports Homeland Defense, Defense Support to Civil Authorities, and/or other domestic emergency missions. In addition, the JFHQ-PA provides expertise and situational awareness to Department of Defense authorities to facilitate integration of federal and state activities.

Army

28th Combat Aviation Brigade (28th CAB). The 28th CAB falls under the 29th Infantry Division and serves as a heavy aviation unit for PAARNG. It flies UH-60 Blackhawk, AH-64D Apache, and CH-47F Chinook helicopters. The 28th CAB's primary mission is to find and destroy enemy forces to support its combined arms team, but it is also capable of close combat attacks, mobile strikes, reconnaissance, security, air assault, command and control, aerial medical evacuation, air movement, personnel recovery, downed aircraft recovery, and aerial mine delivery.

Eastern ARNG Aviation Training Site (EAATS). More than 1,500 soldiers, from all 50 US states and four US territories, are trained annually at the EAATS. Students that go through the EAATS include those from the Army, Army Reserves, and various international military students on aircrew qualifications, non-commissioned officer professional education, and enlisted military occupational and additional skill identified training on utility and cargo rotary-wing aircraft. The largest flight aviation simulation complex in the reserve component is located at EAATS and provides virtual simulation and procedure training for the CH-47, UH-60, and UH-72. The facility also includes UH-60 and CH-47 Hardware Maintenance Trainers and Remove and Replace Trainers, and an Aviation Life Support Equipment repair facility.

166th Regiment Regional Training Institute. The 166th Regiment Regional Training Institute is among the largest and most technologically advanced of its kind in the Total Army School System, and one of the largest Non-Commissions Officer Academies in the US Army. It has an average throughput of approximately 6,000 students annually. The Institute operates out of newly constructed campus that includes training areas, dormitories, and dining facilities. Some of the Army career fields that training is provided for include Cavalry scouts, cannon crewmember, fire support specialists, motor transport operators, and Infantrymen.

All Army Sports. The All Army Sports program is a wing of the US Army Morale Welfare and Recreation program. It serves to directly support the readiness and well-being of soldiers. Participants in the All Army Sports program have the opportunity to be selected to represent the US Army in various championship events, both at the national and international level. The All Army Sports camps hosted at FTIG are for women's basketball and softball, and tae kwon do.

Northeast Counterdrug Training Center (NCTC). The NCTC was founded in 1999 and is operated and staffed by the PNG. Its mission is to provide local, state and federal government agencies and community based organizations with quality training and education to enhance their functional capabilities at no cost to the supported organization. The facility has the capabilities to house, feed, and train law enforcement and drug demand reduction professionals at no additional cost to the parent agencies. Professional training is accomplished through classroom and tactical instruction, including the use of two fully-equipped 50-seat classrooms, a High-Risk Entry Facility, a Polygraph Training Center, and field training.

Medical Battalion Training Site (MBTS). The MBTS provides students with real-life battlefield simulations and training for medical emergencies, mass casualty scenarios, and other medical tasks. The state-of-the-art simulation facility includes over 50 human patient simulation devices with simulations conducted through the projection of scenario-driven realistic sounds, scents, climate controls and smoke, and an interactive target system. The facility is available for use by both military and civilian agencies. Training takes place in a variety of settings, including classrooms, a covered urban operations training site, a litter obstacle course, and a simulated residential home. Facilities include the CACTF, which is the largest Military Operations in Urban Terrain (MOUT) training facility at the installation, providing multiple structures with realistic urban operations training for troops.

Regional Training Site Maintenance (RTS-M). The RTS-M is accredited by the US Army Training and Doctrine Command and instructs students in effective and efficient maintenance training. Its mission is to "provide training that will sustain all active component and reserve component soldiers, which enables Armed Forces components to mobilize and deploy units capable of meeting wartime mission requirements on current and force modernization equipment systems in the areas of Logistics / Maintenance training, Military Occupation Skill Qualifier training, Additional Skill Identifier training and Noncommissioned Officer basic and advance courses."

Source: Army National Guard,http://www.arng.army.mil/aboutus/guardtraining/T3BL/Pages/RegionalTrainingSiteMaintenance.aspx

US Army Research Laboratory - Robotics Research Facility. This facility is used in conjunction with the training areas at FTIG to evaluate technologies that result from basic and applied research efforts in autonomous systems for the advancement of machine perception, intelligence, human-robot interaction, and unique mobility.

Air Force

193rd Regional Support Group (RSG). The 193rd RSG is a support unit of the 193rd Special Operations Wing, which is stationed at Harrisburg Air National Guard Base located at Harrisburg International Airport (HIA). This group provides combat-ready Airmen who specialize in civil engineering, communications, and weather operations for worldwide employment.

148th Air Support Operations Squadron. This squadron is part of the 193rd Special Operations Wing. It provides combat-ready Tactical Air Control Parties for combat maneuver units of the 38th Infantry Division including the 56th Stryker Brigade Combat Team.

201st RED HORSE Squadron. The 201st RED HORSE (Rapid Engineer Deployable Heavy Operational Repair Squadron Engineers) is a subordinate of the 193rd RSG. The squadron serves as a rapidly and globally deployable, self-supporting construction team. It also operates the Regional Equipment Operator's Training Site (REOTS) at FTIG. This facility is used to provide proficiency training to the US Air Force and introductory and proficiency training to the ANG and Air Force Reserve on individual

pieces of equipment used for Rapid Runway Repair. The four main pieces of equipment that students are trained on are bulldozer, grader, excavator, and front-end loader. Approximately 1,000 students pass through the program annually.

Lightning Force Academy. The Lightning Force Academy is under the Pennsylvania Air National Guard and trains Active Duty and Air Guard personnel to support the engineering and installation mission. The knowledge that students gain through this program includes project engineering, management, and total project oversight to accomplish the engineering and installation wartime mission. The courses available through the Academy include combat restoration, repair, installation, removal or relocation of communications-electronics equipment.

Joint Forces

Counterdrug Joint Task Force (CJTF). The Pennsylvania CJTF strives to protect Pennsylvania's citizens from illicit drugs and related emerging threats. It has four key missions: 1) Operational support to law enforcement, 2) Drug demand reduction community outreach, 3) Substance abuse / prevention, treatment, and outreach, and 4) Northeast Counterdrug Training Center.

3rd Civil Support Team (CST) and Biological, Radiological/Nuclear, and Explosive Enhanced Response Force Package (CERFP). The 3rd CST provides Pennsylvania and the region with a chemical, biological, radiological, and nuclear response capability in the form of recognition, analysis, prediction, and active monitoring. The CERFP provides search and extraction, decontamination, medical triage, and limited care capabilities in response to chemical, biological, radiological, and nuclear events.

Current Operations

Training occurs throughout approximately 40 training ranges and range facilities that cover roughly 17,000 acres on FTIG. Training activities include firing ranges, maneuver areas, vehicle training, air-to-ground ranges, rotary-wing operations, urban assault courses, and combat simulators. The installation is divided into more than 50 training areas offering specific capabilities and amenities to support the needs of the unit or soldiers training there. The installation offers a wide array of training ranges and facilities, including the CACTF, Urban Assault Course, Live Fire Shoot House, Live Fire Exercise Breach Facility, Infantry Squad Battle Course, Multi-purpose Machine Gun Range, Heavy Machine Gun Range, Sniper Field Fire Course, several zero and qualification ranges for small arms, anti-armor range, demolition sites, drop zones, gas chambers, leaders reaction course, rappel towers, helicopter landing areas, land navigation courses, bridge construction training site, and improvised explosive device defeat lanes.

Maneuver Areas

There are currently 3,133 acres of heavy maneuver training land and 10,523 acres of light maneuver training land at FTIG. Currently, FTIG has no training land for ground forces outside the boundaries of the installation. Live training can be linked to the simulation training using the Fixed Tactical internet (FTI) located in Area 5. The Maneuver Training Center (MTC) also provides extensive simulation capability to battalion, brigade, and division commanders. The MTC is the only facility operated by the National Guard capable of integrating all components of the Army's live virtual constructive gaming training strategy.

Aviation

A fully-instrumented facility with air traffic control, MAAF has a 4,000-foot runway used for rotary-wing aircraft. Night operations are not uncommon; however, public notification is sent out through FTIG's Public Affairs Office (PAO) when either flight training or live-fire exercises will be conducted at night after 2300 hours (11:00 p.m.). Approximately 15 percent of rotary wing operations departing from MAAF fly specific routes at 600 to 800 feet above ground level (AGL) across the installation following State Route 443 on the north side of Blue Mountain [the Northern Training Area, (NTA)]. In addition to the restricted military airspace over FTIG, approximately 44,000 acres of State Game Lands (SGL) to the north support certain flight operations. A secondary airstrip accommodates Unmanned Aerial Vehicle/Unmanned Aerial System (UAV/UAS) flights (drones). New facilities to house several additional UAS platoons with runways for the Army Guard a similar unit for the Air Guard are being planned.

The rotary-wing aircraft represents the vast majority of flight activity or approximately 96 percent of all aircraft operations. Training activities focus on low-altitude flight maneuverability, cargo transport, use of night vision equipment, and tactical maneuverability. The predominant amount of helicopter use is due to the location of the EAATS at FTIG. The helicopter training performed under the purview of EAATS is second only to helicopter training at Fort Rucker, Alabama and serves as the sole training provider for Army Reserve helicopter pilots and maintenance crews. Helicopters involved in the flight training activities include: UH-72, CH-47 Chinook, UH-60 Blackhawk, and, occasionally, UH-1 Iroquois (Huey). The environs within and adjacent to FTIG provide 640,000 acres of flight training area for EAATS training activities.

The flight training area includes closed-loop patterns involving MAAF, training areas and landing zones within the NTA, and flight corridors extending east and north from FTIG into the NTA. The closed-loop patterns involving MAAF are generally contained within the FTIG boundaries with the exception of a small portion that extends into East Hanover Township in Lebanon County and is bounded by I-81. The NTA encompasses an area outside of FTIG that extends from the northwest side of FTIG to the northeast/east side of FTIG comprising SGL and private property; it includes three training areas and 25 landing zones. The entry flight corridor connecting FTIG to the NTA aligns with Route 443 through the FTIG area, then diverts north near I-81, continuing north through Swatara State Park into a large area that includes the Blue Mountain ridgeline. The exit flight corridor connecting the NTA to FTIG departs the Blue Mountain area to the south just east of the Lebanon Reservoir, continues south to an area around Lake Weiss and Lake Strause, and diverts to the west on a course to FTIG immediately south of the Monroe Valley Golf Club.

During closed-loop training activities in and around MAAF, flight levels generally stay in the range of 900 feet to 1,200 feet AGL. Within the NTA, flight operations are contained within an area extending from a floor of 500 feet AGL to a ceiling of 2,000 feet MSL. The exception to the floor of 500 feet is flight over private properties where the floor minimum is 1,000 feet AGL. To reach the NTA, the flight corridors are utilized at a flight level range of 600 feet to 800 feet AGL.

Air-to-Ground Range Operations

The Bollen Range provides pilots with realistic training in attacking ground targets from the air. All fixed-wing bombing and strafing activities are accomplished with inert ordinance; however, some types of training bomb munitions have small propellant charges (equivalent to two shotgun shells) to disperse a marking agent to aid in the scoring process. Consequently, all of the noise associated with fixed-wing operations at the Bollen Range is caused by aircraft operations or by gunfire during strafing. Gun noise associated with attacking is confined to a very narrow corridor over a remote part of the Range.

Rotary air operations are also conducted at the Bollen Range. Rotary operations consist of low-level attacks, less than 100 feet above ground level (AGL) with machine guns, chain guns, or rockets. The dominant sources of noise from the use of Bollen Range are jet and turbo prop aircraft engines. Aircraft accessing FTIG also use local Restricted Airspace. Restricted Airspace in the vicinity of FTIG consists of the Restricted Special-Use Airspace R5802, which is divided into R5802A, R5802B, R5802C, R5802D, and R5802E.

Future Mission Operations

Although no new major missions are currently programmed for FTIG, the recent completion of a 25-year RPDP provides an overview and outlook of the installation's future needs. One major project currently under consideration is the potential extension of the MAAF runway to meet both recently updated specifications and accommodation of potential new missions in the future.

Another proposed addition to FTIG is the construction of a tactical assault landing strip for C-130 aircraft to allow for touch-and-go landings. This landing strip would be located in the training corridor and could open up FTIG for increased operations. Future additional aviation–related activities

include a new UAS facility planned for the northeastern quadrant of FTIG's training corridor.

Operational Footprint

Aircraft Safety Zones

The MAAF is encompassed by standard regulatory Class D airspace; navigation assistance is provided by a non-directional beacon and radar service. Installation airspace usage is generally limited to military flight controlled on a local level by the MAAF control tower. Army regulations require a 3,500-foot safety arc for ammunition supply points, which prohibits any armed aircraft from entering that restricted airspace. Air traffic control personnel are responsible for ensuring this buffer is maintained and that airspace safety protocols for FTIG military operations are followed.

The MAAF has safety zones associated with its runway to limit and guide development and protect the safety of the public and pilots while simultaneously allowing for continued economic growth. The DOD has created safety zones around runways and landing areas based on historical data where an aircraft accident is most likely to occur. These safety zones are Clear Zones, APZ I, and APZ II and are based on the dimensions of the runway. These safety zones are illustrated in Figure 3-3.

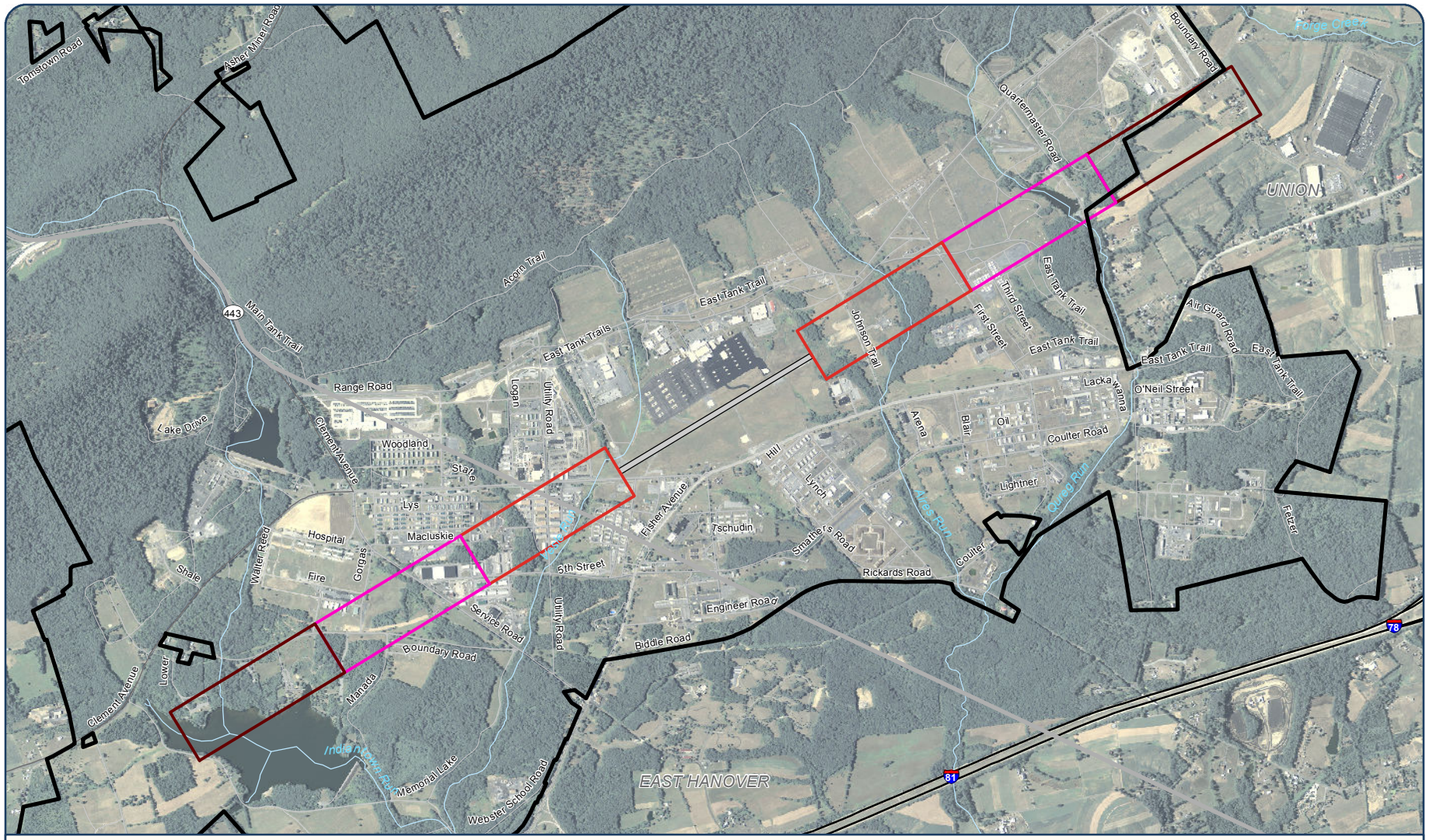
Within these zones, there are restrictions on types, densities, and heights of land uses. For safety reasons, CZs should be entirely clear of any obstructions, whether they are man-made or natural, unless they are necessary for aircraft landing. It is generally the DOD's policy to either acquire the land or a long-term lease or easement, when possible, to prevent any development or growth within these zones. The guidelines for development within APZ I are less stringent than in the CZ, but development should be limited, and residences are generally not recommended. These areas associated with MAAF flight activity are identified as the following.

Runway Lateral Clearance Zone. The runway lateral clearance zone is also referred to as the primary surface. This area extends the entire runway length and 500 feet from each side of the runway centerline. The only permitted land uses include airfield related infrastructure (i.e., taxiways, aprons, antennae, beacons).

Clear Zone (CZ). The CZ is centered on the threshold of the runway centerline and extends 3,000 feet in length. Equal to the runway lateral clearance zone primary surface width, the CZ extends 500 feet on each side of the runway centerline. The total footprint for the CZ surface is 3 million square feet (sf) (3,000 feet x 1,000 feet), or approximately 69 acres. In addition, the initial 1,000-feet x 1,000-feet portion of the CZ extending from the runway centerline threshold requires grading not to exceed a slope of two percent. Permitted land uses within this zone are substantially limited and include transportation, communication, and utilities infrastructure, as well as agriculture, unoccupied open space and surface water features.

Accident Potential Zone (APZ) I. APZ I is located adjacent to the CZ boundary and extends for a length of 2,500 feet. The surface dimensions are positioned relative to the runway centerline, and the total footprint for the APZ I surface is 2.5 million sf (2,500 feet x 1,000 feet), or approximately 57 acres. This area typically experiences less accidents than the clear zone; therefore, has less restrictions imposed. Permitted land uses within this zone include non-occupied structures, i.e., residential land uses are prohibited.

Accident Potential Zone II. APZ II begins at the out boundary of APZ I and extends for a length of 2,500 feet. The surface dimensions are positioned relative to the runway centerline and covers a total footprint of 2.5 million sf (2,500 feet X 1,000 feet), or approximately 57 acres. The APZ II is where development is the least restricted due to risk of accidents being less as it is further from the runway. Warehouse and maintenance facilities are permitted within the footprint, as well as single family residential properties up to two dwelling units per acre maximum, as recommended by DOD AICUZ guidelines for APZ II.



Legend

Safety Zone (Existing Runway)	Runway	Interstate Highway
Clear Zone	Fort Indiantown Gap	Major Road / Streets
APZ I	County Boundary	Local Road
APZ II	Municipalities	River / Stream

0 0.25 0.5 Miles

Matrix DESIGN GROUP

Sources: PennDOT, 2013; FTIG, 2013; PASDA, 2013.

Figure 3-3: MAAF Safety Zones

Figure3-3_Muir_SafetyZones_20150227_CJM.pdf

Imaginary Surfaces

The Department of Defense (DOD) has developed criteria which describe distances from airport and heliport sites, limiting the height of buildings, structures, or objects as to not interfere with aircraft takeoff and landing operations. These areas within which heights of objects are suggested are referred to as imaginary surfaces. Imaginary surfaces define volumes of airspace that must remain free of obstructions to air navigation in order to maintain safety of flight in the airspace around the airfield.

The imaginary surfaces of an active runway are used to determine where vertical obstructions could exist in the vicinity of aviation operations. The various imaginary surfaces build upon one another and are designed to eliminate obstructions to air navigation and operations, either natural or man-made. The extent or size of an imaginary surface depends on the type of runway. The key terms related to imaginary surfaces relative to runways are described below and illustrated on Figure 3-4. Figure 3-5 illustrates the three-dimensional relationship of the imaginary surfaces.

- The **Primary Surface** defines the limits of the obstruction clearance requirements in the immediate vicinity of the landing area. It comprises surfaces of the runway, runway shoulders, and lateral safety zones and extends the entire runway length and 500 feet from each side of the runway centerline. Permitted land uses within this zone are severely limited and include only airfield related infrastructure (i.e., taxiways, aprons, antennae, beacons).

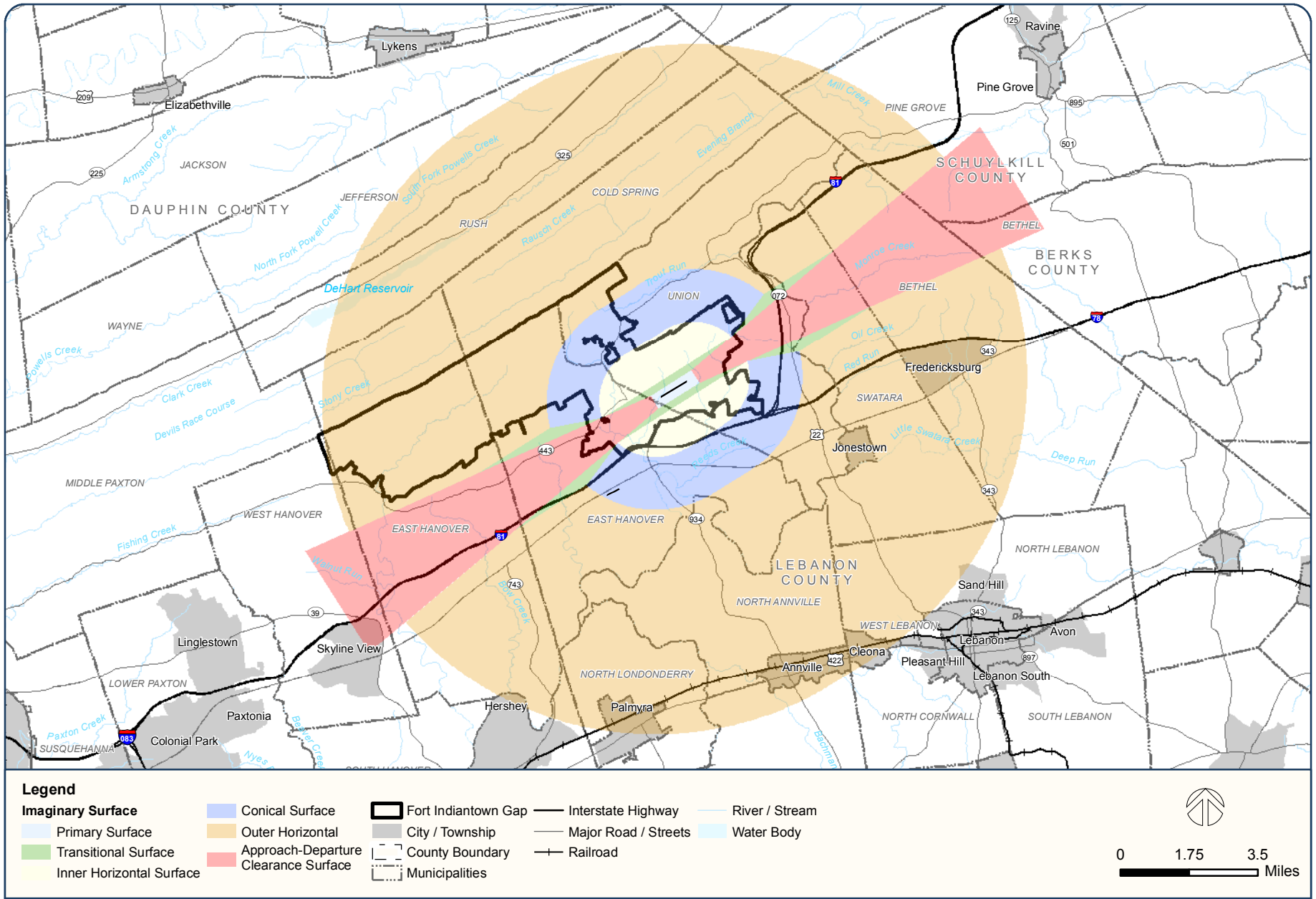
- The **Approach-Departure Clearance Surface** defines the limits of the obstruction clearance requirements in the vicinity contiguous to the end of the primary surface. For the MAAF runway, this surface is centered on the threshold of the runway centerline and extends 3,000 feet in length. Equal to the runway lateral clearance zone primary surface width, it extends 500 feet on each side of the runway centerline.

- The **Transitional Surfaces** connect the primary surfaces, Clear Zone surfaces, and approach-departure clearance surfaces. This surface extends parallel to the distance between each runway threshold. The slope of the transitional surface is 7:1 outward and upward at right angles to the runway centerline, meaning that building heights are restricted in this area to a ratio of one vertical foot for every seven horizontal feet extending perpendicular from the primary surface boundary. At 350 horizontal feet from that boundary, the maximum allowable building height is 50 feet (350/7 = 50). There is no restriction on permitted building type, provided the structure is compliant with this constraint. However, the Air Traffic Control Tower (ATCT), regardless of its height, must be located a minimum 1,000 feet perpendicular to the runway centerline to maintain line-of-sight requirements.

- The **Inner Horizontal Surface** is an oval plane at a height of 150 feet above the established airfield elevation. The inner boundary intersects with the approach-departure clearance surface and the transitional surface. The outer boundary is formed by scribing arcs with a radius 7,500 feet from the centerline of each runway end and interconnecting these arcs with tangents.

- The **Conical Surface** is an inclined imaginary surface extending outward and upward from the outer periphery of the inner horizontal surface for a horizontal distance of 7,000 feet to a height of 500 feet above the established airfield elevation. The slope of the conical surface is 20:1. The conical surface connects the inner and outer horizontal surfaces.

- The **Outer Horizontal Surface** is located 500 feet above the established airfield elevation and extends outward from the outer periphery of the conical surface for a horizontal distance of 30,000 feet.



Matrix DESIGN GROUP

Sources: PennDOT, 2013; FTIG, 2013; PASDA, 2013.

Figure3-4_ImaginarySurfaces_20150112_JKC.pdf

Figure 3-4: Imaginary Surfaces

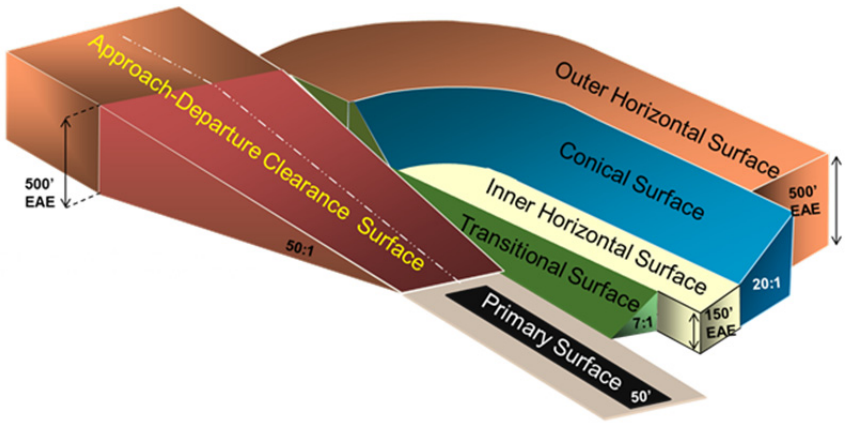


Figure 3-5. 3-D Graphic of Imaginary Surfaces

Associated with the imaginary surfaces of an active airfield and in relation to flight operations from an airport (military or civilian), vertical obstructions are assessed through compliance with Federal Regulation Title 14 Part 77, which establishes standards and notification requirements for objects affecting navigable airspace. Commonly referred to as Part 77 compliance, this regulation provides details to evaluate the potential for a vertical obstruction based on the elevation of the airfield, the height and resulting elevation of the new structure or facility, and the location of the structure or facility in relation to the airfield in question. This regulation is discussed in greater detail in Chapter 4.

Surface Danger Zones

Department of the Army (DA) Pamphlet (PAM) 385-63 Range Safety, provides implementation guidance including standards and procedures for the safe firing of munitions and demolition for training and target practice. This guidance includes requirements for establishing surface danger zones (SDZs) associated with the types of range activities conducted. Live-fire maneuver areas requiring multiple or composite SDZs must be constructed on the basis of each weapon, ammunition, and target engagement scenario.

An SDZ is an area around a weapons firing range from which the access of all military personnel and civilians is restricted due to the inherent dangers associated with the firing of live munitions. An SDZ can include the surface (and subsurface) of land and water, and the overhead air space which provides the medium for launched projectiles. An SDZ typically includes the weapons firing position, target impact area and a secondary buffer area, which is an additional distance where errant projectile/munitions fragments may land without risking harm to life or property. The area of a SDZ can vary in size and shape and is specifically dependent on the type of weapon(s) fired, their firing location and projectile trajectory.

There are multiple SDZs at FTIG associated with the range firing areas throughout the 12,000-acre training corridor. All of the SDZs are contained within the FTIG boundary consistent with the provisions of DA PAM 385-63 which stipulates that no part of the SDZ may leave the installation property.

Noise

The primary sources of noise at FTIG include training for tank, artillery, and mortar crews; air-to-ground gunnery and bombing from aircraft; detonation of demolition ordnance; helicopter flights; fixed wing aircraft flight; small arms training; and heavy equipment, tracked vehicle training, and other vehicular noise sources.

Noise Zones

The Army uses a series of noise zones to identify noise levels associated with military operations and what types of land uses should be allowable or not recommended within the specific zones. Army Regulation (AR) 200-1 lists housing, schools, and medical facilities as examples of noise sensitive land uses, which are identified as land uses that are acceptable within the Noise Zone I, normally not recommended in Noise Zone II, and not recommended in Noise Zone III.

The Army utilizes four noise zones:

- **Noise Zone I** is the noise zone that includes all areas in which the PK15(met) decibels are less than 87 (for small arms), the A-weighted

average day night level (ADNL) is less than 65 (for aircraft), and/or the C-weighted average day night level (CDNL) is less than 62 (for large arms and explosions). This area is usually the furthest zone away from the noise source and is generally suitable for all types of land use.

- **Noise Zone II** includes areas where the PK15 (met) decibels are between 87 and 104, the ADNL is between 65 and 75, and/or the CDNL is between 62 and 70. Although local conditions such as availability of developable land or cost may require noise-sensitive land uses in Zone II, this type of land use is strongly discouraged on the installation and in surrounding communities. All viable alternatives should be considered to limit development in Zone II to non-sensitive activities such as industry, manufacturing, transportation, agriculture, and resource protection.

- **Noise Zone III** is the zone located closest to the source of noise. It includes PK15 (met) decibels greater than 104, ADNL greater than 75, and/or CDNL greater than 70. No noise sensitive uses should occur within this area due to the severity of noise.

- There is also a **Land Use Planning Zone (LUPZ)** at the upper end of Noise Zone I and includes areas where the CDNL is between 57 and 62 or the ADNL is between 60 and 65. It does not include land for PK15(met). This zone accounts for variability in seasonal operations where certain times of the year may include greater than normal frequency in operations. Noise sensitive uses are generally acceptable within this area; however, this may vary on a case-by-case basis.

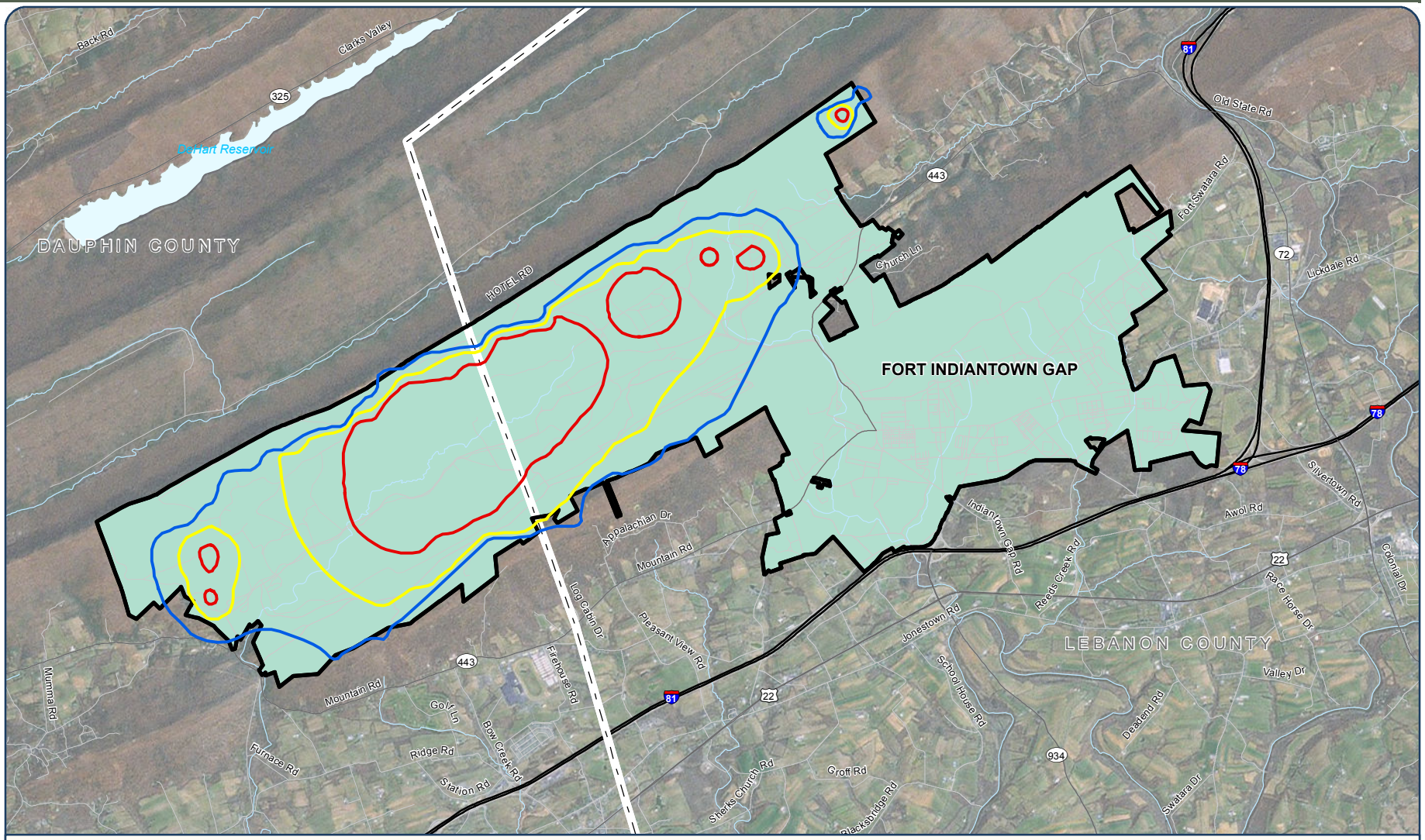
Large Caliber Weapons Noise

FTIG has over 140 specific training facilities available to support individual skills, collective training, drills, and weapons system proficiency testing using up to 155 mm artillery and laser tank gunnery. Large caliber weapons activity takes place in the training corridor. The key ranges and weapons training facilities that are sources of the large caliber noise contours include: 18 field artillery firing points capable of supporting 105 mm and 155 mm artillery, 14 mortar firing points capable of supporting the conduct of fire for mortars from 60 mm through 120 mm and a computerized Multiple Integrated Laser Engagement System (MILES) range. The noise contours in Figure 3-6 are the annual average noise levels , including all demolition activity and firing of weapons that are 20 mm and greater.

The model shows that the annual average noise contours are almost completely contained within the training site; only a small portion of the Zone II and Land Use Planning Zone (LUPZ) extend beyond the western boundary of the installation into undeveloped agricultural land and a single property identified as residential land use. The LUPZ is an area between Zones I and II allowing for greater noise impacts than Zone I, but less noise impacts than Zone II. Noise-sensitive land uses are still generally acceptable within this area. The Zone II noise contours and LUPZ also affect residential inholdings on post. These noise impacts are discussed in greater detail in Chapter 5. Noise Zone III from large caliber firing remains localized to the ranges on post.

Small Arms Noise

Small arms noise is generated by the firing of small caliber weapons (weapons less than 20 mm) and is one of the most common sources of military noise. According to the most recent noise modeling available, Zone III from small caliber firing remains relatively localized to the ranges though small areas exist off post. Zone III extends beyond the installations northern and western boundaries an estimated 300 and 120 meters respectively. Zone II extends beyond the installation's northern, western, and southern boundaries. The impacts on land uses within these noise contours are discussed in greater detail in Chapter 5. Noise Zones due north are based on an overestimation of predicted noise levels. The mountainous topography north of FTIG would minimize the effects of noise, but current small arms noise modeling does not have the capability to account for it. Zone II extends into the residential inholding on post. The combined noise zones for small caliber firing activity are illustrated in Figure 3-7.



Legend

Noise Contour
- LUPZ (52-62 CDNL)
- Zone II (62-70 CDNL)
- Zone III (>70 CDNL)
- Fort Indiantown Gap
- County Boundary
- Water Body
- River / Stream
- Interstate Highway
- Major Road / Streets
- Local Road

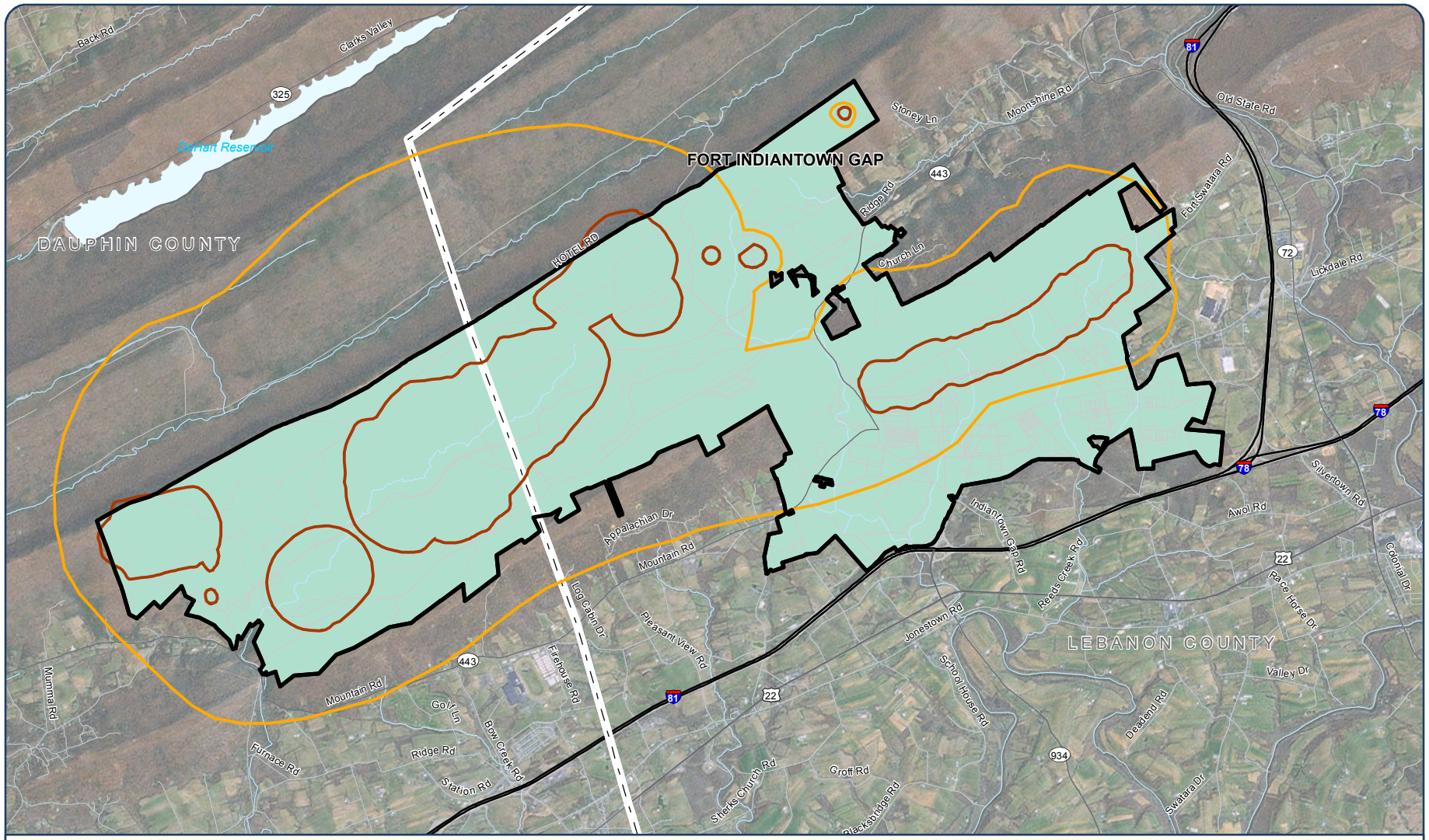
0 0.75 1.5 Miles

Matrix DESIGN GROUP

Sources: PennDOT, 2013; FTIG, 2013; PASDA, 2013.

Figure3-6_LargeCaliber_Noise_20150112_JKC.pdf

Figure 3-6: FTIG Demolition and Large Caliber Operational Noise Contours



Legend

- Noise Zone 2 (62 - 70 CDNL)
- Noise Zone 3 (> 70 CDNL)
- Fort Indiantown Gap
- County Boundary
- Interstate Highway
- Major Road / Streets
- Local Road
- Water Body
- River / Stream

0 0.75 1.5 Miles

Matrix DESIGN GROUP

Sources: PennDOT, 2013; FTIG, 2013; PASDA, 2013.

Figure 3-7: FTIG Small Caliber (Fixed Point) Noise Contours

Figure3-7_SmallCaliber_Noise_20150112_JKC.pdf

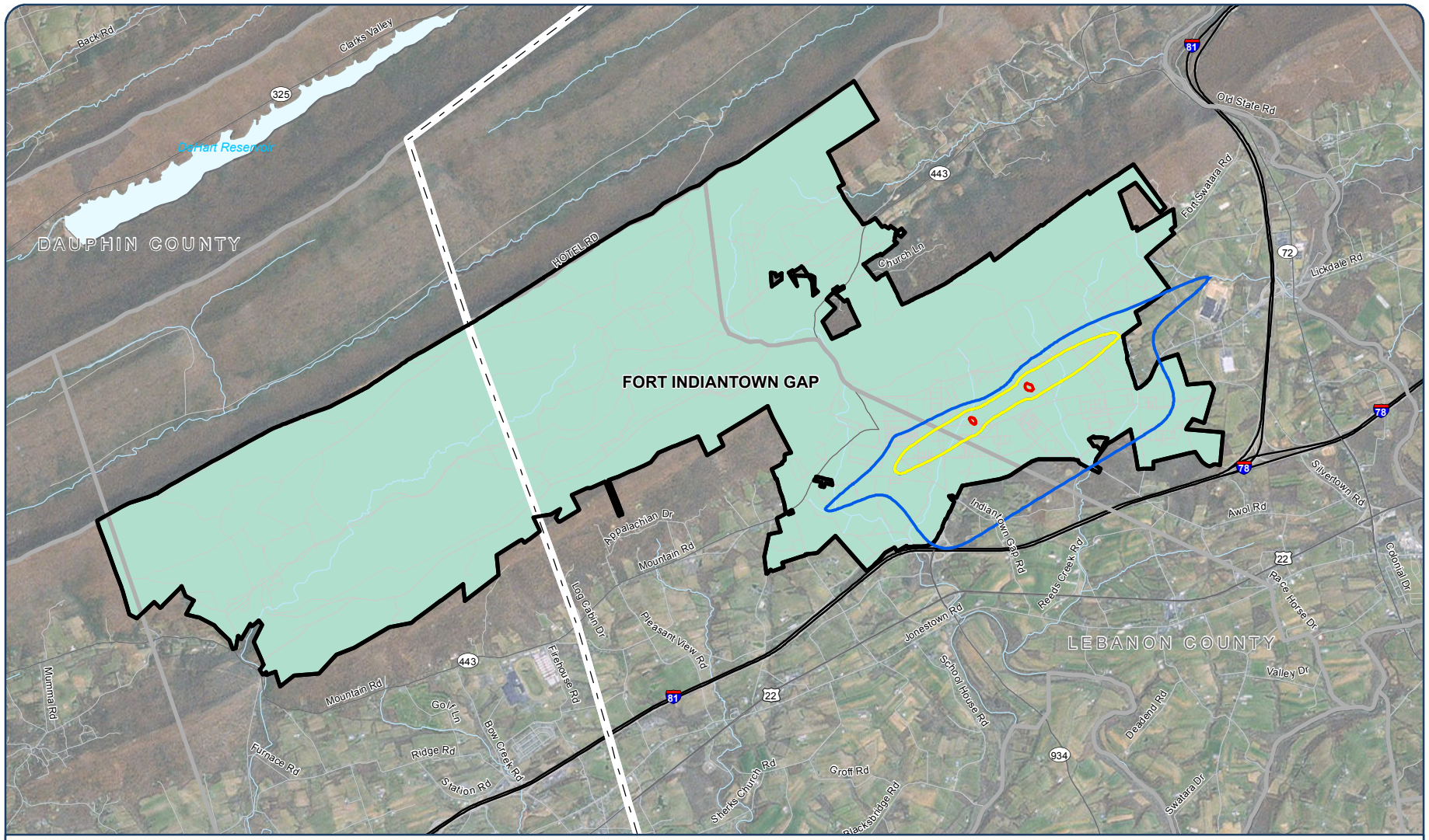
Aircraft Noise

As shown on Figure 3-8, Noise Zones II and III associated with aircraft activity at MAAF are currently contained within the FTIG boundary. The LUPZ (60 ADNL) extends off post primarily into agricultural and wooded areas, but small residential lots are contained within the LUPZ due south of the installation. Additionally, individual overflights have the potential to annoy those living in close vicinity to the flight routes. Because air-to-ground flights are dispersed throughout the Bollen-Air-to-Ground Weapons Range, the level of operations was not high enough to generate a Noise Zone.

Bird / Wildlife Aircraft Strike Hazard

Birds and wildlife can represent a significant hazard to military training and flight operations. Certain types of land uses attract birds and wildlife (i.e., deer) such as standing water and grasslands.

Bird / Wildlife Aircraft Strike Hazard (BASH) constitutes a safety concern because of the potential for damage to aircraft or injury to aircrew or local populations if an aircraft crash were to occur in a populated area. Although aircraft may encounter birds at altitudes of 30,000 feet AGL or higher, most birds fly close to the ground, and over 95 percent of reported bird strikes occur below 3,000 feet AGL. It is important to note that helicopters are less likely than most fixed-wing aircraft to suffer major damage from BASH incidents due to the lower speeds at which they operate. FTIG maintains a rigorous BASH program that seeks to avoid conflict with wildlife and aircraft and minimize bird and other wildlife strikes to aircraft. As a result of the program success, specific BASH locations of concern have not been identified by FTIG.



Legend

Noise Contour
- LUPZ (60-65 ADNL)
- Zone II (65-75 ADNL)
- Zone III (>75 ADNL)
- Fort Indiantown Gap
- County Boundary
- Municipalities
- Interstate Highway
- Major Road / Streets
- Local Road
- Water Body
- River / Stream

0 0.75 1.5 Miles

Matrix DESIGN GROUP

Sources: PennDOT, 2013; FTIG, 2013; PASDA, 2013.

Figure 3-8: MAAF Noise Zones

Figure3-8_MAAF_Zones_20150112_JKC.pdf

4. Existing Compatibility Tools

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Introduction

This chapter provides an overview of compatibility tools currently used or applied in evaluating and addressing compatibility issues in the Fort Indiantown Gap Joint Land Use Study (FTIG JLUS) study area. Relative to compatibility planning, there are a number of existing plans and programs that are either designed to address compatibility directly or that indirectly address compatibility issues through the topics they cover.

This summary provides an overview of key plans and programs that impact compatibility planning organized by level of government. There are three types of planning tools evaluated relative to their applicability: permanent, semi-permanent, and conditional. Permanent planning tools include acquisition programs, either fee simple purchase of property or the purchase of development rights. Semi-permanent tools include regulations such as zoning or adopted legislation. Examples of conditional tools would include memorandums of understanding (MOU), intergovernmental agreements (IGA), and other policy documents such as comprehensive plans (CP) that can be periodically modified. This review is meant to provide an overview of applicable planning tools and determine how each may apply to compatibility as presented under the compatibility factors discussed in Chapter 5. The overview of key plans and programs is organized by level of government in the following order:

- Federal
- Pennsylvania National Guard / Fort Indiantown Gap
- State of Pennsylvania
- Lebanon County
- East Hanover Township (Lebanon County)
- Union Township
- Dauphin County
- East Hanover Township (Dauphin County)
- West Hanover Township
- Other References

Federal

Army Compatible Use Buffer

The Army Compatible Use Buffer (ACUB) program was initiated by the DOD to encourage coordination between military installations and local jurisdictions to address encroachment and conservation concerns. The most recent ACUB plan for FTIG was revised in November 2012. The plans seeks to address growing encroachment concerns as they relate to realistic training opportunities and the continued viability of FTIG as a significant training center for the US Army and the Pennsylvania National Guard.

The 2012 revisions address multiple levels of compatibility, including environmental, noise, and encroachment concerns. Environmental considerations include the Regal Fritillary Butterfly Habitat Study Area, the Kittatinny Ridge Raptor Migration Route, as well as other local and regional species and habitats of concern. The plan also outlines noise management policies in accordance with the Statewide Operational Noise Management Plan adopted in 2006. These programs seek to maximize the amount of land available for training operation while responsibly addressing conservation and potential nuisance concerns. The plan outlines land conservation priority areas to limit development, particularly to the east side of the installation which faces increasing residential development pressures. The implementation of these plans and policies assist in coordinating local and regional compatibility measures around FTIG.

Bird / Wildlife Aircraft Strike Hazard

FTIG prepared a Bird/Wildlife Aircraft Strike Hazard (BASH) plan in 2009 to minimize the threat of bird strikes to aircraft and protect local wildlife. The plan is based on hazards from both resident and seasonal bird populations as well as for other species of wildlife. Implementation of specific actions within the plan is continuous, while other recommendations are implemented as required by bird or other wildlife activity. These measures are especially significant to support helicopter training operations conducted at FTIG. The 2009 plan is designed to increase awareness, promote safety, establish procedures, and increase coordination with other agencies to mitigate bird strike hazards. The plan specifically outlines numerous recommendations for mitigation including:

- Facilities management, including tarmac and turf maintenance guidelines, tree removal, and boundary fence installation.
- Habitat manipulation measures such as wetland removal within the Airport Operating Area, anti-perching devise installation, and nesting prevention.
- Conducting dispersal operations using standard frightening techniques such as bioacoustics, pyrotechnics, gas cannons, or others.
- Training personnel on the Bird Avoidance Model and Avian Hazard Advisory System, flight planning, management and communication procedures, and wildlife discouragement practices.
- Designating airport personnel or contractors to engage in a wildlife control program.

The plan also calls for a Bird Hazard Warning Group (BHWG) and outline their responsibilities while establishing procedure to identify high hazard situations and their mitigation. The BASH plan also addresses procedures for reporting incidents when they do occur. All damaging and non-damaging bird/wildlife strikes are reported to the BHWG using the

Air Force Safety Automated System (AFSAS). When bird/wildlife strikes occur to captive or live munitions (explosive/missiles), these are reported as if the bird/wildlife hit the aircraft.

Chesapeake Bay Protection and Restoration Program

Executive Order 13508 was signed in May 2009 creating a Federal Leadership Committee to oversee the development of planning processes and research centered on preserving and protecting the Chesapeake Bay. The program works as an extension of the Clean Water Act (CWA) in bringing multiple federal agencies together in six states and the District of Columbia to protect the Chesapeake Bay. As part of the headwaters of the Bay, FTIG complies with the plans and policies surrounding water quality and habitat preservation measures outlined in the Chesapeake Bay Action Plan and subsequent Annual Progress Reports.

Clean Air Act

The Clean Air Act (CAA) is the comprehensive federal law that regulates air emissions from stationary and mobile sources in order to control air pollution. Under the CAA, the US Environmental Protection Agency (EPA) establishes limits on six criteria pollutants through the National Ambient Air Quality Standards (NAAQS). Standards are set to protect public health and public welfare. The CAA also gives EPA the authority to limit emissions of air pollutants coming from sources such as chemical plants, utilities, and steel mills. Individual states or tribes may have stronger air pollution laws, but they may not have weaker pollution limits than those set by EPA. Under the law, states have to develop State Implementation Plans (SIPs) that outline how each state will control air pollution under the CAA.

Clean Water Act

The CWA governs the management of water resources and controls and monitors water pollution in the US. It also establishes the goals of eliminating the release of toxic substances and other sources of water pollution to ensure that surface waters meet high quality standards. The CWA prevents the contamination of nearshore, underground and surface water sources.

Department of Defense Conservation Partnering Initiative

In 2003, Congress amended Title 10 U.S.C. §2684a and §2692a (P.L. 107-314), the National Defense Authorization Act, to give authority to the DOD to partner with other federal agencies, states, local governments, and conservation based Non-Governmental Organizations (NGOs) to set aside lands near military bases for conservation purposes and to prevent incompatible development from encroaching on and interfering with military missions. This law provides an additional tool to support conservation and environmental stewardship on and off military installations.

Department of Defense Minimum Antiterrorism Standards for Buildings (UFC 4-010-01)

The DOD published minimum security standards for use in facility and master planning through the Unified Facilities Criteria 4-010-01. The purpose of these standards is to provide appropriate, implementable, and enforceable measures to establish a level of protection against terrorist attacks based on the needed level of protection specific to each facility or installation. Security measures are required for four categories of DOD buildings:

- Inhabited buildings that are routinely occupied by 11 or more personnel at a population density of at least one person per 430 square feet of gross area
- Primary gathering buildings, which are inhabited buildings routinely occupied by 50 or more personnel. All areas of such a facility that meet the population density requirement for an inhabited building must be treated as primary gathering.
- Billeting, in which 11 or more unaccompanied personnel are routinely housed.
- High-occupancy family housing, which has 13 or more units per building.

Security measures required, such as allowable standoff distances, vary for facilities contained within a controlled perimeter and those within an open installation. As defined by the UFC, a controlled perimeter is a physical boundary that possesses sufficient means to channel vehicles to the access control point and where there is a demonstrated capability to search for and detect explosives. Although a controlled perimeter is typically in the form of an installation fence, natural features such as densely wooded terrain or other topographical features that assist in impeding or denying access to an area may qualify as an AT/FP measure.

Endangered Species Act

The Endangered Species Act (ESA) establishes a program for the conservation of threatened and endangered plants and animals and their habitats. The US Fish and Wildlife Service (USFWS) and National Oceanic and Atmospheric Administration (NOAA) are the lead implementing agencies of the ESA. The ESA requires federal agencies, in consultation with the USFWS and/or the NOAA Fisheries Service, to ensure that actions they authorize, fund, or implement are not to impact the existence or harm the habitat of a species listed by the ESA. The law also prohibits any action that causes a taking of any listed species of endangered plant, fish, or wildlife. ESA provides a platform for the protection of critical habitat and species that may be at risk of extinction. This is significant for the protection of the regal fritillary butterfly, which is listed as a species of concern and a critically imperiled subspecies. FTIG encompasses much of the butterfly's current habitat. The installation has established the Regal Fritillary Butterfly Habitat Study Area to monitor habitat preservation and has outlined these practices in the INRMP.

Federal Aviation Act

The Federal Aviation Act (14 CFR Part 77) was passed in 1958 to provide methods for overseeing and regulating civilian and military use of airspace over the United States. The Act requires the Secretary of Transportation to make long-range plans that formulate policy for the orderly development and use of navigable air space. The intent is to serve the needs of both civilian aeronautics and national defense, but does not specifically address the specific needs of military agencies. Military planning strives to work alongside local, state, and federal aviation law and policies but sometimes must supersede these and other levels of government due to national security interests. The Federal Aviation Administration (FAA) was created as a result of the Act for a variety of purposes, including the management of airspace over the US.

The 500-foot rule, promulgated by the FAA, states that every citizen of the United States has "a public right of freedom of transit in air commerce through the navigable air space of the United States". The rule was formally announced in the 1963 Court of Claims ruling of Aaron v. United States and states that flights 500 feet or more above ground level (AGL) do not represent a compensable taking because flights 500 feet AGL enjoy a right of free passage without liability to the owners below.

Another important outcome of the Act is FAA Regulation Title 14 Part 77, commonly known as Part 77, which provides the basis for evaluation of vertical obstruction compatibility. This regulation determines compatibility based on the height of proposed structures or natural features in relation to their distance from the ends of a runway. Using a distance formula from this regulation, local jurisdictions can easily assess the height restrictions near airfields. Additional information on Part 77 is located on the Federal Aviation Administration Internet site at http://www.faa.gov/.

As of January 29, 2013, the main focus of Part 77.17 is to establish standards used to determine obstructions within navigable airspace, typically within a certain distance from an airport or airfield. It defines an obstruction to air navigation as an object that is of greater height than any of the following heights or surfaces in the following manner:

- A height of 499 feet AGL at the site of the object.
- A height that is 200 feet AGL or above the established airport elevation, whichever is higher, within 3 nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length. This height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet.
- A height within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area, which would result in the vertical distance between any point on the object and an established minimum instrument flight altitude within that area or segment to be less than the required obstacle clearance.
- A height within an en route obstacle clearance area, including turn and termination areas, of a federal airway or approved off-airway route that would increase the minimum obstacle clearance altitude.
- The surface of a takeoff and landing area of a civilian airport or any imaginary surface established under 77.19, DOD: 77.21, and heliports: 77.23. However, no part of the takeoff or landing area itself will be considered an obstruction.
    - Except for traverse ways on or near an airport with an operative ground traffic control service furnished by an airport traffic control tower or by the airport management and coordinated with the air traffic control service, the standards of paragraph (a) of this section apply to traverse ways used or to be used for the passage of mobile objects only after the heights of these traverse ways are increased by:
        - 17 feet for an Interstate Highway that is part of the National System of Military and Interstate Highways where overcrossings are designed for a minimum of 17 feet vertical distance.
        - 15 feet for any other public roadway.
        - 10 feet or the height of the highest mobile object that would normally traverse the road, whichever is greater, for a private road.
        - 23 feet for a railroad.
        - For a waterway or any other traverse way not previously mentioned, an amount equal to the height of the highest mobile object that would normally traverse it.

The FAA has identified certain imaginary surfaces around runways that are used to determine how structures and facilities are evaluated to identify if they pose a vertical obstruction in relation to the airspace around a runway. The levels of imaginary surfaces build upon one another and are designed to eliminate obstructions to air navigation and operations, either natural or man-made. The dimension or size of an imaginary surface depends on the runway classification.

Federal Land Management and Policy Act

The Federal Land Management and Policy Act (FLPMA) of 1976 established the authority for public agencies that possess public lands to be managed and planned according to national and local interests. Additionally, the law prescribes that public lands that have been identified for development shall uphold and protect the scientific, scenic, historical, ecological, environmental, and other values that are unique to specific geographies. This law provides the impetus for the various resource management plans that have been developed and prepared for public agencies.

Integrated Cultural Resources Management Plan

Department of Defense Instruction 4715.3, Army Regulation (AR) 200-1 requires installations to develop an Integrated Cultural Resources Management Plan (ICRMP) as an internal compliance and management tool integrating the entirety of the cultural resources program with ongoing mission activities. As a component of the installation master plan, the ICRMP is the PAARNG commander's decision document for conduct of cultural resources management actions and specific compliance

procedures. It also allows for ready identification of potential conflicts between the ARNG's mission and cultural resources, and identifies compliance actions necessary to maintain the availability of mission-essential properties and acreage. The PAARNG most recently updated its ICRMP for FTIG in 2013.

National Environmental Policy Act

The National Environmental Policy Act (NEPA) of 1969 is a federal regulation that established a US national policy promoting the protection and enhancement of the environment and requires federal agencies to analyze and consider the potential environmental impact of their actions. The purpose of NEPA is to promote informed decision-making by making detailed information concerning significant environmental impacts available to both agency leaders and the public. The EIS is a public process that welcomes participation by the community.

All projects receiving federal funding require NEPA compliance and documentation. NEPA is applicable to all federal agencies, including the military. Not all federal actions require a full Environmental Impact Statement (EIS). Actions that may not cause a significant impact result in the preparation of an Environmental Assessment (EA). An EIS is a report that describes and assesses the potential environmental effects of a particular action or project in which the federal government is involved. An EIS for a proposed project outlines in detail the proposed actions, alternative actions, and their probable environmental ramifications. An EA is similar to an EIS but prepared for proposed projects that are more concise and do not require the same level of scrutiny and detail as an EIS.

A NEPA document can serve as a valuable planning tool for local planning officials. An EA or EIS can assist in the determination of potential impacts that may result from changing military actions or operations and their effect on municipal policies, plans and programs, and the surrounding community. Public hearings are required for all EIS documents released under NEPA. An EA requires publishing the draft EA and Finding of No Significant Impact (FONSI) and also allowing public comment for a period of 30 days. An EA can either result in a FONSI or a Record of Decision (ROD) that concludes there will be a significant impact. The information obtained by the EA / EIS is valuable in planning coordination and policy formation at the local government level.

NEPA mandates that the military analyze the impact of its actions and operations on the environment, including surrounding civilian communities. Inherent in this analysis is an exploration of methods to reduce any adverse environmental impact.

National Historic Preservation Act

Issues and related strategies have been developed based on guidance provided through the National Historic Preservation Act (NHPA) of 1966, which requires federal agencies to consider the effects of a proposed project on properties listed in, or eligible for listing in, the National Register of Historic Places. Because no specific action is being proposed as part of this planning process, the review of cultural resources is focused on the identification of existing resources and not potential effects that would result from a specific proposed action.

National Pollutant Discharge Elimination System

Per the CWA, the National Pollutant Discharge Elimination System (NPDES) permit program controls water pollution by regulating point sources that discharge pollutants into US waters. Point sources are discrete conveyances such as pipes or man-made ditches. According to the law, individual homes that are connected to a municipal system, use a septic system, or do not have a surface discharge do not need an NPDES permit; however, industrial, municipal, and other facilities must obtain permits if their discharges go directly to surface waters.

Noise Control Act of 1972

The Noise Control Act of 1972 determined that noise not adequately controlled has the potential of endangering the health and welfare of people. It states that all Americans are entitled to an environment free from noise that can jeopardize their general health and quality of life. Along with state, local, and territorial governments, actions from the federal government were needed to ensure that the objectives of the Act were met.

Concurrently, military installations were experiencing the impacts related to encroaching urban development located adjacent to their boundaries and the resulting complaints regarding noise from military flight operations. The DOD responded by establishing the Installation Compatible Use Zone (ICUZ) program.

The Noise Control Act, as well as the ICUZ program, is important because encroaching development and increased population near military installations often creates compatibility concerns. As communities grow, it is important that the military installation, developers, and the affected communities work together to mitigate the issue of noise and develop ways to coexist compatibly.

Operational Noise Management Program

The ONMP is a program that provides a methodology for assessing impacts of noise generated by military operations on surrounding communities. This program was established by the Department of the Army to assist installations and surrounding communities in the development of guidelines for land use planning to mitigate noise and other hazards to the general public while protecting the public investment in the installation. This program enables compatibility measures for both the U.S. Army and surrounding communities. The most recent ONMP completed for FTIG was in 2012.

Noise is the cornerstone of the ONMP. Noise impacts translate into several zones for which land use planning guidelines are developed to protect the public. The three noise zones for addressing noise sensitive land uses consistent with federal law are:

- Zone I – Noise that occurs in this area is compatible with most noise-sensitive land uses, such as housing, schools, and medical facilities.
- Zone II – Noise occurring in this area is generally incompatible with noise-sensitive land uses.
- Zone III – Noise occurring in this area is incompatible with noise-sensitive land uses.

In addition to these three zones, the ONMP includes a fourth zone known as the Land Use Planning Zone (LUPZ).

Readiness and Environmental Protection Initiative

The Readiness and Environmental Protection Initiative (REPI) program enables the DOD to work with state and local governments, NGOs, and willing landowners to limit encroachment and incompatible land use through land acquisition by the establishment of conservation easements, land trusts, or the purchase of property. The program provides funding to support these land acquisition efforts to preserve the land around military installations, wildlife habitats, and local communities.

The Sikes Act

The Sikes Act requires the DOD to develop and implement Integrated Natural Resources Management Plans (INRMP) for military installations. The INRMPs are prepared in cooperation with the U.S. Fish and Wildlife Service and state fish and wildlife agencies to ensure proper consideration of fish, wildlife, and habitat needs. The Sikes Act requires INRMPs to be reviewed at least every five years by the Service and the states. Army Regulation 200-1, “Environmental Protection and Enhancement”, and policy memoranda guide the ARNG’s implementation of the Sikes Act.

Sustainable Range Program

Encroachment towards Army training and firing ranges has become a major concern in recent years. Pressures from urbanization, environmental protection, competition for airspace and electromagnetic frequencies, and reduced public perception of national security needs have limited mission capabilities and operations at multiple installations nationwide. Open ranges are increasingly becoming “islands” of biodiversity amidst urban development. These issues, in addition to public concern over nuisances such as smoke, noise, and lack of accessibility have led to questions on the nature and use of military ranges.

The Sustainable Range Program (SRP) is the Army’s overall approach to improving the design, operation, use, and management of its ranges to ensure the long term sustainability of these facilities. The Range and Training Land Program (RTLP) and the Integrated Training Area Management (ITAM) Program focus on the doctrinal capability of the Army's ranges and training land. In order to ensure their accessibility and availability, the SRP core programs are integrated with the facilities management, environmental management, munitions management, and safety program functions supporting the doctrinal capability.

United States Fish and Wildlife Service

The ESA is administered by the USFWS and the Commerce Department’s National Marine Fisheries Service (NMFS). The USFWS has primary responsibility for terrestrial and freshwater organisms, while the responsibilities of NMFS are mainly marine wildlife, such as whales, and anadromous fish, such as salmon. Under the ESA, species may be listed as either endangered or threatened. “Endangered” means a species is in danger of extinction throughout all or a significant portion of its range. “Threatened” means a species is likely to become endangered within the foreseeable future. The regal fritillary butterfly is listed as a species of concern by the DOD and critically imperiled subspecies with habitat on the FTIG installation.

When a species is proposed for listing as endangered or threatened under the ESA, USFWS must consider whether there are areas of habitat believed to be essential to the species' conservation. Those areas may be proposed for designation as "critical habitat". The determination and designation of critical habitat is one of the most controversial and confusing aspects of the ESA. A critical habitat designation does not necessarily restrict further development; it is a reminder to federal agencies that they must make special efforts to protect the important characteristics of these areas.

Only activities that involve a Federal permit, license, or funding, and are likely to destroy or adversely modify the area of critical habitat will be affected. If this is the case, USFWS will work with the Federal agency and, where appropriate, private or other landowners to amend their project to allow it to proceed without adversely affecting the critical habitat. Though most federal projects are likely to be approved, some require modification to minimize harm to critical habitat.

Pennsylvania National Guard / Fort Indiantown Gap

Pennsylvania Army National Guard Statewide Operational Noise Management Plan

The Operational Noise Management Program was established by the Army as the framework for the control of noise produced by Army activities in accordance with the Noise Control Act of 1972 which seeks to limit the effects of any activity which may, "present danger to the health and welfare of this Nation's population" (Public Law 92-574 1972). The primary strategy for noise management is the ONMP).

The current ONMP for FTIG was adopted in 2012. Since rotary-wing aviation activities compose a significant training activity at FTIG, route and flight paths are determined with noise management in mind, particularly with regards to residential development near the installation. Additionally, numerous ranges are used for night and day laser tank gunnery, large weapon mortar fire (60mm through 120 mm), 105mm and 155mm artillery fire, small arms, machine gun fire, 40mm grenade launch, blast, high explosives, anti-tank explosives, and ground maneuver training.

The Pennsylvania Army National Guard (PAARNG) ONMP provides a methodology for analyzing noise related to military training operations, educates and discusses noise mitigation measures, noise complaint management procedures, and noise abatement protocol. The PAARNG ONMP outlines land use guidelines for communities to utilize to encourage and support compatibility planning. It also describes the noise environment at FTIG and the use of terrain to mitigate the impacts of noise to off-base land uses. Sources of off-base noise include artillery firing, aerial gunnery, night flying training, and helicopter flights. The plan discusses the installation and the community attitudes towards the installation relative to training exercises and subsequent noise generation. To address noise concerns, the PAARNG ONMP considers areas with noise-sensitive land uses that are exposed to generally unacceptable noise levels which are categorized into three noise zones: Noise Zones III, II, and I.

Encroachment Mitigation / Sustainability Enhancement Assessment and Program Plan for FTIG 2010

The purpose of the Encroachment Mitigation/Sustainability Enhancement Assessment and Program Plan (Sustainability Plan) for FTIG is to provide the Adjutant General of the Pennsylvania National Guard and the Commander and staff of FTIG with courses of action designed to accomplish the following:

1. Effectively respond to current and potential encroachment threats to preserve mission capability, including environmental stewardship responsibilities,
2. Identify appropriate mitigation for potential installation impacts on community or regional resources, and
3. Provide for the mutual exchange of knowledge and information between the installation and the community, in ways that allow and encourage them to work together to develop coordinated responses to controlling encroachment through compatible land use planning and other actions.

Mainly because of FTIG's excellent relationship with neighboring communities, the installation is currently conducting its assigned missions and providing the necessary training opportunities for the Pennsylvania Department of Military and Veteran Affairs (DMVA). In some areas where encroachment threats exist, the installation has mitigation measures in place and is focused on addressing future threats.

The Sustainability Study describes 14 different types of encroachment and suggests likely outcomes if strategies are not developed to address the identified issues. It further suggests that to prevent and manage this potential encroachment threat, it is critical for FTIG to engage with regional stakeholders to acquire land buffers that can be put into compatible use and to work with local governments to encourage the adoption of land use compatibility standards.

Integrated Natural Resources Management Plan

The Sikes Act requires the DOD to complete an INRMP every five years for each military installation to update the needs of local natural resource management policies. INRMPs provide the opportunity for the proper inventory, cataloging, and management of natural resources found on US government managed lands. These policies effect all aspects of an installation's physical environment, including water quality, biodiversity, ecosystem and habitat quality, and mineral resources. They create the opportunity for the DOD and local base commanders at FTIG to work with other federal, state, and local agencies to properly manage significant local resources for the maximization of compatible mixed use.

The most current INRMP for FTIG was completed in March 2002. The INRMP provides an inventory of all natural resource assets associated with the installation and identifies adequate management policies to perpetuate mission capabilities while protecting physical natural resources. The management process includes research, plan development, and the execution of policies which will most benefit the natural resources of the area. Inventories of all types of wildlife and the extents of local ecosystems were catalogued with regular updates.

Special concerns identified at FTIG include the management of both wetland and grassland ecosystems, maneuver damage mitigation, range management, erosion control, deer control, and the protection of threatened species.

Subsequently, FTIG has participated in numerous studies to protect fragile ecosystems and biodiversity found on lands controlled by or located near FTIG training facilities. These programs include:

Regal Fritillary Butterfly Habitat Study Area

FTIG works to manage habitats and allows for military operations to coexist with rare species at FTIG. The regal fritillary butterfly (*Speyeria idalia*) has been listed in the draft DOD Species at Risk guidelines as a species of concern of primary importance to the military mission. This critically imperiled subspecies (T1 rank) has been recommended for Endangered Species Act review. The last remaining populations of the fritillary in the eastern United States are at FTIG and Radford Army Depot, VA. FTIG is the only remaining location that contains a population of the eastern subspecies, *Speyeria idalia*. A 219-acre parcel of prime training area in the heart of the training corridor has been set aside as a Regal Fritillary habitat study area through consultation with the USFWS. The butterflies also attract public attention, and interested visitors are granted access to parts of the installation during the annual butterfly tours which take place during the summer months.

FTIG Deer Management Plan

The FTIG Deer Management Plan was adopted in 2004 and includes area in neighboring Lebanon and Dauphin counties. The white-tailed deer (*Odocoileus virginianus*) populations have greatly increased in recent years due partly to the fragmentation of forestlands from development which has led to a reduction in predators. This has created a need for deer population management policies to reduce ecosystem imbalances, deer population strains, and threats to human safety. Uncontrolled deer populations create a potential safety risk to mobilization maneuvers conducted on FTIG training facilities as well as airfield dangers to helicopter operations. Hunting activities have been permitted as one method of deer management which can create potential compatibility concerns with nonmilitary personnel on the installation. Five separate deer management areas have been established to manage specific deer populations and habitats throughout the installation. The plan also incorporates elements for multiple species management to address other potential biodiversity concerns which may arise.

State of Pennsylvania Departments

Pennsylvania Department of Conservation and Natural Resources

The Pennsylvania Department of Conservation and Natural resources (DCNR) was established in 1995 and is responsible for maintaining and preserving the 120 state parks; managing the 2.2 million acres of state forest land; providing information on the state's ecological and geologic resources; and establishing community conservation partnerships with grants and technical assistance to benefit rivers, trails, greenways, local parks and recreation, regional heritage parks, open space and natural areas. The mission of the DCNR's Conservation Division is to provide natural resource management and support at PNG and activities throughout. One of its major focuses is currently working with FTIG to ensure the long term health, viability, and productivity of FTIG's natural resources in order to continuously improve the training, working, and living environment for soldiers, their families, and the public.

Pennsylvania Department of Military and Veterans Affairs

The Pennsylvania DMVA was initially established in 1793 as the Adjutant General Department, later renamed to the DMVA in 1996. The DMVA is responsible for administering the PNG, which is a component of the DMVA; and administers various programs of assistance to veterans. The DMVA has a dual mission: to provide quality service to the Commonwealth's veterans and their families, and to oversee and support PNG members by:

- Providing resources and assistance to Pennsylvania's nearly one million veterans and their families, and providing quality care for aging and disabled veterans.
- Preparing the PNG for combat, performing worldwide combat and combat support operations, providing global reach and the projection of U.S. military power in support of national objectives; and, at the command of the governor, providing trained personnel to support state and local authorities in times of natural disaster or civil strife.

Pennsylvania State Conservation Commission

The 14-member State Conservation Commission (SCC) is responsible for balancing development with the appropriate management and conservation of the state's natural resources. The department is part of the Pennsylvania Department of Agriculture and works with the Department of Environmental Protection to promote appropriate management techniques. The Commission administers several state conservation programs, which include the Dirt and Gravel Program (focused on pollution prevention), the Nutrient and Odor Management Programs, the Leadership Development Program, as well as the Enhancement and Protection (REAP Tax Credit) Program. The Commission also fulfills liaison responsibilities between federal, state, and local government agencies, industrial organizations, professional associations, and nonprofit groups.

Pennsylvania Department of Transportation

Pennsylvania Department of Transportation (PennDOT) is the state transportation agency responsible for planning, construction, maintenance, and regional coordination of Pennsylvania's roadway infrastructure, including airports, highways, and railways. PennDOT District 8 serves the FTIG JLUS study area. Interstate 81 (I-81) passes east-west through the study area, while several other highways run through the area, including Highway 443, 743, 72, and 325. The 2003 I-81/PA 72 Land Use Study supports the widening of these thoroughfares to support continued growth as the region expands from the nearby state capital at Harrisburg. This study was supplemented by the I-81 Widening Study which was concluded in 2005 to widen the interstate through Dauphin and Lebanon counties.

Pennsylvania State Historic Preservation Office

The Bureau for Historic Preservation is part of the Pennsylvania Historical and Museum Commission and serves as the State Historic Preservation Office (SHPO). The Commission is the Commonwealth's official history agency, and the Executive Director is designated as the State Historic Preservation Officer. The bureau administers the state's historic preservation program as authorized by the Pennsylvania History Code and NHPA.

The role of the bureau is to identify and protect the architectural and archaeological resources of Pennsylvania by working with individuals, communities, local governments, and state and federal agencies to educate the people of Pennsylvania about the State's heritage and its value, to build better communities through preservation tools and strategies, to provide strong leadership, both individually and through partnerships, and to ensure the preservation of Pennsylvania's heritage.

State of Pennsylvania Plans and Programs

Pennsylvania Act 164, Chapter 59, Airport Operation and Zoning

The Commonwealth of Pennsylvania recognizes the need for collaborative land-use management between local communities and transportation entities in order to contain costs and ensure the state's system has room to grow to meet future demand. Pennsylvania's Airport Hazard Zoning law, Act 164 was established to improve and promote land use compatibility with airports throughout the state. Act 164 requires those municipalities that fall within an airport hazard area to adopt, administer, and enforce airport zoning regulations

Pennsylvania validates its commitment to protecting and preserving aviation facilities within the Commonwealth through Act 164, Chapter 59, Airport Operation and Zoning. According to Subchapter B: Airport Zoning §5912 any:

"municipality which includes an airport hazard area created by the location of a public airport is required to adopt, administer and enforce zoning ordinances pursuant to this subchapter if the existing comprehensive zoning ordinance for the municipality does not provide for the land uses permitted and regulate and restrict the height to which structures may be erected or objects of natural growth may be allowed to grow in an airport hazard area".

The Airport Zoning Act addresses the creation of a joint airport zoning board through § 5912(b) stating:

"Where any airport hazard area appertaining to an airport is located outside the territorial limits of the municipality encompassing the airport, all of the municipalities involved may, by ordinance or resolution, create a joint airport zoning board which shall have the same power to adopt, administer and enforce airport zoning regulations applicable to the airport hazard area in question as that vested by subsection (a) in the municipality within which the area is located. Each joint airport zoning board shall have as members two representatives appointed by each municipality participating in its creating and, in addition, a chairman elected by a majority of the members so appointed".

The Airport Zoning Act defines airports that are subject to this regulation as public airports and includes facilities designated as heliports which can be used only by rotary wing aircraft, but it does not address private airports

Revisions in 2000 authorized municipalities to prepare multi-municipal comprehensive plans to guide growth on more of a regional basis by designating growth areas and rural resource areas. Municipalities may enter into intergovernmental cooperative agreements to develop and implement a regional comprehensive plan. The MPC incentivizes jurisdictions to plan regionally with programs such as the sharing of state tax revenue and impact fees with other municipalities in the region, and to adopt transfer of development rights programs. The adoption of a comprehensive plan is mandatory only for counties. Municipalities are encouraged to adopt a comprehensive plan but are not required to do so.

Pennsylvania Agricultural Conservation Easement Purchase Program

The (ACEPP) is a voluntary program which enables willing landowners to sell development rights on viable farmland to government entities. All but 10 counties in the state have active ACEPP programs. The program is based on the purchase of development rights for agricultural property to create agricultural conservation easements throughout the state. As of October 2009, the program had conserved over 425,000 acres from nearly 3,900 farms. Current growth in the program is limited by available government funding, which limits purchases to farms that meet the highest criteria based on soil quality, size, and ownership. The program is overseen by the State Agricultural Land Preservation Board and the Pennsylvania Department of Agriculture.

Pennsylvania Municipalities Planning Code

The Pennsylvania Municipalities Planning Code (MPC) is the state's standard zoning enabling legislation which gives local jurisdictions the authority to engage in zoning and planning processes. The intent of the Pennsylvania Municipalities Planning Code is to help encourage the different municipalities to adopt comprehensive plans and zoning ordinances that reflect the county's plans for consistency. Municipalities are not legally bound by statute to adopt comprehensive plans. Municipalities may adopt zoning ordinances, and they shall be generally consistent with the municipality's comprehensive plan. However, no action of a municipality is considered invalid or can be challenged on the basis that it is inconsistent or fails to comply with a comprehensive plan.

Pennsylvania Statewide Airport System Plan

The Pennsylvania Statewide Airport System Plan (SASP) was carried out in 2002 with updates in 2007 to identify the need and importance of airport hazard zoning to protect the airspace around airports. The Bureau of Aviation (BOA) conducted a statewide Airport Hazard Zoning and Land Use Compatibility Enhancement Study which categorized land uses on and around airports to establish guidelines supporting compatibility planning

around present and future airports and expansions. The project included an update to PennDOT's Airport Land Use Compatibility Guidelines. The project was intended to develop a hazard zoning ordinance for each public airport in Pennsylvania and produce a map of incompatible land use encroachment.

The project represented an opportunity to address the military presence and its air-related facilities at the same time local governments assess their issues with civilian airports. The final report, *Action Plan for Implementing Local Airport Hazard Zoning Ordinances* was issued March 2011. At the time this report was released, only 23 percent of the 680 municipalities required to implement airport hazard zoning had done so. While there are currently no jurisdictions in the JLUS study area required to adopt airport hazard zoning for civilian airports, these specifications may be applied to increase compatibility with flight operations at FTIG.

Lebanon County

Lebanon County is located in southeast central Pennsylvania and contains the majority of FTIG in its northwest area between the Blue and Second Mountains. According to the 2007 comprehensive plan, the county contained 26 municipalities that included 18 townships, seven boroughs, and the City of Lebanon, which is the county seat.

The following is a review of the existing planning tools (policies, programs, and plans) utilized by Lebanon County along with a brief analysis identifying their ability to address land use and military compatibility, and where potential improvements can be made.

Lebanon County Comprehensive Plan

The Lebanon County Comprehensive Plan is the policy document that guides the long range development plans for the county. It sets the goals and objectives upon which the county officials base their development decisions. The 2007 update of the Comprehensive Plan contains elements outlining land use, transportation, community facilities and utilities, economic development, natural resources, open space, historic resources, housing, energy conservation, and regional development. The guidelines outlined in the Comprehensive Plan are important because of their potential impacts on operations at FTIG, which is located largely within the county.

A review of the comprehensive plan has identified the following related to military compatibility:

1. The county cannot require the municipalities to adopt the goals, objectives and policies within the county comprehensive plan—it is only a guidance document. However, if a municipality adopts its own municipal comprehensive plan, it is required by the MPC to be generally consistent with the Lebanon County Comprehensive Plan.
2. Airport hazard zoning is identified as an action for municipalities with aviation facilities only. This action item does not address noise contours and other wider ranging issues outside the boundaries of municipalities with aviation facilities.
3. There are no noise, lighting, frequency or vibration issues associated with compatibility to military missions addressed in the plan.
4. There are no goals, objectives or action items for achieving military compatibility.

Lebanon County Zoning

Most of the municipalities in Lebanon County have adopted their own zoning regulations. The county does not have a separate zoning ordinance that addresses unincorporated municipalities. Thirteen municipalities that have adopted their own zoning regulations rely on the county to enforce these ordinances. Cold Spring Township currently has no zoning ordinance in place.

Lebanon County – Building Code

The building code, or Uniform Construction Code (UCC), is intended to regulate building construction, materials, alteration and occupancy to ensure health, safety and welfare. The building code regulates building construction such that it is compatible with military installations, including sound attenuation for residences within applicable noise zones. Building codes, similar to other regulatory tools, are considered semi-permanent.

Lebanon County's existing building code does not require sound attention for residential uses or public gathering places that are located in areas affected by noise.

In Lebanon County, building codes are adopted at the municipal level. According to the Lebanon County Planning Department, all but 10 of the municipalities within Lebanon County that have adopted the UCC rely on Lebanon County to enforce their building codes. Cold Spring Township has no building code.

Lebanon County – Subdivision and Land Development Ordinance

There are special relationships with counties and municipalities within the state of Pennsylvania. The jurisdiction of a county subdivision and land development (S&LD) ordinance is limited to land in municipalities that have no S&LD ordinance. If a municipality enacts an S&LD ordinance, the county's S&LD ordinance is repealed in that municipality. A municipality may adopt the county's S&LD by reference and by separate ordinance and may designate the county planning agency to administer the ordinance. At present, 13 municipalities are under the county S&LD ordinance, which was last updated in December 2013, and 13 municipalities have their own S&LD ordinance. S&LD ordinances are semi-permanent tools because the S&LD can be amended.

A review of the subdivision regulations has identified the following related to military compatibility:

1. Provisions related to military compatibility, e.g., airport, noise, lighting, vibration or height are not addressed.
2. The requirements do not require the delineation of noise contours, where applicable.
3. The requirements do not require the delineation of aircraft safety zones.
4. The approval process does not require notification to future property owners purchasing land in a subdivision that may be impacted by noise and vibration associated with military operations.

Annville-Cleona Regional Comprehensive Plan

In addition to the Lebanon County planning tools, townships within the region have collaborated to develop and adopt a Regional Comprehensive Plan to guide development in the Annville-Cleona Region. This joint plan encompasses an area of roughly 40 square miles covering Annville Township, Cleona Borough, North Annville Township, and South Annville Township. Each municipality retains the right to control zoning within its jurisdiction, whether through individual zoning ordinances or a joint zoning ordinance. A review of the comprehensive plan has identified the following related to military compatibility:

1. Lighting standards are mentioned as a technique and regional goal and objective to enhance appearances, to control light pollution and protect the night sky, but not in the context of military compatibility.
2. The plan recommends using form-based zoning for height with no specific limitation.
3. The Comprehensive Plan does not acknowledge the Lebanon County plan (which cannot require the municipalities to adopt the county's goals, objectives and policies. Per state planning law, a municipal comprehensive plan need only be generally consistent with its county comprehensive plan.
4. The plan does not address the military presence from a land use compatibility standpoint.

5. There is no discussion regarding noise, lighting, frequency or vibration issues associated with compatibility to the military missions in the plan.
6. Discussion of airports is limited to the appendix and relative to a private airstrip in South Annville Township and two commercial airports located in Harrisburg and Lititz.

East Hanover Township (Lebanon County)

East Hanover Township has utilized the three most common planning tools in Pennsylvania (comprehensive plan, zoning ordinance and subdivision regulations) to achieve its development goals. The following review of the existing planning tools (policies, programs and plans) utilized by the Township provides a brief analysis of the ability of these tools to address land use and military compatibility. The planning tools evaluated are listed below.

East Hanover Township Comprehensive Plan

Lebanon County's East Hanover Township recently (2013) updated its Comprehensive Plan. This plan is the policy document that outlines the township's development and preservation goals and objectives for the next 20 years. The comprehensive plan contains sections for the following elements: proposed future land use, housing, transportation, community facilities, water supply, and natural and historic resources protection. The guidelines outlined in the Comprehensive Plan are important because of their potential impacts on operations at FTIG, which is located in the northern portion of the township.

A review of the comprehensive plan has identified the following related to military compatibility:

1. The plan does encourage the township to adopt zoning regulations (including performance standards) for some issues important to military compatibility such as height, light, noise and vibration. The plan does not address military compatibility.
2. The plan identifies potential zoning overlays, including a historic overlay, steep slope overlay, and streamside (riparian) buffer, but does not specifically mention a military zoning overlay.

East Hanover Township – Zoning

East Hanover Township recently (2013) adopted its own zoning ordinance, and it is administered and enforced by the Lebanon County Planning Department.

1. Provisions related to the administration and enforcement of all building and zoning permits within the township are identified in Article 25 and include the following disclaimer as a requirement:

   "The majority of the lands within the INS – Institutional Zoning District are located within an area where land is used for military operations. Owners, residents, and other users in this district, and in the Township overall, may be subjected to inconvenience, discomfort, and the possibility of injury to property and health arising from normal and accepted military operations and practices including, but not limited to, noise, vibration, odors, dust, the operation of machinery of any kind including aircraft and military vehicles, and the discharge of weapons. Owners, occupants, and users in this district, and in the Township overall, should be prepared to accept such inconveniences, discomfort, and possibility of injury from such military operations, and are hereby put on official notice that Federal and State laws may bar them from obtaining a legal judgment against such military operations."

2. Article 16m, Institutional District contains provisions designed to accommodate the existing state and federally-controlled lands and activities within the township, as well as to provide for similar governmental, recreational and institutional uses that are compatible. Permitted uses include:

- Agriculture, truck farming, gardening, flower and tree nurseries, and commercial greenhouses, but not including animal husbandry or pet kennels.
- Public conservation areas and structures for the conservation of open space, water, soil, forest and wildlife resources.
- Public park and recreation areas, forest preserves, camps, game refuges and similar non-intensive uses.
- Churches and similar places of worship and parish houses.
- Nursery, kindergarten, elementary, middle, and high schools.
- Municipal buildings and community facilities such as police and fire protection facilities, museums, libraries, etc.
- Single-family dwellings.

3. Special exception included as part of Article 16 include:

- Hospitals, nursing, or convalescent homes and cemeteries.
- Non-profit, church related homes for the elderly, including (1) custodial or sanitarium type of care, (2) intermediate care involving dormitory areas with common meal facilities, and (3) individual residential living quarters with separate cooking facilities, provided that the following conditions are met:
- A subdivision and/or land development plan shall be filed in accordance with the governing Subdivision and Land Development Ordinance.
- Self-sufficient dwelling units for permanent guests of the home, which are separate and detached from the principal care facility, shall conform in all respects with the requirements for such dwelling units specified in the RHD - High Density Residential District, including town house and garden apartment requirements where applicable.
- Semi-public and private recreation uses such as golf courses, country clubs, swimming and/or tennis clubs provided that no principal building, accessory structure, pool, tennis court, or parking area is located within 100 feet of any road right-of-way line or lot line.
- Institutions of higher education, convents, and monasteries provided that the following conditions are met:
- A minimum lot area of three (3) acres for the first 300 students or enrollees plus one (1) acre for each additional 100 students or enrollees.
- Dormitory or residential quarters shall be located a minimum of 100 feet from any property line.
- Communications Towers and Antennas
- Where allowed, applications for communication towers are required to comply with all applicable FAA, Commonwealth Bureau of Aviation, and any applicable Airport Zoning Regulations

4. The delineation of noise contours on zoning maps or plan submittals are not required.

5. A Tourism Development Area District has also been established as an overlay district on the Limited Industrial (LI) zoning districts with one of the three purposes being identified as "To provide flexibility in design and use of larger tracts of land within the Township consistent with the goals and objectives of the Township Comprehensive Plan as well as to support the operational mission of Fort Indiantown Gap." Specific requirements or policies associated with how support for FTIG should be carried out are not identified.

East Hanover Township – Building Code

East Hanover Township has adopted the Lebanon County UCC. The Lebanon County Planning Department administers the UCC within its jurisdiction.

East Hanover Township – Subdivision and Land Development Code

Lebanon County's East Hanover Township has not adopted its own S&LD regulations. The Lebanon County Planning Department administers the Lebanon County S&LD ordinance within the township.

Union Township

Union Township has utilized a variety of planning tools to achieve its goals for orderly development and a safe environment for its residents. The following is a review of the existing planning tools (policies, programs and plans) utilized by the township along with a brief analysis identifying their ability to address land use and military compatibility. The planning tools evaluated are listed below:

Union Township – Zoning (2008)

Union Township first adopted its own zoning ordinance in 1976 as amended through 2008. It is administered and enforced by Union Township. A review of the zoning regulations has identified the following related to military compatibility:

1. The code does not define airport and does not include a definition for military airport.
2. Airport safety zones, including the consideration of height and use restrictions or allowances around an airport, are not addressed or defined.
3. Airports are allowed as a special exception in the open space/timberland conservation district meeting certain standards such as (clear zones and height restrictions) and may need to be reconciled with requirements for military airports.
4. The zoning code provides for airport landing strips in the floodplain and floodway districts and may need to be reconciled with requirements for military airports.
5. The zoning code does not require the delineation of noise contours on township maps or on plan submittal maps as applicable.
6. The code allows for the zoning hearing board to grant special exception permission and may determine what is compatible; however, compatibility is not defined or addressed relative to military operations and the military footprint.
7. Telecommunications and broadcast towers are allowed up to 200 feet in height.
8. The code specifies that electromagnetic and electrical interference are not allowed to be produced by any use affecting normal off-site radio, telephone or television reception, but does not specify affecting military operations.
9. Sound/noise attenuation or particular performance standards for noise are not addressed.
10. Permissible height of structures range from 35 feet in the open space/timberland/conservation district to 50 feet in the commercial and industrial districts, and 200 feet for telecommunications towers (may be adjusted for co-locations). Antennas, microwave towers, transmission and radio towers, water tanks and others vertical structures are permitted by special exception.
11. The code does not address the height of a wind energy conversion towers. Telecommunications towers and antenna allowed in the agriculture and open space /timberland/conservation district as special exception.

Union Township – Building (UCC)

Union Township has adopted the UCC and uses a third party to enforce it within the township.

Union Township – Subdivision and Land Development Code

Union Township adopted its own S&LD ordinance in 2001 and administers it within the jurisdiction. A review of the S&LD has identified the following related to military compatibility:

1. Provisions related to military compatibility, e.g., airport, noise, lighting, vibration or height are not included.
2. The delineation of noise contours on zoning maps or plan submittals are not required.

3. Delineation of flight safety zones is not required on zoning maps or development plans.
4. The approval process does not require notification to future property owners purchasing land in a subdivision that may be impacted by noise, vibration, or other compatibility issues associated with proximity to a military installation or airfield
5. Spotlights without attenuated shielding or directional requirements are permitted regardless of location relative to flight paths or airfields.

Dauphin County

Dauphin County is the largest County in the study area and is home to the state capital of Harrisburg. The county contains the western portions of FTIG along its border with Lebanon County. While Dauphin County has experienced significant suburban growth outwards from the capital in recent years, it has long supported mission protection at FTIG.

The following is a review of the existing planning tools (policies, programs and plans) utilized by Dauphin County along with a brief analysis identifying their ability to address land use and military compatibility.

Dauphin County Comprehensive Plan

The Dauphin County Comprehensive Plan is the policy document that guides the long range development plans for the county. It also describes the established criteria and guidelines for the land use regulation and growth policies of the municipalities located throughout the county. The 2008 update of the Comprehensive Plan contains elements outlining historic, cultural, and natural resources; population growth projections, economic development plans; land use policies; housing; transportation; community facilities, services, and utilities; and administration and finance. The guidelines outlined in the general plan are important because of their potential impacts on operations at FTIG.

A review of the Comprehensive Plan reveals the following related to military compatibility:

1. The County cannot require municipalities to adopt the Dauphin County Comprehensive Plan's goals, objectives, and policies of which could impact coordinated compatibility planning and efforts. However, a municipal comprehensive plan must be generally consistent with the Dauphin County Comprehensive Plan.
2. The plan does not address the military presence from a land use compatibility standpoint.
3. While the Comprehensive Plan identifies major regional airports and applies airport-based zoning measures, it does not consider FTIG-based air operations or apply airport compatible zoning to FTIG.
4. The topics of noise, lighting, frequency, or vibration associated with compatibility to the military missions are not addressed in the plan.

Dauphin County/Tri-County Regional Planning Commission Model Zoning Ordinance

The Tri-County Planning Commission is a regional organization that provides planning technical support to Dauphin County. The Tri-County Planning Commission has prepared a model zoning ordinance for use by Dauphin County as well as Perry and Cumberland counties. Although Dauphin County has not adopted the model zoning ordinance and currently has no zoning in place, the model zoning ordinance was made available by Tri-County Regional Planning Commission in 2008.

Though Dauphin County has not adopted the model ordinance, a review for military compatibility was conducted for reference purposes:

1. Within Section 422, Performance Standards for all Uses, references to noise and vibration refer to the "Rules and Regulations" of the Pennsylvania Department of Environmental Protection.

2. Noise standards are provided only for nightclubs and taverns (45 dBA or 5 dBA above the ambient noise levels as measured at front, side and rear property lines), racetracks (80 dB at 100 feet from the racetrack property line), truck stops and motor freight terminals (exterior public address systems not to exceed the ambient noise level as measured at the property lines) and wind energy facilities (55 dBA as measured at the exterior of any occupied building on a non-participating landowner's property).
3. Light and outdoor lighting is defined, but no minimum or maximum height (except for street lights in traditional neighborhood developments which permit a height of 22 feet), or intensity specified, except within conformity with Illuminating Society of North America (IESNA) Lighting Handbook and are not to exceed a one-foot-candle beyond a property line.
4. Signs are allowed to be lighted from the exterior with flood or spot lights.
5. The definition of airport does not differentiate between civilian and military types.
6. In zones allowing airports and heliports, there are no provisions for noise attenuation for surrounding zones or uses.
7. There are no provisions for airport safety zones, accident potential zones, or other hazard areas that may be associated with military activities and airfields.
8. Communications antennae height (except amateur operators at 70 feet and other standard antenna at 15 feet) is not defined, but may be equal to setback and may be higher for colocation.
9. Height regulations do not apply to a variety of "accessory"-type structures, including, but not limited to: water tanks, utility poles, silos and windmills.
10. Building height is allowed to exceed the maximum allowable height by one foot for each additional foot by which the width of each yard exceeds the minimum yard regulation for the district in which the building is located. An overall maximum height is not defined.
11. Building heights allowable range from 2 feet to 60 feet. Commercial recreation and entertainment facilities may be permitted to exceed the maximum, subject to setback equaling height plus 50 feet.
12. Wind turbines are permitted to reach 75 in height; however, this height limitation does not include the measurement of blades/rotors.
13. Waste handling facilities may have a height equal to the setback, though elsewhere the limit is set at 35 feet.

Dauphin County – Building Code

Dauphin County has not adopted nor administers a building code. Each municipality within the county adopts its own building code. Without a building code, it may be more difficult to implement and enforce certain compatibility measures such as sound/noise attenuation county-wide.

Dauphin County – Subdivision and Land Development Ordinance

In 2011, the Dauphin County Board of Commissioners adopted the Dauphin County S&LD Ordinance as authorized by the Pennsylvania Municipalities Planning Code. The 2011 ordinance has been adopted and replaced the 1970 ordinance as amended to reflect the Tri-County Regional Planning Commission Model Subdivision and Land Development Ordinance. In 2011, the Dauphin County Planning Commission authorized the administration of the County S&LD ordinance for seven of its 40 municipalities. The other municipalities have adopted an S&LD ordinance.

While subdivision and land development regulations typically define the standards, procedures and other requirements for subdivision and land development, they also have the ability to serve as a tool to prevent or limit future encroachment onto the installation or adjacent operational areas by specifying what types of infrastructure improvements associated with a subdivision or land development may be or may not be allowable, such as

street lights. By limiting requirements for streetlights, particularly in relation to dark sky provisions, the subdivision and land development regulations can be used as a foundation to ensure mission sustainability. Subdivision and land development regulations are considered semi-permanent planning tools because such regulations provide the regulatory foundation for subdivision and land development only and can be amended at any time by the state or the local jurisdiction.

A review of the subdivision and land development regulations has identified the following related to military compatibility:

1. The regulations in the subdivision and land development ordinance do not include any provisions related to military compatibility, e.g., airport, noise, lighting, vibration, or height.
2. The requirements do not require the delineation of noise contours, where applicable, on zoning maps or development applications.
3. The requirements do not require the delineation of flight safety zones where applicable on zoning maps or development applications.
4. The approval process does not require notification to future property owners purchasing land in a subdivision that may be subject to the effects of military or airport operations such as noise and vibration.

East Hanover Township (Dauphin County)

East Hanover Township in Dauphin County has utilized a comprehensive plan and subdivision regulations to achieve its goals for orderly development and a safe environment for its residents. The following review of the existing planning tools (policies, programs and plans) utilized by the Township gives a brief analysis of their ability to address land use and military compatibility issues. The planning tools evaluated are listed below:

East Hanover Township Comprehensive Plan

The East Hanover Township adopted its current comprehensive plan in 2011. The primary focus of the comprehensive plan is land use; however, recommendations are also included in to guide community efforts through housing, transportation, and community services elements. The planning tools referenced in the comprehensive plan are local ordinances (a zoning ordinance and a subdivision and land development ordinance) which address the use and subdivision of land. The action program within the comprehensive plan identifies recommendations each assigned a time frame or priority, the responsible entities for implementation, and information on potential funding for each.

A review of the comprehensive plan has identified the following related to military compatibility:

1. The plan does not address military compatibility, though it does encourage municipalities to adopt zoning regulations (including performance standards) for some issues important to military compatibility (height, light, noise and vibration).
2. The plan calls for the land in military control to be held in the conservation land use category.

East Hanover Township Zoning Ordinance

East Hanover Township adopted its current zoning code in April 2003. The zoning ordinance is a semi-permanent tool as it can be amended. A review of the zoning regulations has identified the following related to military compatibility:

1. While the zoning ordinance contains regulations for the location of airports and heliports, it does not acknowledge the presence of the military, or require noise contours, safety zones or APZs to be mapped.
2. Sound attenuation is not required and noise standards are for exterior levels generated by the land use.

3. The zoning regulations require radio frequency compliance for telecommunications towers only.
4. Electromagnetic interference requirements address on-site effects only.
5. The height of wind energy conversion systems is only limited to equal the distance to the nearest property line.
6. There are a number of exceptions to the height of structures limited only by the setback to the nearest property line.
7. The height allowed for telecommunications towers is 199 feet. Building height ranges from 35 feet in residential zones to 150 feet height for uninhabitable structures in agriculture zones.
8. Street lighting is required for all streets, though shielding and prevention of upward casting of light is required.
9. Signs are allowed to use flood and spot lights if prevented from of the upward casting of light.

Building Code (UCC)

East Hanover Township (DC) utilizes the UCC, and has made amendments. It is classified as an "opt-in community," and enforces the UCC within its jurisdiction. The same deficiencies are noted in East Hanover Township as with other jurisdictions which adopted the UCC Building Code.

East Hanover Township Subdivision and Land Development Ordinance

The East Hanover Township has adopted its own S&LD ordinance; the latest version is dated April 2003. A review of the S&LD has identified the following related to military compatibility:

1. Compliance with Section 624 is repeatedly mentioned regarding lighting, but there is no Section 624 found within the subdivision regulations.
2. Subdivision regulations cannot be used to control land use, lot size or density.
3. Subdivision regulations do not offer incentives for desired development near military installations.
4. The subdivision regulations do not require the mapping of noise contours, safety zones or APZs.
5. The subdivision regulations do not require disclosure to buyers of the potential effects of being located near a military facility.

West Hanover Township

The West Hanover Township employs a comprehensive plan, zoning ordinance and subdivision regulations to achieve its goals for orderly development and a safe environment for its residents. The following is a review of the existing planning tools (policies, programs and plans) utilized by the Township along with a brief analysis identifying their ability to address land use and military compatibility within the FTIG JLUS area. The planning tools evaluated area listed below:

West Hanover Township Comprehensive Plan

West Hanover Township is in the process of updating its Comprehensive Plan to align the township's comprehensive plan with Dauphin County's comprehensive plan.

West Hanover Township Zoning Ordinance

West Hanover Township adopted its current zoning code in 2000 with subsequent amendments. According to the zoning ordinance, its purpose is to implement the comprehensive plan and to render a legal basis and framework to further the land use plan and development goals established in the comprehensive plan.

A review of the zoning regulations has identified the following related to military compatibility:

1. Defines airport as non-public, but does not include a definition for military airport.
2. Defines airport safety zones as a height and use restricted zoned around an airport providing safe glide paths for aircraft ops.
3. Provides for landing strips in the Floodplain Overlay District.
4. Provides for private, general aviation airports in the Flexible Rural Agriculture, Rural Residential and Commercial Highway districts and may need to be reconciled with requirements for military airports. Does not require safety, APZs or noise contour mapping.
5. Provides for helipads in the commercial, residential, and industrial districts (between 6 a.m. and 9 p.m.) and may need to be reconciled with requirements for military airports. Does not require safety, APZs or noise contour mapping.
6. Does not address land use issues relative to military compatibility.
7. Telecommunications and broadcast towers are allowed in the C, FRA, RR and I districts, and up to 200 feet in height.
8. The code specifies that electromagnetic and electrical interference are not allowed to be produced by any use affecting normal off-site radio, telephone or television reception, but does not specify affecting military operations.
9. Lighting is not prevented from casting light upward or outward, is allowed up to 60 feet with full cutoff and angle less than 90 degrees.
10. Outdoor public recreation lighting allowable at 80 feet height.
11. Does not require sound/noise attenuation and specifies performance standards to be measured at the property line, and specifically exempts fixed wing aircraft.
12. Height of structures range from 35 feet in the conservation, rural residential, medium density residential, neighborhood commercial, interchange, commercial highway, business enterprise, and industrial enterprise districts to 50 feet for gymnasiums as a special exception.
13. The height of a wind energy conversion tower height may be 1.5 times the turbine height from any property line, with no height limit specified for the turbine.

West Hanover Township – Building (UCC)

The West Hanover Township utilizes the UCC, and has made amendments. It is classified as an "opt-in community," and enforces the UCC within its jurisdiction. The same deficiencies are noted in West Hanover Township as with other jurisdictions which adopted the UCC Building Code.

West Hanover Township – Subdivision and Land Development Code

The West Hanover Township adopted its own S&LD ordinance in 1995 (as amended). A review of the S&LD has identified the following related to military compatibility:

1. Subdivision regulations cannot be used to control land use, lot size or density.
2. Subdivision regulations do not offer incentives for desired development near military installations.
3. The subdivision regulations do not require the mapping of noise contours, safety zones or APZs.
4. The subdivision regulations do not require disclosure to buyers of the potential effects of being located near a military facility.

Other References

In the interest of land use compatibility between the military and the local community, the DOD Office of Economic Adjustment (OEA) and other public interest groups, such as the National Association of Counties (NACo), have prepared educational documents and videos that educate and inform the public about encroachment issues and methods that can be used to address existing or future compatibility concerns. The following five resources have been published to inform the public on land use compatibility.

Guides

The Practical Guide to Compatible Civilian Development near Military Installations (July 2007), OEA

This guide offers general information on community development and civilian encroachment issues. The guide can be found at: http://www.oea.gov/.

Joint Land Use Study Program Guidance Manual (November 2006)

This manual provides guidance on the JLUS program, process, and efforts to support compatible development. This manual can be obtained on the OEA website at the following address: http://www.oea.gov/.

Encouraging Compatible Land Use between Local Governments and Military Installations: A Best Practices Guide (April 2007), NACo

This guidebook presents case studies of best practices between the military and communities through communication, regulatory approaches, and Joint Land Use Studies. The guide can be accessed on the NACo website at the following address: http://www.naco.org/.

Videos

The Base Next Door: Community Planning and the Joint Land Use Study Program, OEA

This informative video discusses the issue of encroachment near military installations as urban development occurs within the vicinity. This video can be accessed on the official OEA YouTube channel at: http://www.youtube.com/watch?v=6UiyWDgLeJM

Managing Growth, Communities Respond, OEA

This video highlights the lessons learned from three communities (Kitsap Naval Base in Bangor, Washington; Fort Drum in Jefferson County, New York; and Fort Leonard Wood in Pulaski County, Missouri) that have successful programs for managing growth near their respective military installations. This video can be accessed on the official OEA YouTube channel at: http://www.youtube.com/watch?v=rea6d3bDp3c

Please see the next page.

5. Compatibility Assessment

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Compatibility Factors

Compatibility, in relation to military readiness, is defined as the balance or compromise between community and military needs and interests. The goal of compatibility planning is to promote an environment where both entities communicate, coordinate, and implement mutually supportive actions that allow them to achieve their respective objectives.

Numerous factors influence whether community and military plans, programs, and activities are compatible or in conflict. For the Fort Indiantown Gap (FTIG) Joint Land Use Study (JLUS), 23 compatibility factors were reviewed to confirm the presence of, and establish priorities for, the key study area issues. These compatibility factors are organized into three broad categories: man-made, natural resources, and competition for scarce resources.

Methodology and Evaluation

The JLUS evaluation approach consisted of a comprehensive and inclusive discovery process identifying the key stakeholder issues associated with the common compatibility factors that directly or indirectly affected the recommended strategies in the JLUS Report. During the preparation of the JLUS, the Executive Committee (EC), the Technical Committee (TC), and the public assisted in working through all 23 factors to identify, describe, and prioritize the extent of existing and potential future compatibility issues that could impact lands within or near the study area.

At the initial committee workshops and public meetings, these groups were asked to identify the location and type of compatibility factors they thought existed today or may occur in the future. Other factors and associated issues were added based on their evaluation of available information and Matrix's relevant experience on similar projects.

When reviewing this information, it is important to note the following:

- Technical background on the factors and issues discussed are provided based on available information. The intent is to provide an adequate context for awareness, education, and development of JLUS recommendations. As such, it is not designed or intended to be utilized as an exhaustive technical evaluation of existing or future conditions within the study area.
- Of the compatibility factors reviewed, several factors were determined to not have any associated compatibility issues. These factors, listed below, are included at the end of this chapter for the purpose of future consideration and evaluation.
    - Energy Development
    - Local Housing Availability
    - Air Quality
    - Cultural Resources
    - Legislative Initiatives
    - Water Quality / Quantity
    - Scarce Natural Resources
    - Roadway Capacity

Coordination / Communication

Interagency coordination relates to the level of interaction on compatibility issues among military installations, jurisdictions, land and resource management agencies, and conservation authorities. Interagency communication serves the general welfare by promoting a more comprehensive planning process inclusive of all affected stakeholders. Interagency coordination also seeks to develop and include mutually beneficial policies for both communities and the military in local planning documents and processes.

Compatibility Assessment

COM-1	**Formal Communication Between FTIG and Adjacent Communities.** ■ No formal process exists for communication exchange between FTIG and communities; limited communication presents challenges in the coordination of changes in operations and activities affecting the communities.

During the JLUS data collection and interview process, the committees and several members of the public expressed concern that they were not made aware of changes or activities occurring at FTIG that would impact the community. In addition to development concerns discussed in Issue COM-2, the public desired enhanced notification of mission changes, prescribed burns, events that may increase noise levels, and general changes that could affect the neighboring communities.

Neighboring communities expect FTIG to communicate information about the training activities, schedules, and potential mission changes to nearby residents. Training activities typically involve National Guard personnel, many of whom are employed in other capacities during normal work hours. The training must be scheduled in advance to accommodate the schedules of these individuals and often takes place in the late afternoon or evening hours, on the weekends, or during the summer months. Since training activities are tailored to the need and availability of service members, they may include longer than normal active periods and/or take place on weekends, and may have noise impacts greater than typical training events. Noise that may extend off the installation are produced by operations that include land-based exercises, such as, live-fire and demolition training when using explosives, and air-based exercises, such as, cargo-drop training when using large, fixed-wing aircrafts and tactical maneuvers using rotary-wing aircrafts. The time of day or day of the week when the exercise is conducted can affect the perceived noise level heard outside FTIG. Alerting neighboring communities of training activities, and associated impacts (i.e., increased noise levels and activation of safety fans) will help increase awareness and decrease the level of annoyance. Increased and enhanced communication between FTIG and surrounding communities is especially important in advance of any training activities where noise impacts are noticeable.

Fort Indiantown Gap Training Center has established a formal process to communicate and exchange information with its surrounding communities. An assigned staff officer of the installation attends the regularly scheduled municipality meetings of the following jurisdictions: Lebanon County, East Hanover Township (Dauphin County), East Hanover Township (Lebanon County), and Union Township. Information provided to elected officials and the community includes dates of scheduled artillery/mortar fire, dates of explosives demolition, scheduled prescribed burns of training areas, and significant public events impacting local communities. Fort Indiantown Gap has established a recorded information telephone message at (717) 861-2007 along with print, radio, television and social media outlets to provide current notification of activities and events. An extensive Fort Indiantown Gap website provides information to everyone on news, events, activities, and facilities of the installation. In addition, Fort Indiantown Gap participates in Ex Officio status on the Executive Board of the Lebanon Valley Chamber of Commerce, serving also as the chair of the Military Affairs Committee. Fort Indiantown Gap also serves as a supporting partner with the Northern Lebanon Recreation and Parks Commission.

FTIG is very reliable for issuing press releases regarding upcoming training exercises where increased noise impacts are expected due to the use of larger than typical explosives, extended training hours, or weekend activities; however, they do not always identify one consistent or central FTIG contact for the public's use in obtaining additional information. The majority of responses obtained through public input noted that there is a lack of information related to a single point of contact at FTIG. Members of the public stated that when they have complaints or questions about training schedules and operations they find it challenging to identify and reach the appropriate or central contact at FTIG. Although FTIG does have a Public Affairs Officer, there is no established community information and communication plan for FTIG. Such a plan would likely address major citizen concerns, and could include phone numbers for whom to contact if there is a question about operations, and establish procedures for FTIG personnel interacting with the public.

Increased community awareness through enhanced notification has the potential to reduce the number of community complaints associated with scheduled burns (discussed later in the chapter) and training operations and ultimately enhance the relationship and understanding between FTIG and its neighbors.

COM-2	**Public input into FTIG development.** ■ The process and/or timing for public input into FTIG development is not transparent /not known by the public. ■ Host communities and the public feel they have no input in regard to what is developed on FTIG.

Similar to Issue COM-1, local communities have expressed concern about not receiving adequate notice of proposed military development efforts such as actions ranging from major facility construction to minor maintenance and repair. During the FTIG JLUS process, the committees and several members of the public expressed concern that they were not made aware of development plans occurring on FTIG that could impact the community in advance. Of particular concern was a rappel tower, which stands 50 feet tall and is equipped with a blinking red light for aviation visibility. Another concern was the potential for limiting access on Pennsylvania Route 443 with the addition of a perimeter boundary fence and access control points (gates). Both items were addressed in an Environmental Assessment (EA) presented to the public both through a public meeting and public review period in compliance with the National Environmental Policy Act (NEPA).

This public comment period began on March 16, 2012 and ended on April 16, 2012. A public meeting was held on April 28, 2012 to provide the public with an opportunity to review information in the proposed Draft EA. Both the public comment period and the public meeting were advertised in the Lebanon Daily News beginning March 16, 2012 and copies of the Draft EA were provided to East Hanover Township, Union Township, and the Lebanon County Planning Department for public review. While NEPA requires notification, this should not be the only method of communications and coordination on proposed projects. Community members are typically not fully educated and informed about NEPA, what NEPA is, and how it affects or involves them. As a result, full public involvement will likely not take place as a result of this type of coordination unless the public proactively seeks and understands the opportunities for involvement during the NEPA process.

Identifying and involving all potential affected jurisdictions, agencies and decision makers early in the process helps minimize the potential for incompatibility and public complaint. Taking extra steps to educate the public about NEPA and other platforms for providing public input into FTIG development activities is needed in order to enhance communication among all entities. FTIG's host communities would benefit from FTIG leadership participation in township meetings, including Planning Commission meetings, to more effectively coordinate development review and identify a process for review and response procedures relative to both installation and community development application review.

COM-3	**There is no military representation in local planning agencies.** ■ The local jurisdictions do not currently engage FTIG representatives in their planning processes, development reviews, or to obtain technical information relative to FTIG operations that could be affected by community development near the installation.

Military installations are often unaware of when community development projects are proposed or they are consulted late in the process. This becomes a concern if the project has direct impact on the military mission. More likely, the cumulative effect of uncoordinated community projects may become a compatibility concern for military operations, ultimately resulting in encroachment. Communication between the military and local jurisdictions regarding development review and decision making is a critical step towards military compatibility.

The Tri-County Regional Planning Commission (TCRPC) was formed in 1966 for the purpose of information sharing, consensus building and

coordination to resolve regional issues facing the municipalities of Cumberland, Dauphin and Perry counties. The TCRPC administers four main programs, including: regional planning, transportation, and providing support for the Dauphin County Planning Commission and Perry County Planning Commission. It is the responsibility of the TCRPC to promote the growth and revitalization of communities while continuing the four main programs that integrate transportation, land and environmental use, and economic development Despite FTIG's location in the eastern portion of Dauphin County, neither the county nor TCRPC consult with FTIG when updating their planning processes or through development reviews.

Although the Lebanon County Comprehensive Plan includes a Regional Relationship and Consistency Element, Lebanon County is not part of a larger regional planning organization. Lebanon County and its townships do not confer with FTIG when development applications are being considered in locations proximate to the installation. Regional planning among local municipalities is recommended throughout several elements of the Lebanon County Comprehensive Plan to provide decision-makers with additional and contextual information; however, military representation is not considered.

The lack of military representation on jurisdiction's planning commissions has the potential to create unnecessary incompatibilities associated with proposed development near the installation. Increased military impacts on land uses and land use impacts on military operations causes concern for the military because the training mission environment can become constrained by development, particularly when new missions are being considered.

Land Use

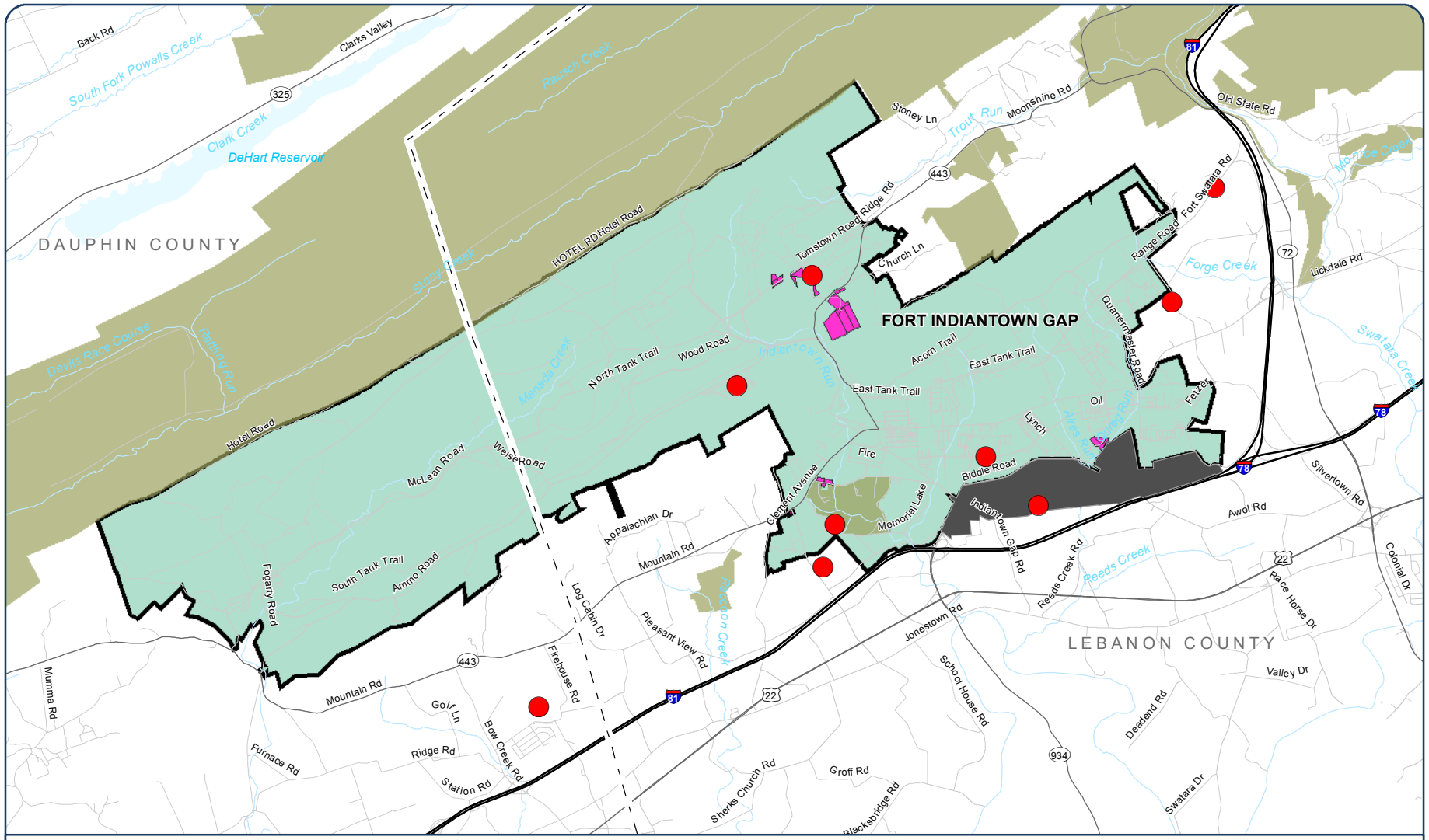
The basis of land use planning relates to the government's role in protecting the public's health, safety, and welfare. County and local jurisdictions' growth policy/comprehensive plans, zoning, and subdivision and land development ordinances can be the most effective tools for avoiding, or resolving, land use compatibility issues. These tools ensure the separation of land uses that differ significantly in character. Land use separation also applies to properties where the use of one property may impact the use of another. For instance, industrial uses are often separated from residential uses to avoid impacts related to noise, odors, lighting, etc.

Compatibility Assessment

As reviewed in Chapter 4 of this JLUS, Lebanon County and Dauphin County each maintain a comprehensive plan. Although a comprehensive plan may guide development with goals, objectives, and policies, it is not a regulatory tool to control land use or prevent incompatible development. Zoning and development standards provide the regulatory mechanism for land use development that can be used to implement the goals of the comprehensive plan. Although Lebanon and Dauphin counties have adopted comprehensive plans, zoning regulations, and subdivision and land development regulations, the lack of land use regulatory controls in local and state jurisdictions (including FTIG) may contribute to incompatible development proximate to the installation.

LU-1	**Confusion stemming from FTIG inholdings.** ■ Several inholdings within FTIG have created confusion over property boundaries and land use control application.

FTIG has a unique land use condition within the installation perimeter as a result of private property inholdings. There are currently 22 inholdings maintained as private property since before the post was established. These properties were never obtained by the federal government when FTIG was a US Army installation and continue to be held in private ownership. Property sizes vary from less than one acre to over 20 acres and are used as either farmland or residential properties. The inholdings are located throughout the installation, including within the training corridor as shown in Figure 5-1. The majority of the inholdings are located off of Pennsylvania (PA) Route 443 north of FTIG's cantonment area and within



Matrix DESIGN GROUP

Sources: PennDOT, 2013; FTIG, 2013; PASDA, 2013.

Figure 5-1: Private Inholdings on FTIG

Figure5-1_PrivateInholdings_20140530_JKC.pdf

the FTIG training areas. Some of the inholdings are located adjacent to PA Route 443 and do not require separate egress through the training areas. Their location within the installation boundaries, particularly within the training corridor, affects FTIG's ability to conduct maneuver and live-fire training.

As discussed in the noise section of this chapter, the Noise Zone II contour associated with small caliber weapons training extends into one of the residential inholdings. Residential land uses are not considered compatible uses within levels of high noise without the provision of additional measures such as the use of sound attenuation in buildings. The presence of in-holders further exacerbates the need for additional safety precautions and increases the potential for public trespassing.

Safety

Safety zones are areas in which development and concentrations of people should be minimized due to the potential higher risks to public safety in these areas. Issues to consider include aircraft accident potential zones, weapons firing range safety zones, and explosive safety zones.

Compatibility Assessment

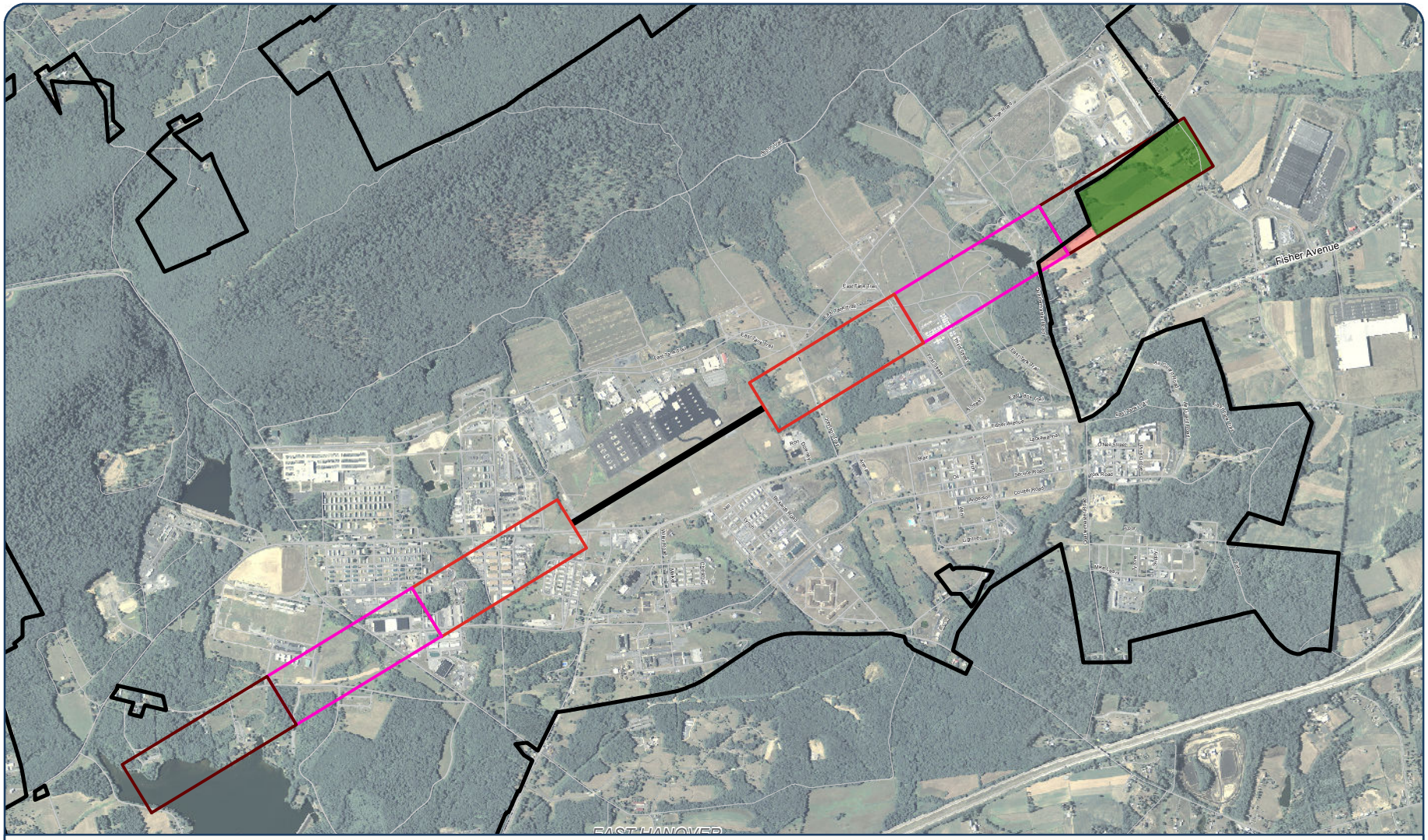
SAF-1	**Future expansion of fixed wing operations would expand safety zones. The use of new and emerging technology could also impact safety buffers.** ■ Potential changes or expansion of fixed wing operations would extend safety zones beyond FTIG boundaries over developed private property.

Development continues to occur near FTIG, particularly to the east. Most recently, single family residential development has occurred off the eastern end of the Muir Army Airfield (MAAF) runway. FTIG's MAAF primarily supports rotary wing aircraft operations and currently has a 4,000-foot runway. A rotary wing aircraft is an aircraft that derives its lift from the rotation of blades on an approximately vertical central axis such as a helicopter. The current runway is inadequate to fully accommodate fixed-wing aircrafts, requiring the aircrafts to operate at below capacity levels in terms of passenger, cargo, and fuel loads. At regular capacity, a C-12 would require a minimum runway length of 5,900 feet. In order to mitigate this issue to allow for long-term usage of fixed wing aircraft, a proposed course of action to extend the runway to 6,000 feet is being considered as a long-term project. The potential runway extension would be constructed on the east end, which would extend the end of the runway closer to FTIG's boundary with private property outside the installation.

The DOD has developed a series of safety zones around runways that provide guidance for the types of development that should not occur within the various zones to minimize risks resulting from aircraft accidents. These zones are based on historic data of where an aircraft accident is most likely to occur. The three safety zones are the Clear Zone (CZ), Accident Potential Zone (APZ) I, and APZ II. Each of the safety zones has recommended guidelines for the type of development that should not occur within them. These guidelines can be found in the DOD United Facilities Criteria (UFC) 3-260-01, under *Land Use Compatibility Guidelines for Clear Zone and Accident Potential* Zones. The parameters for the safety zones of the runway at MAAF are described in Chapter 3 of this report and include the CZ, Accident Potential Zone I (APZ I) and Accident Potential Zone II (APZ II).

If the MAAF runway were to be extended to 6,000 feet, which is being considered as a potential long-term project, all of the eastern CZ would be contained within the boundary of FTIG; however, roughly half of the APZ I and almost the entire APZ II would extend past the boundary onto private land within Union Township as shown in Figure 5-2. The majority of the land that would be under APZ I and II is currently zoned as agriculture. There is a small amount of land that would be in APZ I that is zoned for commercial development, and a small portion of land that would be within APZ II that is zoned for industrial development.

There are some land uses allowed within these different zones that are incompatible with the recommended land uses within APZ I and II. Within the agricultural zoning category, single family dwellings, churches, commercial day care, and country clubs are allowed. Land uses that include



Legend

Safety Zone (Existing Runway)
- Clear Zone
- APZ I
- APZ II

Zoning
- Agriculture
- Commercial

- Fort Indiantown Gap
- Runway
- Local Road

0 0.25 0.5 Miles

Matrix DESIGN GROUP

Sources: PennDOT, 2013; FTIG, 2013; PASDA, 2013.

Figure 5-2: Current and Proposed MAAF Safety Zones

Figure5-2_Current_Proposed_SafetyZones_20140530_JKC.pdf

concentrations of people or habitable structures are not recommended within APZ I. Within APZ II, country clubs and low density residential are allowable uses, with a suggested maximum density of 1-2 dwelling units per acre, which could be possibly increased under a Planned Unit Development (PUD) where the maximum lot coverage is less than 20 percent. Within the Commercial district, the majority of the uses allowable in this zone are incompatible with APZ I and should not be developed on the lands that would be located under APZ I. Due to the current level of development in the area, incompatible commercial development is not likely to occur on the small piece of vacant commercially zoned land.

The majority of the uses allowed within the Industrial zone are compatible with APZ II; however, some are only compatible if they adhere to certain restrictions and may be compatible only on a case-by-case basis. There are some uses allowed within the Industrial zone that are incompatible, including any uses that provide for gathering of people, such as hotels, trade schools, offices, restaurants, and certain types of commercial facilities.

SAF-2	**New and emerging technologies could require modifications to Range safety zones.** ■ New and emerging technologies in weapons, ammunition, and target engagement scenarios could extend the safety buffer areas of Range Surface Danger Zones.

Field training at FTIG takes place within the Training Corridor – a 12,000-acre area located north of the cantonment area and bounded by Second Mountain to the north and Blue Mountain to the south. Within this area, different types of field training are conducted including the live firing of weapons with stationary and maneuvering targets at range facilities dedicated to specific weapons, ammunition, and target engagement scenarios.

The Department of the Army (DA) has issued range safety guidance through Pamphlet (PAM) 385-63, which provides standards and procedures for the safe firing of munitions and demolition for training and target practice. Included within this guidance are requirements for Safety Danger Zones (SDZs) to minimize the inherent risk of ammunition from landing in areas that could cause harm to life or property.

The SDZs for a specific range include safety buffer areas to reduce the risk potential for stray ammunition from impacting operations at other range areas or landing outside the installation fence line and compromising the safety of the surrounding community. For this purpose, DA PAM 385-63 specifies that no part of an SDZ may leave the installation property. FTIG is compliant with the SDZ requirements per the Army guidance – all SDZs are currently contained within the installation.

The Department of the Army employs an active science and technology program to provide better battlefield performance of platforms, weapons, and people. High combat readiness requires modern equipment and realistic training to meet strategic and sustained capability into the future. Changes to the types of weapons, ammunition, and target engagement scenarios will require review of current SDZs and consideration of expanded safety buffers to ensure that safety risks continue to be minimized outside the fence line.

Vertical Obstructions

Vertical obstructions comprise buildings, trees, structures, equipment, or other features of varying heights that encroach into the navigable airspace used for military operations. Generally, the height and distance of the object from the nearest airfield or heliport are the two biggest factors that cause an object to be considered a vertical obstruction. As is the case with FTIG, mountainous terrain can also be a contributing factor. These objects, when located at a certain height or in a specific location, can present a safety hazard to both the public and military personnel and potentially impact military readiness.

Typically, the objects of greatest concern are those closest to an airfield or heliport. However, objects reaching heights of 1,000 feet or more can compromise low-level flight operations by limiting the areas where such operations can occur. These objects may include a range of obstructive items from man-made (such as telephone poles and power lines) to natural (such as tall trees and other land features).

Compatibility Assessment

VO-1	**Existing and future vertical obstructions impact FTIG operations.** ■ Existing transmission lines and communication towers impact FTIG aviation approach and departure clearance surfaces and have necessitated workarounds. ■ The location of additional communication and transmission towers on mountainous terrain limits the potential for future mission changes at FTIG.

Rotary-Wing Aircraft Operations

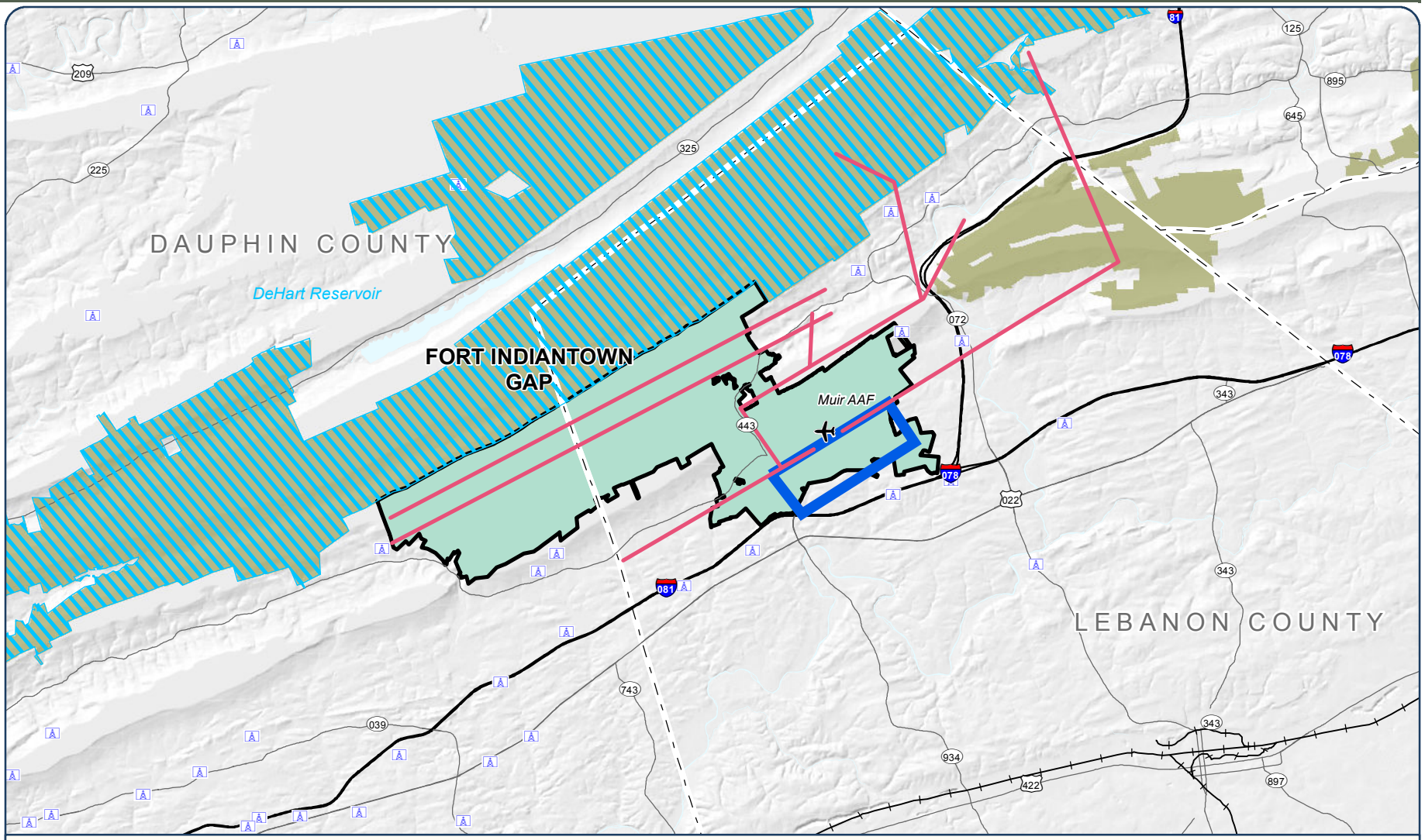
The flight training area for rotary-wing aircraft operations includes closed-loop patterns involving MAAF, training areas, and landing zones within the Northern Training Area (NTA), and flight corridors extending east and north from FTIG into the NTA. The closed-loop patterns involving MAAF are generally contained within the FTIG boundaries with the exception of a small portion that extends to I-81 and East Hanover Township in Lebanon County. The “closed-loop” flight pattern does not refer to a specific military operation, but the flight track utilized by the rotary wing aircraft to encompass all of the training facilities at FTIG and minimize off-base impacts.

State Game Lands 210, 211, and 264 each represent one training area and collectively include 25 landing zones, the majority of which are located in SGL 211. The entry flight corridor connecting FTIG to the NTA aligns with Pennsylvania Route 443 through the FTIG area, then diverts north near I-81, and continues north through Swatara State Park into a large area that includes the Blue Mountain ridgeline. The exit flight corridor connecting NTA to FTIG departs the Blue Mountain area to the south just east of the Lebanon Reservoir, continues south to an area around Lake Weiss and Lake Strause, and diverts to the west on a course to FTIG immediately south of the Monroe Valley Golf Club.

Flight levels associated with closed-loop training activities at MAAF stay in the range of 900 to 1,200 feet AGL. Within the NTA, the airspace extends from surface to a ceiling of 2,000 feet AGL; however, the majority of flight operations are contained within an area extending from 500 feet AGL to 2,000 feet mean sea level (MSL). The exception to the 500-foot operational minimum is flight over private properties; in these instances, the minimum flight level is 1,000 feet AGL. To reach the NTA, the flight corridors are utilized at a level ranging between 600 and 800 feet AGL.

As shown on Figure 5-3, there are a number of vertical obstructions located within or proximate to these training areas. While none of these structures are greater than 500 feet AGL, all are above the elevation of MAAF. Consequently, the Federal Aviation Administration (FAA) required an obstruction evaluation for all of these structures, but determined that none present a substantial adverse effect to air navigation. The determination is predicated on the use of instrument flight procedures and based on the safe and efficient use of navigable airspace. The rotary-wing operations are conducted utilizing visual flight rules and not instrument flight rules /instrument procedures. This means that pilots fly in conditions where they can visually observe their surroundings using geographical references for orientation and navigation.

The rotary-wing training operations at FTIG take place during daytime and nighttime hours. Night aviation operations may include the use of night vision goggles to aid sight. Regardless of sight aids, all flights conducted in support of training operations always chart a flight route, which is reviewed and approved prior to takeoff, and maintain a current hazards map. This map includes hazardous features, such as, communication towers and their associated heights AGL. To further ensure maximum safety during



Legend

- CellTowers
- Flight Tracks
- Traffic Pattern
- State Gameland
- Northern Training Area
- Fort Indiantown Gap
- County Boundary
- Interstate Highway
- State Highway
- US Highway
- Airports
- Railroad
- Water Body

0 1.5 3 Miles

Matrix DESIGN GROUP

Sources: PennDOT, 2013; FTIG, 2013; PASDA, 2013.

Figure5-3_VertObs_Rotary_20140530_JKC.pdf

Figure 5-3: Vertical Obstruction: Rotary Wing Operations

nighttime training operations and since vertical obstructions may be hard to identify even with night vision goggles, minimum flight altitude levels are determined based on the highest object within the flight path.

Since flight routes and training activities are based on the available land area and are charted to avoid noise-sensitive areas, vertical obstructions can present additional limitations to flight training opportunities at low-level altitudes. Additionally, training activities are intentionally buffered to provide the safest possible operational outcomes; buffering includes the use of minimum flight altitude levels. The limitations imposed by vertical obstructions and the implementation of additional safety measures minimize the opportunity for realistic training scenarios.

Fixed-Wing Aircraft Operations

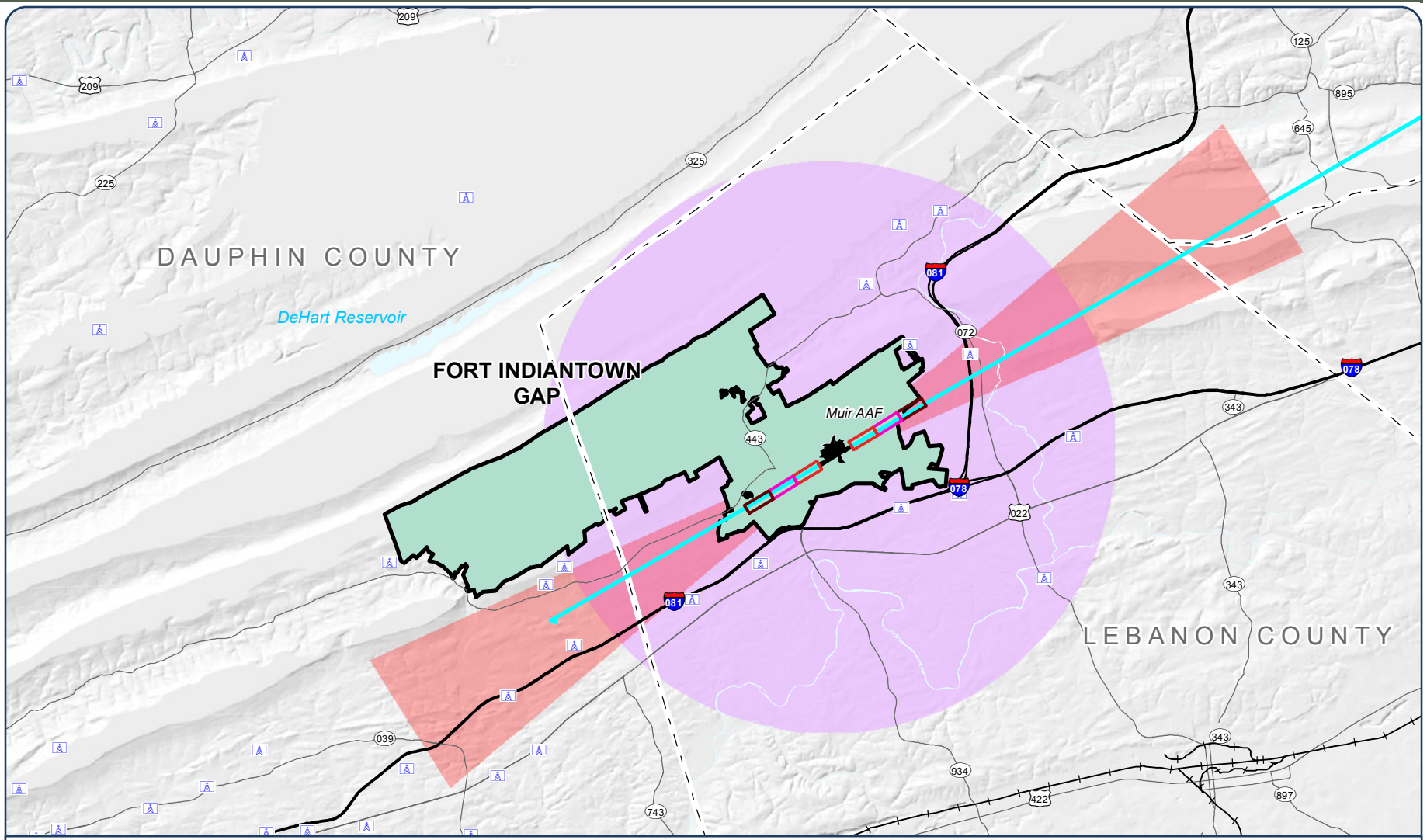
The fixed-wing aircraft operations at MAAF are not as substantial as the rotary-wing aircraft operations but are a part of the existing FTIG mission. Fixed wing operations are limited due to the length of the existing runway. The current runway measures approximately 4,000 feet in length while a longer runway is required for long-term continued use of fixed-wing aircraft. Current flight operations for fixed-wing aircraft at MAAF are limited to personnel transport and movement of small cargo and are required to operate at less than full fuel capacities. All of these measures are designed to limit weight loads on the aircraft since the runway length is insufficient to allow a fully-weighted takeoff or landing.

Each aircraft at MAAF averages approximately two to three flights per day. Fixed-wing operations are conducted as thru-operations involving take-offs and landings. Closed-loop fixed-wing training is not authorized at MAAF. The Pennsylvania Army National Guard (PAARNG) Statewide Operational Noise Management Plan (ONMP) noted specific approach and departure flight parameters for these fixed-wing aircraft. These include an 114,000-foot approach length to the start of the runway and a 33,000-foot departure length from the end of the runway. The approach length is based on descent from a flight level of approximately 6,000 feet AGL; the departure length is based on ascent to a flight level of approximately 5,000 feet AGL. These approaches and departures can take place from either an easterly or westerly direction depending on weather conditions.

Within a radius of five nautical miles from MAAF, 16 vertical obstructions are noted, as shown on Figure 5-4. The FAA reviewed all of these vertical obstructions and determined that none present a substantial adverse effect to air navigation. The determination is predicated on the use of instrument flight procedures and based on the “safe and efficient use of navigable airspace by aircraft”.

Fixed-wing aircraft at MAAF utilize instrument flight procedures; however, the approach and landing associated with MAAF is accomplished using a non-precision instrumented approach. A non-precision instrumented approach only provides lateral guidance for approaching and landing on a particular route to a runway; it does not provide vertical data. Many of the 16 noted vertical obstructions are located north or south of the flight approach and departure corridors and do not present a concern to the FTIG mission. However, six of the vertical obstructions are close to the MAAF flight paths and can present a concern in relation to the approach. Altitude, among other considerations like speed, is of critical importance during the approach sequence for a non-precision instrumented approach. The obstructions do not necessarily present a flight hazard, but do require the aviators to be that much more aware of their flight elevation and their surroundings.

With regard to departure sequences from MAAF, the same vertical obstructions noted on approach present the same concern due to the fact that the obstructions are within or proximate to the initial climb area required for the aircraft to obtain flying level altitude. The initial climb area length extends from the departure end of the runway to up to five nautical miles in a straight line from the end of the runway. In conjunction with the length of the climb area, a transitional area also begins at the end of the runway extending outward in a 15-degree fan on either side of the runway forming a pie-shaped wedge. The tower operated by the Lebanon County Emergency Management Agency is proximate to the initial climb area when departing from MAAF to the west.



Legend

- CellTowers
- Approach & Departure Length
- **Safety Zone (Existing Runway)**
  - Clear Zone
  - APZ I
  - APZ II
- Regulated Airspace
- Approach-Departure Clearance Surface
- Fort Indiantown Gap
- County Boundary
- Interstate Highway
- State Highway
- US Highway
- Airports
- Railroad
- Water Body

0 1.5 3 Miles

Matrix DESIGN GROUP

Sources: PennDOT, 2013; FTIG, 2013; PASDA, 2013.

Figure5-4_VertObs_Fixed_20140530_JKC.pdf

Figure 5-4: Vertical Obstruction: Fixed Wing Operations

VO-2	**Vertical improvements adjacent to FTIG are incompatible with future FTIG mission.** ■ Union Township height regulation within zoning ordinance contains exceptions: height limitations do not apply to spires; microwave, television, transmission, or radio towers; silos; antennas; or water tanks. ■ Locating additional communication and transmission towers on mountainous terrain limits the potential for future mission changes at FTIG.

As previously noted, a longer runway is required for long-term continued use of fixed-wing aircraft at MAAF. To comply with UFC regulations for airfields with fixed-wing operations, a minimum runway length of 6,000 feet has been identified by FTIG to accommodate full operational capacity. Preliminary plans for this runway extension indicate that the extension would require approximately 2,300 feet of additional runway length on the northeast end of the existing runway.

Based on the existing runway approach length of approximately 114,000 feet from the start of the runway, the approach length is estimated to extend further into Lebanon County and possibly into Berks County. This potential extension will result in a shift of the existing clear zones, accident potential zones, and transitional surfaces further to the east.

Considering the potential moderate growth that could occur to FTIG's fixed-wing mission and their existing rotary-wing mission associated training areas, height regulations for local municipalities are of paramount importance to continued mission opportunity and growth. The following information addresses the existing height regulations and restrictions contained within each of the potentially affected municipalities' ordinances with regard to impact on both fixed- and rotary-wing aircraft operations. *Note*: West Hanover and Annville Townships are not affected by either fixed or rotary-wing aircraft operations and are not included in the discussion below.

Cold Spring Township, where the majority of rotary-wing operations occur, does not have any ordinances regulating height. Cold Spring Township does not have a local government organization and relies on the Lebanon County Planning Department for the coordination of planning issues.

The area contained within Union Township is subject to both the fixed-wing approach for MAAF and rotary-wing training operations. The ordinances concerning height regulate telecommunication and wireless communication facilities, but do not regulate spires, clock towers, microwave towers, cupolas, silos, antennae, flagpoles, water tanks, ventilators, chimneys, television transmission or radio towers, elevators or stair bulkheads or other similar appurtenances usually placed above the roof level and not intended for human occupancy. With regard to the regulations concerning telecommunication and wireless communication facilities, Union Township requires structures to have a setback from the property line that is equal to the height of the building, plus a 50-foot setback to allow for wire anchors. ". Other requirements that the township has placed on such structures include: placement of the structure a minimum of 500 feet from Residential and Village zoning districts, approval from the FAA and the Federal Communications Commission (FCC); and proof that colocation on an existing structure is insufficient for the telecommunication or wireless communication need.

East Hanover Township, where the departure of fixed-wing operations from MAAF occur, has several ordinances in place restricting height of various structures. These restrictions include:

- 150-foot maximum height for uninhabitable accessory farm structures.
- 75-foot maximum height for chimneys, flagpoles, water tanks, and all other building parts and /or attachments.
- No maximum height for wind energy conversion systems except that they "shall not be greater than the shortest distance measured along a horizontal plane from the unit to any lot line".

- No maximum height for water towers, antennae, utility poles, smokestacks, chimneys, farm silos, windmills, flagpoles, or other similar structures except that the setback from the property line, must be at a horizontal distance equal to the height.
- 199-foot maximum height for antenna towers.

The lack of consistency between the municipalities' ordinances concerning height could create a situation where companies and individuals desiring to site a communications tower would choose a site with fewer regulatory requirements. Since the majority of fixed- and rotary-wing operations occur in the municipalities where minimal or no regulatory requirements exist, there could be a concern for future flight operations. Siting additional future towers in or near FTIG training areas could create congestion depending on the tower locations. The cumulative effect of siting many towers near to each other will limit the low-altitude and night training exercises that FTIG currently conducts, would likely constrain the ability to configure different training scenarios at the NTA for future training activities, and could impact the future ability of FTIG to absorb additional flight training activities.

Infrastructure Extensions

This factor covers the extension or provision of infrastructure (roads, sewer, water, etc.). Infrastructure plays an important role in land use compatibility. On the positive side, infrastructure can enhance the operations of an installation and community by providing needed services, such as sanitary sewer treatment capacity and transportation systems. Conversely, infrastructure can become an encroachment issue if enhanced or expanded without consideration for how future development may occur. The extension or expansion of community infrastructure to a military installation or areas proximate to an installation have the potential to induce growth, potentially leading to incompatible uses and conflicts between military mission and civilian communities. Through careful planning, the extension of infrastructure can serve as a mechanism to guide development into appropriate areas, protect sensitive land uses, and improve compatibility of land uses and military mission.

Compatibility Assessment

IE-1	**Infrastructure expansion near FTIG.** ■ Limited sewer expansion options exist outside of FTIG's influence areas. Poor siting for expansion could result in incompatible development.

There are several communities around FTIG currently experiencing growth but are limited to the amount of future development that can occur because of insufficient infrastructure, including sewer and water. Some of these areas have been identified as infrastructure growth areas and are expected to see increased development in the future, particularly for housing.

East Hanover Township in Dauphin County has experienced growth pressure due to its proximity to Harrisburg. The opening of the Hollywood Casino and Penn National Racetrack in 2008 is expected to catalyze growth in the township. However, the current level of infrastructure in the region, particularly sewer and water, is not adequate to support significant increased development. There is some sewer availability in East Hanover Township, but as a whole, the township currently lacks a public sewer and water system. Both the Dauphin County and East Hanover Township Comprehensive Plans recommend that any new development in the township occur along existing infrastructure lines or areas that do not require extension of new infrastructure.

The current economic situation is not likely to stimulate new sewer infrastructure development in Dauphin County's East Hanover Township in the near future; however, once the economy begins to recuperate, this area is anticipated to see new growth which will require new infrastructure. If new infrastructure is developed in the future, it should take into account areas where certain types of development may impact or be impacted by operations at FTIG, so that new infrastructure lines do not promote incompatible development.

To the east of FTIG, Lickdale in Lebanon County has access to public sewer and may be able to sustain growth in the near term as a result. This area has large commercial and industrial growth potential, and is currently in the process of developing a new industrial complex near the FTIG boundary.

Anti-Terrorism / Force Protection

Anti-Terrorism/Force Protection (AT/FP) relates to the safety of personnel, facilities, and information on an installation from external threats. Methods to protect the installation and its supportive facilities can impact off-installation uses.

Compatibility Assessment

AT-1	**Unsecured perimeter.** ■ FTIG does not have controlled access, which allows the public to approach several range areas. ■ PA Route 443, a public roadway, transects FTIG through the cantonment and training areas.

Security concerns and trespassing can present immediate compatibility concerns for installations. Due to current world conditions and recent events, military installations are required to meet more restrictive standards to address AT/FP issues. These standards include increased security checks at installation gates and physical changes (such as new gate/entry designs). Additional emphasis on credential and vehicle checks can create capacity and queuing issues with entrance gates that are inadequate to support the high volume of vehicles requiring access to the installation on a daily basis. The reduced processing throughput time at the gates can create circulation issues and general safety concerns external to the installation and within local communities.

FTIG is an open installation, with minimal access control points onto the post. Installation security is vital to the conduct of efficient and safe operations and training. Open access to the installation has resulted in a variety of encroachment issues, including “illegal entry and trespass as well as theft of materials and natural resources”. The lack of perimeter security has resulted in periodic interruption of training due to intruders in training and impact areas. Security concerns associated with public trespass are not only a safety hazard but also present security concerns when the public is able to get close enough to view and observe secure training operations.

In addition to training, FTIG hosts a variety of activities that allow community access. FTIG also hosts events that involve large gatherings of troops, families, or high-ranking state and federal officials. During these types of events, there is a heightened level of security due to the larger number of people on the installation; however, adequate security screening cannot be conducted due to the lack of a secure perimeter or secured access points in range areas.

Most streets on the installation are open to both personal and government vehicles. For safety reasons, travel outside of the cantonment area and into the training areas requires a vehicle operation permit issued by Range Operations. Northern training areas are accessible via Cold Springs Road, while western areas are accessible via Ammo Road and McLean Road, which intersect SR 443. Hunting, fishing, and collecting firewood is permitted within training areas, in accordance with FTIG Regulation 215-2 Outdoor Recreation in the Training Areas.

Although permits are required to access certain areas and to conduct recreational activities, security enforcement is constrained by a lack of personnel to provide constant surveillance. Portions of the installation are subject to temporary public closure and troops not involved in weapons firing when live-fire exercises are being conducted. Safety fans (access restrictions for each type of weapon fired on any range) have been designated to create buffer zones, often encompassing several thousand acres.

They are designated to protect personnel from any rounds and ricochets escaping the boundaries of the range (FTIG Range Regulation 350-2). Public recreational activities on the installation are not allowed within the safety fan limits when those safety fans are in effect. Barricades on Range Road, Acorn Road, Ammo Road, and other strategic roads further limit access to

these areas. While these barricades prevent vehicles from accessing certain active ranges, pedestrians are often unaware of the activities in progress and have been reported to side step barricades.

An EA was completed by FTIG in 2013 to address the implementation of FTIG's 2009 RPDP. The RPDP serves as the installation's Master Plan and identifies long range improvements for the installation, including increased security measures to meet the expanding mission requirements in serving the PAARNG and other personnel. One of the RPDP's primary goals is to implement a controlled perimeter that would be used during times of heightened security. The controlled perimeter being considered would consist of access control points (ACPs), security fencing, and vehicular gates; however, it would not enclose the entire installation perimeter.

The purpose of the controlled perimeter is to restrict the public from accessing the base during times of heightened security, allowing FTIG to operate at all Force Protection Condition (FPCON) levels. The proposed controlled perimeter would include, at a minimum, ACPs, but could also include a combination of fence, guide rails, and terrain features. One alternative being considered is the implementation of two ACPs (ACP East and ACP West) and the closure of Clement Avenue between Asher Miner Road and Fisher Avenue. The ACP West would be located at the intersection of Fisher Avenue and Biddle Road. The ACP East would be located at the intersection of Fisher Avenue and Quartermaster Road shown in Figure 5-5. This ACP would have a welcome center with parking, truck inspection lanes, and vehicle inspection lanes functioning in the same capacity as those located at ACP West.

Noise

Sound is the mechanical energy transmitted by pressure waves in a compressible medium such as air. Sound is what we hear which when reaches unwanted levels is referred to as noise.

The central issue of noise is the impact, or perceived impact, on people, animals (wild and domestic), and general land use compatibility. Exposure to high noise levels can have a significant impact on human activity, health, and safety.

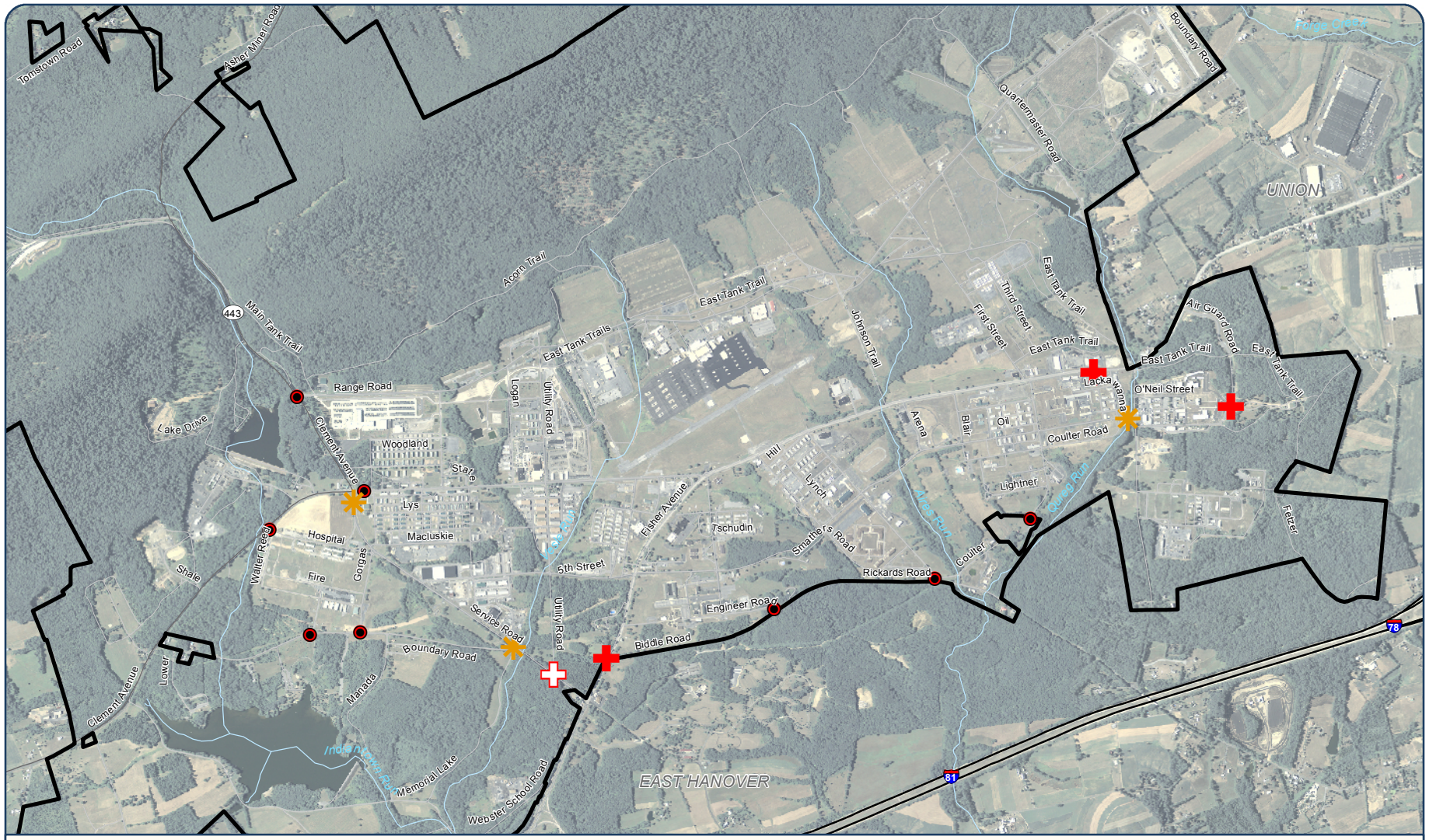
Technical Background

Due to the technical nature of this resource topic and its importance to the JLUS process, this section provides a discussion of the characteristics of sound and the modeling process used to evaluate noise impacts. The following key terms are used to describe noise:

Ambient Noise. The total noise associated with an existing environment, which usually comprises sounds from many sources, both near and far.

Attenuation. Reduction in the level of sound resulting from absorption by the surrounding topography, the atmosphere, distance from the source, barriers, construction techniques and materials, and other factors.

A-Weighted Decibel (dBA). The dBA is the most commonly weighted sound filter used to measure perceived loudness versus actual sound intensity because the human ear responds differently to frequencies. For example, the human hearing system perceives mid-frequency sounds as louder than low and high frequency sounds. To accommodate this condition when measuring sound levels, filters need to be installed into sound meters. The results are a more accurate measurement of sound for the human hearing system.



Legend

- Future Closed Access Point
- Limited Use Gate
- Secondary Access Control
- Primary Access Control
- Fort Indiantown Gap
- Interstate Highway
- Major Road / Streets
- Local Road
- River / Stream

0 0.25 0.5 Miles

Matrix DESIGN GROUP

Sources: PennDOT, 2013; FTIG, 2013; PASDA, 2013.

Figure 5-5: Proposed AT/FP Access Control Points (ACP)

Figure5-5_AFFP_ACPs_20150316_CJM.pdf

Day-Night Average Sound Level (DNL). DNL represents an average sound exposure over a 24-hour period. During the nighttime period (10:00 p.m. to 7:00 a.m.), averages are artificially increased by 10 dB. This weighting reflects the added intrusiveness and the greater disturbance potential of nighttime noise events attributable to the fact that community background noise typically decreases by 10 dB at night.

Noise Contours. Connecting points of equal noise exposure. Typically expressed in five dBA increments (i.e., 60, 65, 70, 75, etc.).

Sensitive Receptors. Sensitive receptors are defined as locations and uses typically more sensitive to noise, including residential areas, hospitals, convalescent homes and facilities, schools, and other similar land uses.

Characteristics of Sound

It is important to understand that there is no single perfect way of measuring sound, due to variations used by different entities when conducting sound studies or sound modeling. Sound is characterized by various parameters that include the rate of oscillation of sound waves (frequency), the speed of propagation, and the pressure level or energy content (amplitude). The sound pressure level has become the most common descriptor used to characterize the loudness of an ambient sound level. The dB scale is used to quantify sound intensity. Because sound pressure can vary by over one trillion times within the range of human hearing, a logarithmic loudness scale (i.e., dB scale) is used to present sound intensity levels in a convenient format.

Since the human ear is not equally sensitive to all frequencies within the entire spectrum, noise measurements are weighted more heavily within those frequencies of maximum human sensitivity in a process called "A-weighting" written as dBA. In this document, all sound or noise levels are measured in dBAs, which are units of sound pressure adjusted to the range of human hearing with intensity greater than the ambient or background sound pressure. The threshold of human hearing is approximately 0 dBA and normal speech has a sound level of approximately 60 dBA. Sound levels above 120 dBA are typically when discomfort begins to be felt inside the human ear, and sound levels between 130 to 140 dBA and above are felt as pain and may cause permanent damage to the ear.

The human ear can detect changes in sound levels of approximately 3 dBA under normal conditions. Changes of 1 to 3 dBA are typically noticeable under controlled conditions, while changes of less than 1 dBA are only discernible under controlled, extremely quiet conditions. A change of 5 dBA is typically noticeable to the general public in an outdoor environment. Figure 5-6 summarizes typical A-weighted sound levels for a range of indoor and outdoor activities.

Environmental noise fluctuates over time. While some noise fluctuations are minor, others can be substantial. These fluctuations include regular and random patterns, how fast the noise fluctuates, and the amount of variation. Weather patterns can have a strong effect on how far sound travels and how loud it is. Certain weather events can change the consistency of the air and either cause sound to travel further and be louder or can reduce the distance at which it can be heard. Temperature and wind velocity are prime examples of factors that can affect sound travel. Sound tends to travel further in cold temperatures. Specific combinations of temperature and wind direction can create atmospheric refraction, which is when atmospheric conditions bend and/or focus sound waves towards some areas and away from others. When describing noise impacts, it is common to look at the average noise over an average day.

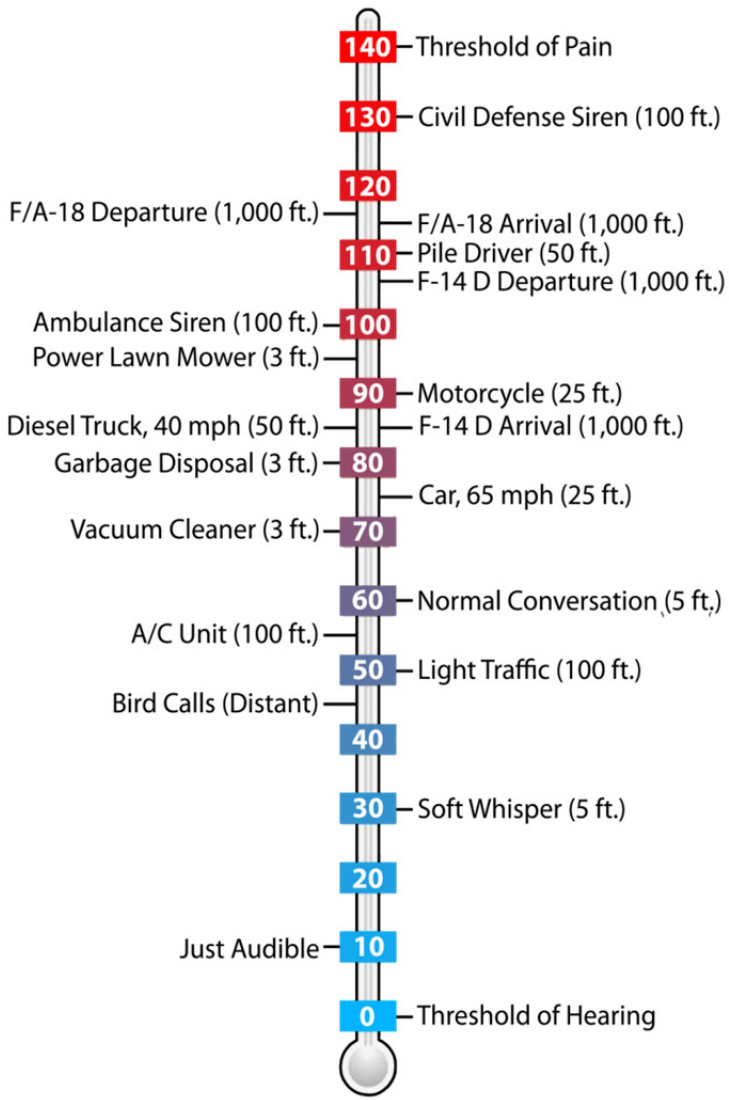


Figure 5-6 Sound Levels Comparison in dB

According to the DOD and the FAA, [Airport Noise Compatibility Planning (14 CFR Part 150)] 65 DNL is defined as the threshold for significant noise exposure. Noise exposure within the 55 to 65 DNL noise contours is regarded as moderate and land use controls such as the regulation of types of land uses permitted or the potential use of sound attenuation in buildings should be considered. Federal guidelines have been adopted to guide appropriate development and land use planning for noise contours greater than 65 DNL, and noise sensitive uses such as residential and schools should not be built under these areas without proper sound mitigation. It should be noted that the DNL contours represent an average sound level over a 24-hour period and that individual instances may be louder than the noise contour in which they are located. In addition, noise may still cause an annoyance if it is below 65 DNL.

Compatibility Assessment

NOI-1	**Noise associated with range firing activity.** ■ Noise from artillery and demonstration/small arms training is heard outside FTIG and negatively affects existing residents and livestock.

FTIG conducts weapons firing training that utilizes both large caliber munitions and small caliber ammunition and conducts demolition exercises with large caliber explosives. The activity associated with small caliber weapons firing training is concentrated in the firing ranges located along an area north of and adjacent to the FTIG cantonment area. Small caliber weapons training also occurs in the range areas and urban operations facilities located between Blue Mountain and Second Mountain. Exercises involving large caliber ammunition or large amounts of explosives for demolition exercises primarily occur in the FTIG range area with most occurring close to the middle of the range area.

Small Caliber Exercises

The U.S. Army Public Health Command (USAPHC) conducted noise modeling for the PAARNG and presented the information in the 2012 Statewide ONMP. The modeling for weapons firing training utilizing

small caliber ammunition was conducted using the PK15(met) standard. This standard is typically used to model activities using small caliber for several reasons:

- It takes into account only the loudest level recorded during the noise event (the peak or PK in PK15(met));
- It produces noise contours that are only exceeded 15 percent of the time (the 15 in PK15(met)); and
- It statistically maximizes the decibel (dB) inputs to account for conditions, like weather, that can cause sound to travel farther/enhance sound propagation [(meteorology or met in PK15(met)].

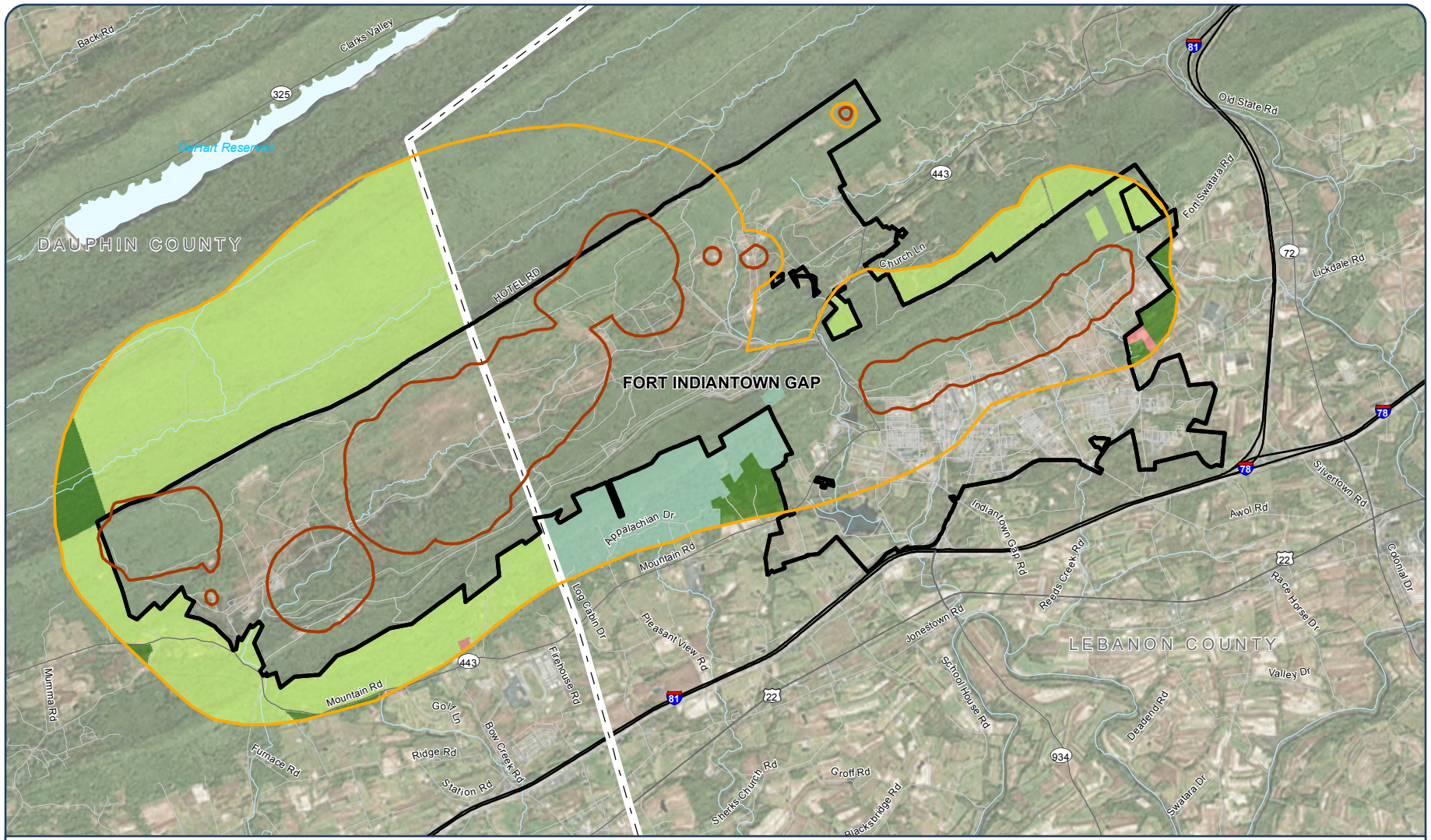
The PK15(met) model produces noise contours that are accurate 85 percent of the time. This means that for every 100 noise events, noise will exceed the limits of the noise contours, as predicted by the model, by as little as 15 times. The primary basis for the use of the model is that it provides a linkage to estimated noise complaint frequency. Noise associated with operations utilizing small caliber ammunition is typically frequent and of longer duration than that of operations with large caliber munitions. Various studies have shown that continued exposure to repetitive sound or noise, like small arms firing, decreases the threshold for annoyance. Since the overall threshold for annoyance is decreased through repetitive exposure, the minimum noise contour produced by the PK15(met) is 87 dB. All land uses outside of this noise contour are expected to be compatible with the noise-producing operations as the noise from the operations is expected to result in fewer noise complaints. This area is known as Noise Zone I and includes all areas outside of Noise Zones II and III, but is typically not depicted on noise contour graphics.

The Noise Zone II contour extends from inside the 87 dB contour to 104 dB between Noise Zone I and III. Noise sensitive land uses are generally considered incompatible within this area since there is a moderate risk for complaints. Noise Zone III is the area where noise is the greatest – extending from 104 dB to the noise source. Noise sensitive land uses are considered incompatible within this area since there is the greatest risk of complaints.

With regard to the FTIG small caliber weapons training, all areas within the Noise Zone III are confined to the boundaries of FTIG with the exception of a small area extending off of the northwest corner of FTIG and another small area that extends off of the northern boundary of FTIG as shown in Figure 5-7. The northern incursion extends into a forested area within State Game Lands 211. The other incursion extends into private property located in West Hanover in Dauphin County zoned for conservation.

The Noise Zone II contour was identified as a result of the small caliber weapons training extending into one of the residential inholdings on FTIG and into adjacent privately-owned properties primarily on the west, south, and east sides off FTIG. With regard to the contour extending off FTIG to the north, the USAPHC noted that the location of Second Mountain on the north side of FTIG likely minimizes the sound propagation shown by the model. They expected that the contour would actually be minimized due to the buffering that the mountain side offers and noted that the PK15(met) model cannot account for geologic formations. On the west and southwest side of FTIG in East and West Hanover Townships (Dauphin County), the contour overlaps areas that are zoned for conservation/forest, agriculture/ low density residential, and commercial recreation. According to the West Hanover zoning ordinance, agricultural zones require a minimum lot size of two ac/du and conservation/open space zones require a minimum of five ac/du. East Hanover Township requires a minimum lot size of 10 acres per dwelling unit (ac/du) in agricultural zones and 1 ac/du in conservation zones.

The commercial recreation zoning is associated with the Penn National Race Course. There is also a sliver of small scale commercial adjacent to and west of the Penn National site, presumably to allow for amenities supporting the nearby racing and gaming attractions. On the south side of FTIG and west of the cantonment area, the land is zoned for agricultural uses and rural resource area.



Legend

- Noise Zone 2 (62 - 70 CDNL)
- Noise Zone 3 (> 70 CDNL)

Zoning

- Agricultural
- General Commercial
- Conservation / Open Space
- Light Industrial
- Forest Residential
- Residential
- Fort Indiantown Gap
- County Boundary
- Interstate Highway
- Major Road / Streets
- Local Road
- Water Body
- River / Stream

0 0.75 1.5 Miles

Matrix DESIGN GROUP

Sources: PennDOT, 2013; FTIG, 2013; PASDA, 2013.

Figure 5-7: Small Caliber Noise Contours

Figure5-7_SmallCal_Noise_20150316_CJM.pdf

On the east side of FTIG and to the east of the cantonment area and the small arms ranges, the land is zoned for agriculture and a rural resource area. Areas outside of, but directly adjacent to the Noise Zone II contour still experience the noise associated with the small caliber weapons training activities. However, the noise is less than 87 dB for 85 percent of all training activities and the noise gradually diminishes based on distance away from the contour edge.

Demolition and Large Caliber Exercises

The model used to produce the noise contours associated with the explosives demolition and exercises using large caliber was the Blast Noise Impact Assessment program. A sound profile and a corresponding noise contour is developed by the program through the input of the types of weapons fired and/ or detonations, the amount and type of ammunition used, the target locations, and the propellant amount used to get the fired round to the target. The sound profile associated with demolitions/explosions and firing exercises with large caliber rounds uses a C-weighted day-night level (CDNL). The C-weighting of decibels is used for intense signals containing low frequency sound energy like those that emanate from large gun blasts, sonic booms, and detonations. The DNL is an average of all inputs over the course of a year, but includes a 'penalty' to activities that occur from 10 p.m. to 7 a.m. The penalty assesses an additional 10 dB to the existing profile to account for additional annoyance associated with nighttime activities.

This model calculated three noise contours for demolition and large caliber exercises, based on CDNL, which include the LUPZ, Noise Zone II, and Noise Zone III categories. Associated dB allowances and land uses are described below:

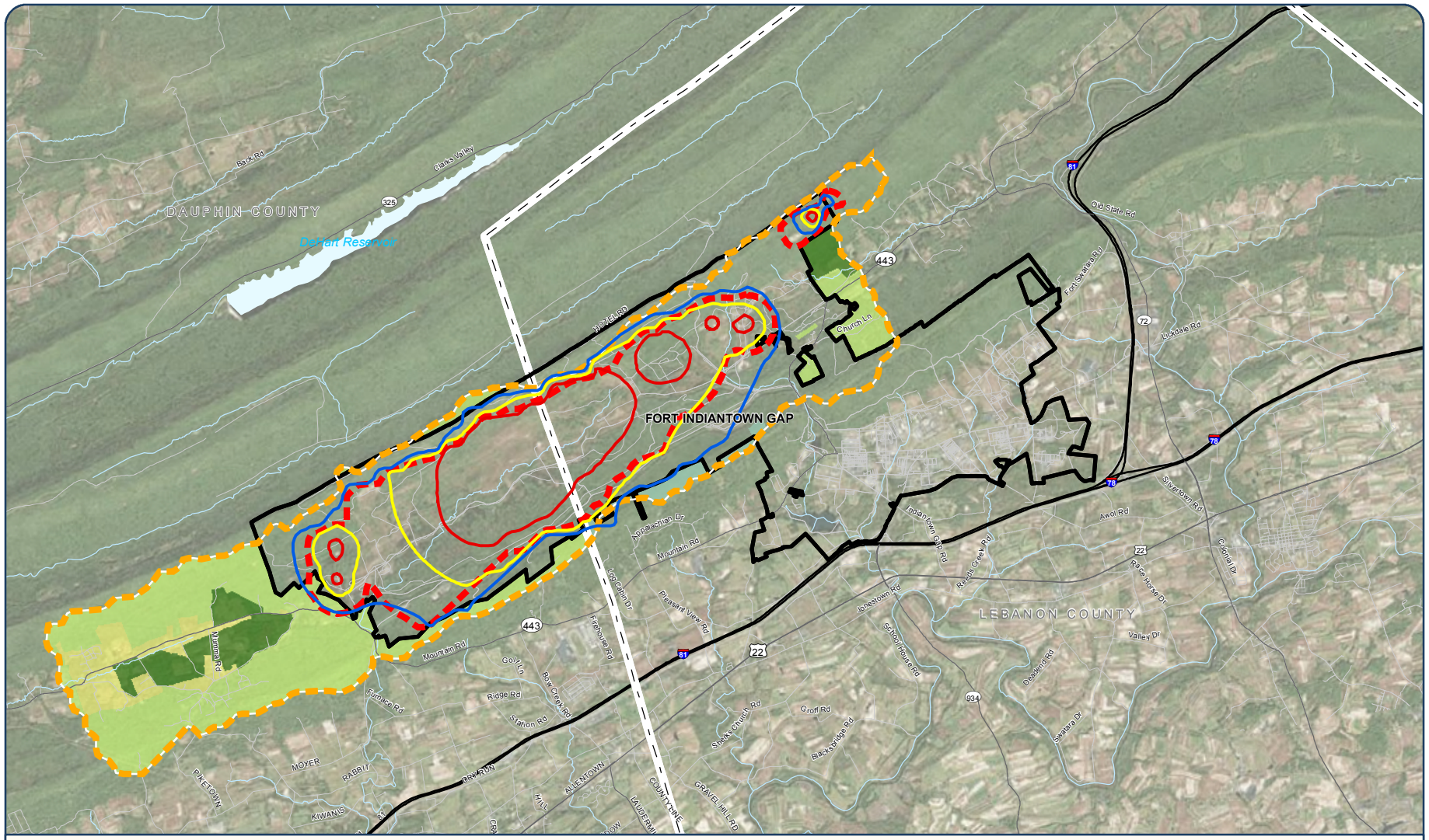
- LUPZ: Noise is expected to be in a range between 57 dB to 62 dB CDNL and noise-sensitive land uses are generally acceptable;
- Noise Zone II: Noise is expected to be in a range between 62 dB to 70 dB CDNL and noise-sensitive land uses are generally not recommended; and
- Noise Zone III: Noise is expected to be greater than 70 dB CDNL and no noise-sensitive land uses are recommended.

A review of the noise zones associated with explosives demolition and exercises involving large caliber shows that only the LUPZ extends off FTIG primarily in two locations: the extreme northeast corner of FTIG in Union Township and the extreme western boundary north of Manada Gap. These areas are illustrated on Figure 5-8.

The zones are based on averages, due to the long sound waves associated with the low frequencies produced by explosive demolitions and large-caliber weapons firing. These long sound waves can travel lengthy distances because they are not impeded by barriers – they travel right over the barrier. Poor weather can also influence sound travel. The Statewide ONMP, noted that the PK15(met) model, "is a good tool to use to indicate areas that may at times be exposed to high noise levels from individual events…[and] can be used to delineate areas of focus". Since weather is not a consistent variable, any experiences relating to higher than typical noise levels would be associated with a specific individual exercise.

When explosive demolition and large caliber exercises are conducted during unfavorable weather conditions at FTIG, the area associated with a moderate risk of complaint [115 dB – 130 dB PK15(met)] extends outside FTIG to the east and the west. To the east, the risk area extends approximately 3,280 to 4,100 feet and includes some residential properties

within Union Township. To the west, the risk area includes a much larger area − approximately 16,400 feet or a little more than three miles. Within this area, several churches are noted in addition to numerous residential properties.



Legend

Noise Contour
- LUPZ (52-62 CDNL)
- Zone II (62-70 CDNL)
- Zone III (>70 CDNL)

Noise Complaint Contours
- Medium Risk Area [115-130 PK 15(met)]
- High Risk Area [> 130 pK 15(met)]

- Fort Indiantown Gap
- County Boundary
- Interstate Highway
- Major Road / Streets
- Local Road
- Water Body
- River / Stream

0 1 2 Miles

Matrix DESIGN GROUP

Sources: PennDOT, 2013; FTIG, 2013; PASDA, 2013.

Figure 5-8: Large Caliber Noise Contours

Figure5-8_LargeCal_Noise_20150316_CJM.pdf

Given the magnitude of the area affected by demolition explosives and/or large caliber exercises conducted during unfavorable weather conditions, it could be possible that the noise perceived by affected residents and their concerns about affected livestock are attributable to these operational parameters. However, this possibility has not been confirmed as a part of this JLUS.

NOI-2	**Noise associated with aircraft.** ■ Flight activities and flights paths associated with FTIG occur and track off the installation; noise complaints increase when aircraft do not follow designated routes.

Flight activities and flight paths for both fixed- and rotary-wing aircraft occur both in and outside of FTIG. Typical operations for fixed-wing aircraft average two to three flights daily with few nighttime occurrences; operations for rotary-wing aircraft average 156 per day (about 90 during daytime and 66 during nighttime). Given the low quantity of fixed-wing aircraft (approximately four percent of the total aircraft utilizing MAAF), it is reasonably expected that the noise contours that were modeled for MAAF are primarily attributable to rotary-wing aircraft.

As previously stated, the rotary-wing aircraft at FTIG conduct closed-loop training at MAAF. The pattern established for the training moves in a circular pattern either north or south of MAAF: primarily to the south during the day and the north during the night.

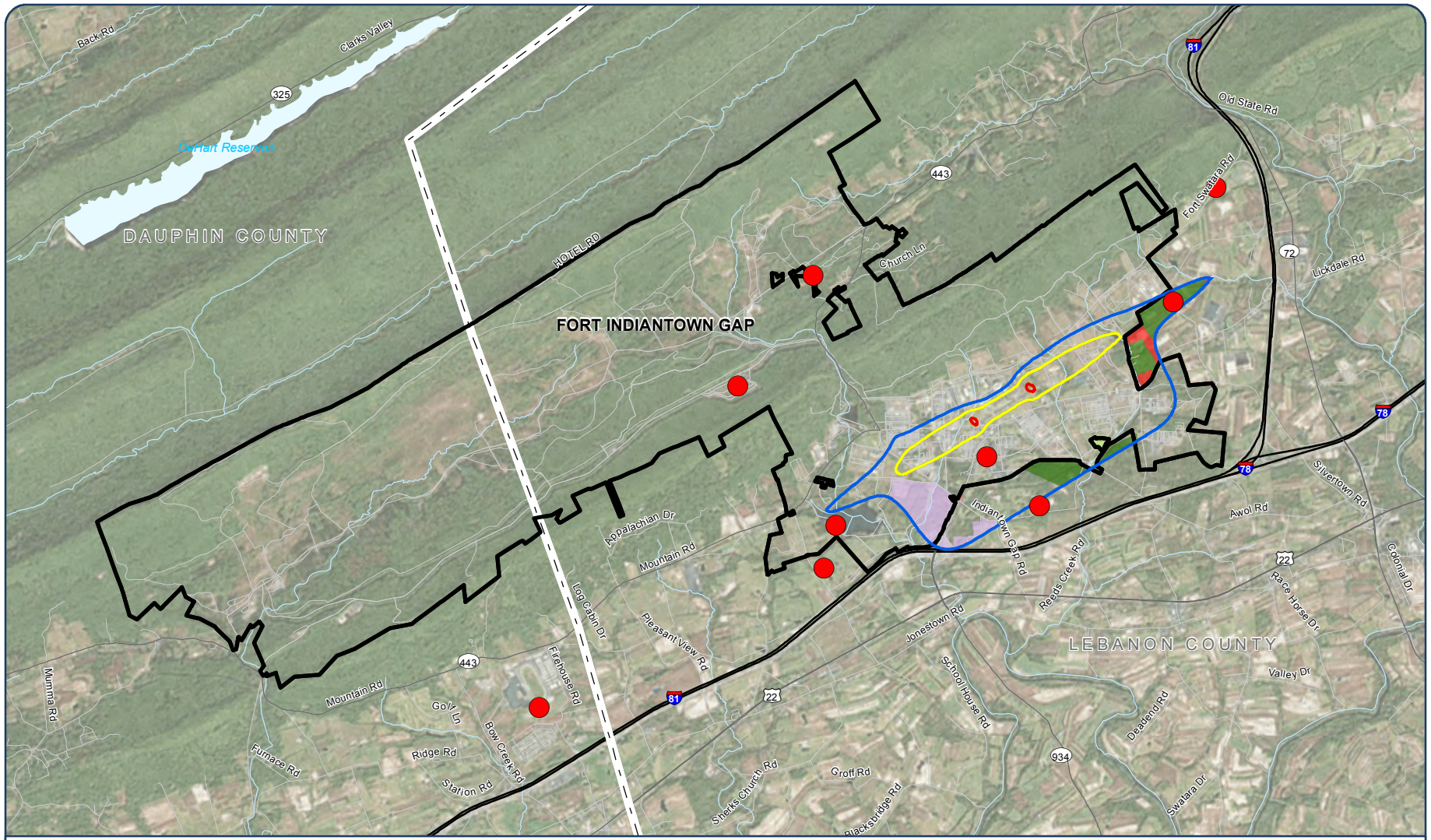
The noise modeling program (Noise Map/Baseops) used to produce the MAAF aircraft activity noise contour develops a sound profile and a corresponding noise contour through the input of all flights, types of aircraft, altitude at which the flights are occurring, and all flight tracks. Because the sound profile is attributed to transportation/military operation, an A-weighted day-night level (ADNL) is applied. The A-weighting serves to minimize higher and lower frequencies to more truly match the sound perceived by the human ear.

Given the factors that went into modeling the noise contours at MAAF, three types of ADNL-based noise contours associated with the activities occurring at MAAF were produced. These are Noise Zone II, Noise Zone III, and the LUPZ.

- Noise Zone III: Noise is expected to be greater than 75 dB ADNL and no noise-sensitive land uses are recommended;
- Noise Zone II: Noise is expected to be in a range between 75 dB to 65 dB ADNL and noise-sensitive land uses are generally not recommended; and
- Land Use Planning Zone: Noise is expected to be in a range between 65 dB to 60 dB ADNL and noise-sensitive land uses are generally acceptable.

As illustrated on Figure 5-9, the Noise Zone III and II contours associated with MAAF operations remain entirely within the FTIG boundaries. None of the residential inholdings are affected and no properties outside of FTIG are affected. The LUPZ extends outside of FTIG to the east and south. The contour shift to the southeast is due to the prevailing winds from the northwest; as the wind ‘pushes’ the aircraft noise to the southeast and enlarges the LUPZ. Where this contour extends outside of FTIG, land uses are limited to agriculture and suburban business. The suburban business land use area is associated with the commercial activities occurring adjacent to one of the primary entries into FTIG and associated I-81 interchange.

Other noise produced by rotary-wing aircraft unaffiliated with MAAF come from overflights associated with entry and departure of the NTA. Flights departing FTIG for approach into the NTA track within or adjacent to FTIG property.



Legend

Noise Contour
- LUPZ (60-65 ADNL)
- Zone II (65-75 ADNL)
- Zone III (>75 ADNL)
- Noise Sensitive No Fly Area

Zoning
- Agricultural
- Commercial
- General Commercial
- Industrial
- Light Industrial
- Open Space
- Fort Indiantown Gap
- County Boundary
- Interstate Highway
- Major Road / Streets
- Local Road
- Water Body
- River / Stream

0 0.75 1.5 Miles

Matrix DESIGN GROUP

Sources: PennDOT, 2013; FTIG, 2013; PASDA, 2013.

Figure 5-9: Aircraft Noise Contours

Figure5-9_Aircraft_Noise_20150316_CJM.pdf

The exception is when an aircraft reaches the eastern boundary of FTIG and must divert north to reach the training area. In this case the aircraft must fly over private property, which includes rural resource and natural areas. Upon return to FTIG, the rotary-wing aircraft exit the NTA far east of FTIG near Lake Strause and Lake Weiss. The aircraft must then return west to FTIG and fly over rural resource areas and suburban business areas before reaching FTIG boundaries. The rural resource area, where flight tracks are maintained to the maximum extent practicable, is narrow and abuts suburban neighborhoods/residential areas to the north and agricultural areas to the south. Depending on weather conditions, it is reasonable to expect that rotary-wing aircraft will, at times, slightly veer off of the optimal flight path and fly over the suburban neighborhoods / noise-sensitive areas.

Optimal flight paths have been mapped to avoid noise-sensitive land uses and no fly areas, such as:

1. The Penn National Race Course located east of FTIG in Dauphin County;
2. The Mt. Zion Seminary located adjacent to the southwest corner of FTIG's cantonment area;
3. The Memorial Lake State Park;
4. The ammunition storage point at FTIG, due to safety concerns;
5. The Moonshine Church located on one of FTIG's inholdings;
6. FTIG's main cantonment area;
7. The Indiantown Gap National Cemetery;
8. A private residence located on Bordnersville Road; and
9. The Probst chicken farm located east of FTIG.

Two additional areas of low-level overflight are the Special Use Airspace Restricted Areas and MTRs. Though there are no noise contours associated with these areas, the low-level altitude of aircraft has a direct noise impact on the areas below.

The Restricted Areas are located in the training corridor and north of FTIG. Restricted Area R5802B has a floor elevation of ground level with a ceiling of 13,000 feet above mean sea level (MSL), and is predominantly within the training corridor but includes some property inholdings north of the cantonment area and a small area west of the training corridor along Mountain and Fishing Creek Valley Roads. This area contains sparsely settled residences, small agricultural operations, and woodlands, and is the area most impacted area by low level flight within the Restricted Areas. Restricted Area R5802A with a floor elevation of 200 feet above ground level (AGL) extends north into State Game Lands No 211 and does not overfly private property or developed areas. Restricted Area R5802C has a floor elevation of 500 feet and ceiling of 16,999 feet AGL, and extends north of State Game Lands No 211 to the north side of the ridge along the Ridge Road Extension. Though this area is predominantly wooded, there are few sparsely settled residences in the area that would experience noise from low-level flight.

The MTRs associated with FTIG – VR-704, VR-705, and VR-707 have a floor elevation of ground level to 18,000 feet AGL. These one-way flight corridors are used to practice low altitude, high speed, terrain-following training missions. All three MTRs follow a single corridor approximately six miles north of FTIG that terminates at a navigation beacon in the Weiser State Forest in Dauphin County. Because the MTR corridor is 13 miles wide and aircraft may freely maneuver within the lateral and vertical confines of the MTR, the altitude of high speed aircraft can have a direct noise impact on uses below. The corridor width means that complete communities and boroughs are within the MTR and could be impacted by noise, including Lykens, Williamstown, Tower City, Reinertown-Orwin-Muir, Gratz, Berrysburg, Elizabethville, in addition to surrounding rural areas.

NOI-3	**Noise associated with night training activities.** ■ Noise complaints typically increase during/ following conduct of FTIG night training activities.

As explained with respect to the compatibility assessments for noise issues NOI-1 and NOI-2, the models used to produce the noise contours associated with the various FTIG training activities, whether weapons firing or aviation practice, took into account unfavorable weather conditions and penalties for nighttime operations. Both of these factors, as included in the modeling, exaggerate the noise contours produced in association with the activities. The land areas and uses affected by night training activities are the same as those land areas and uses mentioned in association with the small caliber weapons and aircraft training in issues NOI-1 and NOI-2.

Vibration

Vibration is an oscillation or motion that alternates in opposite directions and may occur as a result of an impact, explosion, noise, mechanical operation, or other change in the environment. Vibration may be caused by military and/ or civilian activities.

Compatibility Assessment

VIB-1	**Concern about vibrational effects on real property.** ■ Noticeable vibration from military activities (e.g., heavy/ large vehicle maneuvers and heavy weapons firing) is occurring outside FTIG, which is raising concerns by residents about potential property damage.

Some residents adjacent to FTIG have expressed concerns about the vibrations associated with training operations. These vibrations are generally the result of heavy weapons and explosive detonations, which take place primarily in the central portion of the installation. Some residents stated that occasionally training or explosives detonation will be so severe that it shakes their homes causing concern for damage to their homes or property. Under most circumstances, the distance between the source of the vibration and the structures that are off-installation would reduce the force generated by the vibration so that it would not cause any structural damage among the residential communities surrounding FTIG.

Sound associated with demolitions and other impulse noises are generally more likely to produce noise complaints. This is because these sounds tend to travel further, are harder to mitigate, and are often accompanied by vibrations that can impact quality of life or potentially cause structural damage to buildings, depending on how big and close they are. Studies done on vibration have shown that homeowners typically become concerned about potential structural damage due to rattling when the peak dB exceeds 120 dBP; however, actual damage is not likely to occur until a level of 150 dBP is reached.

Dust / Smoke / Steam

Dust results from the suspension of particulate matter in the air. Dust (and smoke) can be created by fire (controlled burns, agricultural burning, and artillery exercises), ground disturbance (agricultural activities, military operations, grading), industrial activities, or other similar processes. Dust, smoke, and steam are compatibility issues if sufficient in quantity to impact flight operations (such as reduced visibility or cause equipment damage), public health, or safety.

Compatibility Assessment

DSS-1	**Dust and smoke impacts outside FTIG.** ■ Dust and smoke from construction projects, training activities, and prescribed burns conducted by FTIG migrate and/or are carried by prevailing winds off of FTIG into public areas and private properties.

It is not uncommon for dust or smoke from communities adjacent to military installations to impact flight operations by contributing to reduced visibility. Similarly, dust or smoke can be generated on a military installation from fire or ground disturbances that could impact surrounding communities.

Controlled prescribed burning is performed at FTIG in accordance with the *Prescribed Fire Management Plan* (PADMVA 2004c). Prescribed burns are conducted to reduce the amount of fuel that can potentially burn and create an environmentally damaging wildfire. Prescribed fires are also conducted for maintaining the open nature of FTIG's grasslands by reducing tree and shrub cover and as a cost effective tool to control undesirable and exotic vegetation without the use of chemicals.

Controlled burning is conducted at least once a year within the Bollen Range and several times per year elsewhere throughout the installation. Although FTIG is not required to obtain permits to perform prescribed burns, advanced notification to the surrounding community and to local and state agencies is provided prior to each burn event.

Sensitive air quality receptors may be more susceptible to health conditions as a result of dust and smoke from prescribed burns and other activities conducted at FTIG. These sensitive air quality receptors include asthmatics, children, and the elderly, as well as specific facilities, such as long-term health care facilities, rehabilitation centers, convalescent centers, retirement homes, residences, schools, playgrounds, and childcare centers. Sensitive receptors located within a five-mile radius of the installation include: five schools outside FTIG, Mount Zion School of Ministers, and the Church of the Holy Spirit.

During the data collection and public involvement process conducted as part of the JLUS, it was noted that fires that occur on FTIG result in dust and smoke that migrate to agricultural areas and impair crop productivity. Depending on environmental conditions (which would include wind speed and direction, humidity, moisture content of the fuel source, etc.), the size of the area to be burned, and the amount of burn material, smoke from a prescribed burn can travel a substantial distance from the burn location.

Before FTIG personnel conduct any prescribed burn activities, a variety of weather and wind conditions are taken into consideration to estimate how much and where smoke will drift as a result of the burn. Burns are performed by properly trained personnel only when conditions such as humidity, wind and temperature are ideal for managing fires, and not conducted unless all required weather conditions are met. The purpose of this process if to minimize potential impacts of smoke from a prescribed burn on nearby areas, particular where sensitive air quality receptors are located. Upon review of this issue, a finding was made that no substantial compatibility issue exists and current procedures adequately address this condition.

The public can obtain information about prescribed burns via FTIG's website and social media page (Facebook page). Information about planned burns is also posted in local newspapers and media outlets to inform the public; however, sensitive receptors are not individually contacted at this time.

Light and Glare

This factor refers to man-made lighting (street lights, airfield lighting, building lights) and glare (direct or reflected light) that disrupts vision. Light sources from commercial, industrial, recreational, and residential uses at night can cause excessive glare and illumination, impacting the use of military night vision devices and air operations. Conversely, high intensity light sources generated from a military area (such as ramp lighting) may have a negative impact on the adjacent community.

Technology evolution has made it possible for warfare to excel at night. Night vision devices and other special operations tactics are deployed to enable strategic nighttime warfare. Thus, nighttime warfare enables the military to execute tactical operations under the cover of darkness. In order to be successful in combat, the military must train under conditions and environments similar to what is found in combat theaters. Night vision devices allow military personnel to train in near-daylight conditions during nighttime hours.

Technical Background

Under dark sky conditions, the use of night vision goggles (NVG) allows military personnel to view objects up to a distance of 300 meters (984 feet). Lighting located outside of an installation can decrease the NVG effectiveness to a distance of 50 meters (164 feet). Off-installation lighting, such as street lights or other elevated structures that is lit at night also produce a halo effect around objects, which further reduces visibility and resolution for air and ground personnel. The amount of ambient light experienced on the ground is a function of:

- intensity of nearby light sources (up to 20 miles away);
- distance from the sources;
- spectra of the light sources (blue light decays faster in the atmosphere);
- density of the cloud deck;
- height of the cloud; and
- relative humidity.

In measuring light pollution, the proximity to a developed area has a significant effect on the amount of light pollution that saturates the sky. With proximity twice as close to developed areas the sky glow appears to be approximately six times brighter.

Sky glow from communities typically diminishes in the later hours of the night, when businesses close and some lights are turned off. It follows that the area and amount of light pollution can/will increase as development continues to progress outward from a community. Increased light pollution can cause an increase in the amount of sky glow and ultimately create compatibility issues with military missions.

The impacts of the use of outdoor lighting on the dark skies over a military installation are primarily determined by two principal factors – the amount of developed land (density) and the distance of the developed land from the installation. The relationship between density and distance is best demonstrated using an estimate of urban sky glow called Walker's Law. The relationship captured through the use of this formula was developed based on measurements of sky glow for a number of cities in California. The following formula is used to estimate sky glow at an observing site looking at a zenith angle of 45 degrees toward an urban source:

$$I=C \times P \times R(n)$$

Where:

I = Percent increase of the night sky brightness above the natural background at 45 degrees down from directly overhead (facing the community, directly overhead is roughly ¼ of this value),

P = Population of the community,

R = Distance, in kilometers (km), from the observing site to the center of the community,

"C" = 0.01 for "R" values between 10 and 50 km, and

"n" = 2.5 for "R" values between 10 and 50 km

According to the National Oceanic and Atmospheric Administration (NOAA), the assumed radius of a community is a function of its population, ranging from 2.5 km to 24-km. Walker's law applies if the installation is outside the city radius. If located inside the community radius, the sky glow increases in a linear manner toward the center by another factor of 2.5.

Consider the following examples:

Scenario 1: A 100-acre development located two kilometers from the installation with a density of six units per acre (assuming 2.5 persons per household) would impact the sky background by over 260 percent (nearly 663 percent with NOAA factor).

Scenario 2: A 100-acre development located 20 kilometers from the installation with a density of six units per acre (assuming 2.5 persons per household) would impact the sky background by approximately less than one percent (just over two percent with NOAA factor).

If the density was decreased to one unit per acre the resulting scenarios would result in the following increased sky glow:

Scenario 1: Approximately 44 percent (almost 111 percent with NOAA factor).

Scenario 2: Approximately less than one percent (still less than one percent with NOAA factor).

In general, the following trends are demonstrated:

- The more dense the urban development, the greater the potential for light intrusion.
- The closer development is to the installation, the greater the potential is for light intrusion.

Compatibility Assessment

LG-1	**Night training opportunities.** ■ Lighting may limit helicopter and night vision training opportunities. ■ High-intensity lighting associated with the Hollywood Casino, Penn National Race Course, Hershey Amusement Park, and commercial development in Lickdale, PA creates and/or contributes to light pollution and/or sky glow. ■ If not controlled, residential lighting associated with new housing developments may contribute to light pollution and/or sky glow.

There are many factors that contribute to excess nighttime light that can interfere with nighttime training and night vision equipment. The types of exterior lights used, their distance from FTIG training areas, and the times at which they are left on all play an important role in how much ambient light is observed on the installation. Lower wattage light bulbs can be used in downward-pointed (shielded) lighting fixtures, to limit the lights extension and can also result in lower energy costs.

Rotary-wing aircraft operations that occur during nighttime hours typically consist of closed-pattern loop flights north of the runway at a height of approximately 900 feet AGL, and within a distance of less than 4,000 feet from the ends or lateral edges of the runway. However, some additional areas are used for nighttime flight training, depending on the needs of the unit or personnel, including 44,000 acres of SGL 211, north of Second Mountain. Ground operations also occur at FTIG that utilize night vision equipment, involve nighttime training with blackout driving. FTIG is ideal for training new heavy vehicle drivers so they can get a feel for the equipment on both paved and unpaved roads during day and night conditions

There are two sources of lighting that impact the use of night vision training at FTIG located southwest of the installation. The Penn National Race Course is a horse racing track that hosts races in the nighttime, on a typical schedule of four nights a week, 52 weeks a year. Since the races take place at night, the track is illuminated by bright stadium-type lighting that send light towards FTIG operating areas, reducing the effectiveness of night vision devices. The adjacent Hollywood Casino includes a large amount of parking illuminated by bright lights, which also impact dark skies at FTIG. Both of these sources affect night vision training near MAAF due to the intensity of the lights used.

On the east side of FTIG, a planned development for an industrial park called Logistics Park has been approved. While plans have been developed, no lots have been sold or built yet. The park is slated to include 1,800,000 square feet of industrial / warehouse space. Its location, adjacent to I-78 and I-81, is in close proximity to FTIG, and fairly close to MAAF. Depending on the type of development that occurs here and the intensity of the lighting, it could impact night training at FTIG if not properly managed.

Although more than 10 miles south of FTIG, Hershey, PA has several developments with bright lights, including Hershey Park and Hershey Park Stadium and Star Pavilion. When the facilities are in use or are under

certain weather events, causing the lights to be on, it could cause the light to be seen from FTIG and impact night training operations.

As the area surrounding FTIG continues to develop and experience new growth, this growth should be managed so that additional lighting impacts do not become problematic in the future. This could be accomplished through efficient lighting techniques, devices, and fixtures that prevent light trespass and include shielding.

The International Dark Sky Association (IDA) is an organization dedicated to the education and promotion of dark skies and dark sky preservation. The IDA has worked with communities around the world to develop methods for reducing light pollution. IDA-approved light fixtures are typically more expensive than less efficient fixtures during initial purchase, which is one reason people chose not to install them; however, energy costs could be recovered as early as one year after installation.

Downward directed, fully shielded, and low glare lighting, using efficient modern lighting sources and wattages appropriate to the needs for utility, safety, security and commerce, improves visibility and decreases energy waste and carbon dioxide emissions, reducing costs of operation for outdoor lighting systems. New installations using such efficient lighting systems accrue benefits and savings immediately. These benefits, accruing year-to-year, rapidly recoup costs associated with replacements to presently in-place lighting systems; all users benefit from the improved lighting efficiency needed to reduce light pollution.

Frequency Spectrum Interference / Capacity

Frequency spectrum impedance and interference refers to the interruption of electronic signals by a structure or object (impedance) or the inability to distribute/receive a particular frequency because of similar frequency competition (interference).

The military's use of frequency spectrum allows for safe operations and effective delivery of weapons on target without interference. The military's frequency spectrum needs for testing, evaluation, and training is constantly increasing, while the spectrum available for Department of Defense (DOD) use is decreasing. The National Telecommunications and Information Administration (NTIA) Office of Spectrum Management explains that:

> *"…almost every agency of the Federal Government uses the spectrum in performing mandated missions. The DOD uses the spectrum extensively for tactical uses and non-tactical uses. In the United States tactical uses are generally limited to a number of specific testing sites and training facilities, but DOD's non-tactical applications are extensive and include aircraft command and control, mobile communication in and around military bases, and air fields and long distance communications using satellite".*

Compatibility Assessment

FSC-1	**Demand for frequency spectrum.** ■ Commercial telephone carrier spectrum use is impinging upon and constraining FTIG spectrum use.

The Army employs tactical radio relay (TRR) to transmit information from one point to another. The TRR systems:

> *"Provide wide area communications for Army tactical deployment … [and] high-throughput data communications from command and control traffic to intelligence imagery, logistics, medical, and morale and welfare support".*
>
> *"The TRR systems operate like high-capacity cellular telephone systems with highly transportable base stations. The ability to set up, to establish a link to higher headquarters and subordinate units, and then to take the link down and to move it is key to the survivability of the headquarters units and supports the concept of maneuver warfare. Frequent field*

training is required to ensure that soldiers can quickly establish a network of tactical microwave links."

Source: (US Department of Commerce, 2012)

One method of transmitting information via TRR is through the use of high capacity line of sight (HCLOS) equipment. Training exercises using the HCLOS TRR system are performed at FTIG. FTIG is considered a "major HCLOS location" (US Department of Commerce, 2012). The HCLOS TRR system operates in two different ultra-high frequency bandwidths: 225-400 megahertz (MHz) and 1350-2690 MHz.

With regard to the use of the 225 to 400 MHz bandwidth, there doesn't appear to be much use outside of FTIG. The Lebanon County Emergency Management Agency utilizes a communications tower that operates at 453.950 MHz. This frequency use does not appear to be creating an interference issue with FTIG operations, since it is outside of the operational spectrum; additionally, it is not an adjacent bandwidth so it does not appear to be impinging on the FTIG capacity.

There are several towers used for wireless communications near FTIG. These towers are operated by commercial wireless carriers and communication infrastructure providers like Cingular Wireless Services and Nextel Communications and American Tower, respectively. The transmission of information associated with wireless communications occurs at a variety of bandwidths. There are several bandwidths operating within the parameters of FTIG's overall 1350-2690 MHz bandwidth: 1850-1910 MHz, 1930-1990 MHz, and 2305-2310 MHz. It is unclear if these commercial communication transmissions are directly interfering with FTIG's HCLOS transmissions as a result of using the same frequency or if there is a spillover from one frequency into an adjacent frequency from spurious emissions. Despite the cause, FTIG spectrum use appears to be affected by commercial carrier use within 1850-1910 MHz, 1930-1990 MHz, and 2305-2310 MHz bandwidths.

Public Trespassing

This factor addresses trespassing, either purposeful or unintentional, onto a military installation. Military areas that are located on, or adjacent to, public lands owned by other entities (i.e. federal, state, or local) designated for public access, recreation, or for livestock grazing often experience issues related to public trespassing into training ranges and other areas with safety hazards from to military operations.

Compatibility Assessment

PT-1	**Recreational users trespass onto FTIG.** ■ Individuals using State Game Lands – located directly north of FTIG, the Appalachian National Scenic Trail – located along the FTIG northern and eastern boundaries, and the Horseshoe Trail – located along the FTIG western boundary, occasionally trespass onto FTIG training areas, which results in safety issues for both FTIG and the trespassers.

The SGL that border FTIG to the north, east, and west provide a variety of opportunities for outdoor recreation enthusiasts, such as hunting, hiking, geocaching, and bird watching, among others. These activities draw local residents and tourists alike to the scenic hills and valleys that surround and encompass the FTIG training sites. Trails, parks, and conservation areas have been established in state and federal landholdings around FTIG to provide access to these natural assets. The SGL and FTIG are traversed by several prominent trails, including the Appalachian National Scenic Trail and Horseshoe Trail. While the major access points and overlooks along these trails and parks are clearly identified, gaps in trail delineations or FTIG boundaries create opportunities for both accidental and intentional trespassing onto FTIG lands. Prominent vistas or popular sites that encroach on FTIG property may attract people from established trails onto FTIG lands. This can present safety hazards to civilians and military personnel alike due to the nature of training exercises conducted at FTIG.

The SGL to the north of the installation is a popular hunting ground, which lead to frequent incidents of trespassing. FTIG maintains an active Deer Management Plan that includes provisions to endorse organized hunting activities to help control the deer population. According to the 2004 Deer Management Plan, in order to "ensure the safety of hunters and to avoid conflicts with authorized military training activities hunters are required to check for accessibility to the training areas and to sign in and out at the Hunter Check-in Station at Building 11-12 next to Range Control upon arrival to the installation" (FIG Regulation 210-15). While the plan specifies public check in on military lands, a lack of perimeter controls or inadequate public understanding of requirements and regulations reduces the effectiveness of this process.

Another concern is the safety risk trespassers present for military personnel. Trespassing poachers often carry weapon such as bows or high powered rifles to hunt game. The presence of unauthorized and armed persons at FTIG presents a potential force protection risk. Poachers are likely to discharge weapons wherever they find game; however, the firing of weapons on FTIG is strictly limited to firing ranges. Firing ranges have designated surface danger zones and impact areas designed to be large enough to contain munitions and their trajectories. Since training takes place throughout the installation, there is a high likelihood that poachers could discharge weapons in areas where soldiers are training and cause harm.

Coordinated efforts between local law enforcement officials and FTIG could greatly increase the abilities of personnel at FTIG to deter and detain trespassers and poachers alike.

PT-2	**Inadequate FTIG perimeter demarcation.** ■ The FTIG perimeter is not clearly marked in areas adjacent to private property. FTIG faces encroachment and potential loss of property via incorrect placement of improvements, e.g., fences by property owners on FTIG's perimeter.

Private development continues to encroach upon the borders of FTIG, particularly on the western edge as residential development expands into areas previously agricultural in nature. Recent development expansion is prominent along Highway 443 on the southwestern boundary of FTIG, as well as in the vicinity of Grantville and the Penn National Race Course. The lack of clearly established border fencing or demarcation may encourage expansion of private property onto FTIG lands. During the JLUS data collection and field investigation process, several instances of private property owners erecting fences in areas beyond their property limits and using these areas as personal property were observed. Although the FTIG perimeter is not clearly and consistently marked, an updated property survey was recently conducted by FTIG and has since been officially registered with local jurisdictions to increase private property owners' awareness of property boundaries.

Incidents of trespassing may be attributed to both private landholders who border FTIG as well as visitors unknowingly crossing onto FTIG lands. This can lead to an increase in the frequency of trespassing incidents without appropriate mitigation measures.

PT-3	**Intentional and unintentional trespass onto inholdings.** ■ The boundary between inholdings and FTIG land is indistinguishable in areas, resulting in unintentional trespass. ■ Despite posted signs clearly delineating inholding, visitors on FTIG disregard signage and trespass onto inholding.

Several private landholdings, referred to as inholdings, are located within FTIG. These private properties include land not purchased as part of FTIG in the 1930s when the base was established, and have remained in private ownership since that time. The open nature of FTIG allows civilian vehicles to traverse FTIG along Asher Miner Road (Highway 443) for access to multiple state parks and the Bashore Boy Scout Camp. Although public access is necessary, it has contributed to the number of trespassing violations on private landholdings.

Threatened and Endangered Species

A threatened species is one that may become extinct if protective measures are not taken to safeguard the species or its habitat. An endangered species is one that has a very small population and is at greater risk than a threatened species of becoming extinct. The presence of threatened and endangered species may require special development considerations and should be included early in planning processes to ensure compatibility with military missions.

Compatibility Assessment

TE-1	**State-listed rare species on FTIG.** ■ A Pennsylvania-listed rare butterfly species, the regal fritillary, has been identified at FTIG; FTIG is also host to regal fritillary habitat in range areas. Suitable habitat for the butterfly requires military training activity to disturb soils.

The existence of federally threatened or endangered species on a military installation could impact the ability of the military to fully perform its mission activities depending on the location and range of the species. The Endangered Species Act (ESA) establishes certain restrictions on the types of activity that can occur in known or protected habitat of threatened or endangered species. No threatened or endangered species are found on FTIG at this time. However, the presence of the rare regal fritillary butterfly on FTIG creates a unique situation to balance military operations with habitat protection. This butterfly is native to central Pennsylvania and was once found throughout much of central North America; however, today FTIG is home to the largest colony of this species. This is due to the preservation of the abundant grasslands on the installation associated with the training ranges. The regal fritillary butterfly is listed as critically imperiled in Pennsylvania.

The FTIG Final Integrated Natural Resources Management Plan (INRMP) was adopted in 2002 as a measure to protect the natural resources and biodiversity. This plan outlined approximately 160 acres of maneuver areas which were designated as prime habitat of the regal fritillary for study as part of an MOU between FTIG and The Nature Conservancy.

Prime butterfly habitat has been created by clear-cutting/controlled burn/ vehicle operations conducted at FTIG. To further the protection of regal fritillary while maintaining the intense training regimen of FTIG, the INRMP outlined the Habitat Management Plan for the Regal Fritillary in to catalogue butterfly populations, habitats, activities, threats, and issues. This plan was followed by the Restoration of Eastern Native Grasslands and the Repatriation of the Eastern Regal Fritillary Butterfly Management Plan adopted in September 2009 to provide guidance for protecting the butterfly species. The plan was produced as part of the DOD Legacy Resource Management Program and supports actions to repatriate the butterfly to regions within and around FTIG controlled lands. It also provides guidance for the maintenance of “natural grasslands” species to support the regal fritillary butterfly’s natural habitat. The objective is to

establish the native warm-season grassland habitats which will sustain long-term breeding butterfly populations.

The plan calls for three methods of maintenance to improve grassland areas: chemical, through the use of herbicides; mechanical, through the use of manual and machine labor to prepare appropriate habitats; and combustible, through appropriate prescribed fire techniques. These methods will help to establish and sustain appropriate butterfly habitats while preventing the spread of introduced grassland species.

FTIG conducts annual tours to increase public understanding and appreciation of natural resource preservation efforts. These tours help raise awareness of conservation efforts at FTIG and provide dialogue for future management plans and programs.

Land / Air Spaces

The military manages or uses land, air, and sea space to accomplish testing, training, and operational missions. These resources must be available and of a sufficient size, cohesiveness, and quality to accommodate effective training and testing. Military operations and civilian activities can compete for limited space; use of shared resources can impact future growth in operations and activities for all users.

Compatibility Assessment

LAS-1	**Adjacency of FTIG inholdings to training areas.** ■ The locations of inholdings on FTIG affect the FTIG's ability to conduct some training operations.

When FTIG was created in the 1930's for use by the Pennsylvania National Guard (PNG) the State purchased many properties to aggregate the installation's land area. Not all properties within the FTIG boundaries were purchased, resulting in private inholdings within the installation. The majority of the inholdings are located off of PA Route 443 north of FTIG's cantonment area and within the FTIG training areas. Some of the inholdings are located adjacent to PA Route 443 and do not require separate egress through the training areas; others, however, are located west of PA Route 443 off of Neuins's Lane and Tomstown Road adjacent to Training Areas B-07, B-08, B-9, B-11, and B-12.

In 2001, the PNG was selected to host one of six Stryker Brigade Combat Teams (SBCT). The PNG was the only reserve component selected for transformation; all other SBCTs were transformed from other active Army components. To support the transformation into a SBCT, the additional training facilities of a design and capability to train soldiers for action in urban terrain environments like those encountered in the Middle East were needed. One concept that was designed to simulate this urban environment was the Combined Arms Collective Training Facility (CACTF). To analyze and implement the CACTF needed for the newly formed SBCT, the PAARNG conducted the *Transformation of the PAARNG's 56th Brigade Environmental Impact Statement* (EIS) in 2006. All CACTFs are based on a standard Army design. The EIS provided the following description for a CACTF:

> *"The CACTF is designed to conduct multi-echelon, full-spectrum operations training…and replicates an urban environment. The facility consists of 2.25 square kilometers (km2) (approximately 560 acres) of urban sprawl with 20 to 26 buildings, roads, alleys, parking areas, underground sewers, parks, athletic fields, and command and control buildings. The actual size and configuration of any CACTF depends in part on the local installation's site requirements and local topography. The CACTF is designed to support heavy and light infantry, armor, artillery, and aviation positioning and maneuver. Buildings are arranged in a realistic urban pattern. The CACTF represents an area consisting mainly of residential, commercial, public, institutional, and light industrial buildings".*

The only sites on FTIG large enough to accommodate the CACTF and not displace other existing training facilities were locations in Training Areas

B-11 and B-12 and one additional inholding site on Neuin's Lane and Tomstown Road.

Given the time and expense of acquiring the inholdings, the PAARNG opted to move forward with only CACTF Phase I. Phase I provided for the construction of a CACTF (-), which is a smaller version of a full CACTF or CACTF(+), on 20 acres east of the Tomstown Road and Neuin's Lane inholdings. The CACTF(-) was completed in 2008. The CACTF Phase I only provides 50 percent of authorized buildings at a low training level.

The CACTF, as it currently exists, provides the urban setting needed to accomplish training requirements for the SBCT. However, since the PAARNG lacked both the funding and the time required to acquire the inholdings needed to construct the CACTF(+), only a CACTF(-) was built. The CACTF(+) and the full complement of training exercises and scalability for a full SBCT were limited due to the inholdings located on FTIG.

Compatibility Awareness Factors

Although a factor may not present a current threat to the installation or the community, it may possess the ability to become a factor. Should conditions change, adjacent or proximate development increase, or other factors become apparent, new conflicts with existing or future missions and operational activities at FTIG could arise. The following compatibility factors were considered and evaluated as part of the JLUS process; however, no current or foreseeable issues were identified.

Energy Development

Development of energy sources, including alternative energy sources (such as solar, wind, or biofuels) could pose compatibility issues related to glare (solar energy), vertical obstruction (wind generation), or water quality / quantity.

Local Housing Availability

Local housing availability addresses the supply and demand for housing in the region, the competition for housing that may result from changes in the number of military personnel, and the supply of military family housing provided by the installation.

Air Quality

Air quality is defined by numerous components that are regulated at the federal and state level. For compatibility, the primary concerns are pollutants that limit visibility (such as particulates, ozone, etc.) and potential non-attainment of air quality standards that may limit future changes in operations at the installation or in the area.

Cultural Resources

Cultural resources may prevent development, apply development constraints, or require special access by Native American tribes, other groups, or governmental regulatory authorities.

Legislative Initiatives

Legislative initiatives are federal, state, or local laws and regulations that may have a direct or indirect effect on a military installation to conduct its current or future mission. They can also constrain development potential in areas surrounding the installation.

Water Quality/Quantity

Water quality/quantity concerns include the assurance that adequate water supplies of good quality are available for use by the installation and surrounding communities as the area develops. Water supply for agricultural and industrial use is also considered.

Scarce Natural Resources

Pressure to gain access to valuable natural resources (such as oil, natural gas, minerals, and water resources) located on military installations, within military training areas, or on public lands historically used for military operations, can impact land utilization and military operations.

Roadway Capacity

Roadway capacity relates to the ability of existing freeways, highways, arterials, and other local roads to provide adequate mobility and access between military installations and their surrounding communities.

Appendix

The following Appendix is provided as supplemental materials to support the JLUS process, recommendations, and final reports. The Appendix provides a compilation of the public comments received during the FTIG JLUS Public Draft review period that occurred in November 2014, including the responses and actions taken which are reflected in the final JLUS documents.

Please see the next page.

Comment	Name	Concerns/Comments	JLUS Document Location	Response
1	Anon (from Public Meeting-Dauphin County)	Low flying aircraft create noise and vibration.		Concur. Of the noise contours generated at FTIG based on modeling, most are contained within the installation – some extend west of the Training Corridor into Dauphin County. A section on the Special Use Airspace and low-level Military Training Routes – the area of low-level flight - was added to Background Report Chapter 3. A discussion of this issue was added to Issue NOI-2 in Chapter 5 of the Background Report. The area of low-flight per the Special Use Airspace R-5802A, R-5802B, and R-5802C was added to the Noise Military Compatibility Area Noise Awareness Area and the Military Compatibility Area Overlay District in the JLUS Report Chapter 6. This expanded Noise Awareness Area is now included in the JLUS recommendations for noise and vibration associated with aircraft that track off the installation (COM-1B Establishing and Advertising a Single Point of Contact, COM-1C, Expanding Communication Efforts, COM-2A Initiating a Community Awareness Program, COM-2D FTIG to Conduct a Good Neighbor Program, NOI-2A Amending Building Codes, NOI-2B Educate Local Builders on Sound Attenuation, and VIB-1A Prepare a Damage Claims Package).
2	JEL	Northern Lebanon School District opted to provide for a school district wide recreational plan, which isn't mentioned.	Pg. 2-8 under Parks and Recreation.	Concur. Added to the first sentence, "Due to the rural nature of the region, there is an abundance of nearby parks and recreational facilities including a school districtwide recreational plan in Northern Lebanon County."
3	JEL	Under Economic Impact, the $100 million impact is impressive, but it's not broken down by county like other statistics, nor is it broken down by on-base and off-base impacts. These would be informative and useful statistics to have as there are shopping and dining options as well as athletic facilities and a movie theater and other recreational venues on base.	Pg. 3-3	For Information Only. The only available data specific to FTIG is provided at the level noted in the report. Though economic impact numbers are prepared at the county level by the Pennsylvania National Guard, they are not broken down by source. Given that the Pennsylvania National Guard operates in some 90 communities within the commonwealth, it is not possible to definitively identify the economic impact for study area jurisdictions specifically from FTIG. It should be noted that FTIG recently provided updated economic impacts data for FTIG – for Fiscal Year 2014 this number was $573 Million. The JLUS reports have been updated to reflect this current figure.
4	JEL	At one point, I read where FIG may expand to the Monroe Valley Golf Course. That's fine, but the Course lies in Swatara	Pg. 3-10	For Information Only. According to the FTIG Real Property Master Plan there are no plans to acquire the Monroe Valley Golf Course over the 25-year planning horizon of

Comment	Name	Concerns/Comments	JLUS Document Location	Response
		Township. Therefore, it is my opinion that Swatara Township should be more fully represented in this study. Further, the municipalities of Bethel Township and Jonestown Borough are impacted by noise, fly-overs, traffic….		the Plan. The golf course is also located outside the acquisition area under the Army Compatible Use Buffer program. According to the FTIG Real Property Development Plan, due to proximity from the installation, Swatara Township experiences minimal adverse effects of noise generating activities from FTIG (though new development near the runway final approach has increased the number of complaints) and Jonestown Borough is not adversely impacted by noise generating activities from FTIG. Bethel Township is an additional 10 miles east of Jonestown Borough. Noise contours do not extend this far east of the installation, nor are these areas within the low-level flight Special Use Airspace or under the Military Training Routes associated with FTIG. Though the jurisdictions noted did not participate in the JLUS Study, they may independently consider adopting JLUS recommendations relevant to their communities in the interest of compatibility planning.
5	JEL	The Lebanon County Comprehensive Plan encourages regional planning by school district. Regional does not recognize school districtwide planning.	Pg. 4-5	For Information Only. The Lebanon County Comprehensive Plan was consulted and analyzed for compatibility with FTIG. Land use strategies in the JLUS include incorporating military compatibility areas and compatibility policies into Comprehensive Plans and local zoning codes, and providing opportunities for FTIG to participate in local planning to encourage uses compatible with FTIG in the future.
6	JEL	Cornwall, Lebanon, and Palmyra have completed regional Comprehensive Plans, which provide opportunity for one municipality to host a certain type of use, such as mining or adult venues, while others may opt not to provide for every type of land use. This could help municipalities protect FIG from Mining activities.	Pg. 4-14	For Information Only. The Lebanon County Comprehensive Plan was consulted and analyzed for compatibility with FTIG. Cornwall and Palmyra did not participate in the JLUS. While regional Comprehensive Plans promote a community vision unique to a municipality, the JLUS considers all land uses within the military footprint associated with an installation. In the case of FTIG, only the Outer Horizontal imaginary surface extends out as far Cornwall and Palmyra which are applicable to vertical obstructions. Vertical Obstruction strategies are included in the JLUS.
7	JEL	Controlled burns are understandable to control weeds and invasive species, but there is no mention of invasive species or	Pg. 5-29	For Information Only. The JLUS recognizes the desire for greater public input, notification, and coordination regarding decisions that are made by FTIG that can

Comment	Name	Concerns/Comments	JLUS Document Location	Response
		FIG honoring "no burn" ordinances issued by the County of Lebanon during times of drought when there is a water shortage.		impact areas outside the installation. All burns are coordinated with local authorities by the forestry department. Residents are notified in advance via: phone, email, web postings, social media postings and press releases. The JLUS strategies include recommendations to coordinate with local governments and provide public review and comment on military planning to help minimize incompatibility and provide greater transparency. Issues such as prescribed burns should be coordinated with Lebanon County during sensitive environmental conditions.
8	JEL	For clarification, concerning the vertical obstruction known as Lebanon County's 911 tower proximate to the initial climb area when departing from MAAF to the west, will FIG pay for both land and expenses to relocate this tower?	Pg. 5-13	For information only. There are three towers in the Approach and Departure Surface west of MAAF. It is unclear whether the 911 tower constitutes a hazard to aircraft; however, the any matter concerning the relocation of this tower was not contemplated as part of the JLUS. The purpose of the JLUS is to prevent incompatibility through communication and coordination before it occurs. The JLUS includes strategies for coordinating future tower siting and approvals. Any action regarding the 911 tower, should be resolved between Lebanon County and FTIG.
9	JEL	Concern that noise buffer does not adequately address noise issues. Noise from FIG rolls southeast across Lebanon County	(Pg. 5-20-23 and 5-26).	For Information Only. The noise contours provided in the JLUS are based on most current statistical modeling data provided to the JLUS development team. The two types of noise contours included in the JLUS are for range firing (small and large caliber munitions) and aircraft. Noise below 65 decibels or 120 PK15 (met) are generally considered acceptable for all uses. Of the noise contours generated at FTIG based on modeling, most are contained within the installation – some extend west of the Training Corridor into Dauphin County. Noise modeling for FTIG activities used in the JLUS was last updated in 2006. Changes in type of munitions and aircraft can affect the noise model.
10	JEL	The closing segment is a delicate mention of the possibility that companies may want to drill for natural gas at FIG. Again, in the interest of public safety and security, noise and vibration from ordinance explosions…seem to preclude any such accommodation. "Pressure to gain access to valuable natural resources (such as oil, natural gas, minerals, and water	Pg. 5-38	For Information Only. Any desire to drill at FTIG was not disclosed during the JLUS development. The statement regarding drilling was provided in Chapter 5 as an awareness issue to be monitored into the future. This is as much an issue for safety of personnel, facilities and operations at FTIG as it is a concern for general public safety. Any future interest in drilling should be part of the communication and coordination as recommended in the JLUS strategies.

Comment	Name	Concerns/Comments	JLUS Document Location	Response
		resources) located on military installations, within military training areas, or on public lands historically used for military operations, can impact land utilization and military operations."		
11	JEL	Concerns about the noise and vibration impact on the Williams Natural Gas pipeline and the possibility of explosions.		For Information Only. The potential impact of activities at FTIG on the proposed natural gas pipeline is outside the scope of the JLUS. Such a consideration should be resolved between the Pennsylvania National Guard and Williams Partners as part of the review process and communicated to surrounding communities.
12	JEL	Local Housing Availability is impacted by pipeline company's employees and competition for housing may result in more need than originally thought for military family housing provided by the installation.		For Information Only. The potential need for temporary housing associated with the pipeline construction would likely increase the local demand for housing. Military housing was identified in the JLUS as an issue for ongoing monitoring and awareness. The impacts of temporary construction on the local housing market should be monitored into the future.
13	JEL	In addition to Union and East Hanover Townships, I believe that the entire Northern Lebanon School District should be written into the plan.		For Information Only. The jurisdictions participating in the JLUS have the capacity and authority to execute comprehensive planning policy and land use regulations to promote compatible planning with FTIG. The Northern Lebanon School District is incorporated in the JLUS as part of Lebanon County and subject to the goals and policies included in the County Comprehensive Plan. Per the Comprehensive Plan, cooperative and collaborative planning is a goal led by Lebanon County with the School District as a support partner. The impact and consistency of planning by school district with respect to growth areas and corridors is facilitated at the county level recognized in the JLUS.
14	JEL	In addition to sharing Routes 81, 78, and 22, Bethel Township shares air space via Grimes Airport (p3-14 Outer Horizontal Surface), borders restricted air space, and (p 3-9 & 10) under Aviation indicates a possible expansion of runways. Has FIG considered approaching Alletta Schadler to purchase Grimes Airport?		For Information Only. The proposition of acquiring a satellite airport should be presented to FTIG for consideration. However, the Grimes airport would require substantial improvement since it is unpaved, is not central to existing facilities, and abuts two public roads which would generate safety and noise zones, and vertical obstruction thresholds that would have an impact on the surrounding community.

Comment	Name	Concerns/Comments	JLUS Document Location	Response
15	DS	Low flying helicopters and planes and gun fire cause noise and vibrations that shake houses.		Concur. Of the noise contours generated at FTIG based on modeling, most are contained within the installation – some extend west of the Training Corridor into Dauphin County. A section on the Special Use Airspace and low-level Military Training Routes – the area of low-level flight - was added to Background Report Chapter 3. A discussion of this issue was added to Issue NOI-2 in Chapter 5 of the Background Report. The area of low-flight per the Special Use Airspace R-5802A, R-5802B, and R-5802C was added to the Noise Military Compatibility Area Noise Awareness Area and the Military Compatibility Area Overlay District in the JLUS Report Chapter 6. This expanded Noise Awareness Area is now included in the JLUS recommendations for noise and vibration associated with aircraft that track off the installation (COM-1B Establishing and Advertising a Single Point of Contact, COM-1C, Expanding Communication Efforts, COM-2A Initiating a Community Awareness Program, COM-2D FTIG to Conduct a Good Neighbor Program, NOI-2A Amending Building Codes, NOI-2B Educate Local Builders on Sound Attenuation, and VIB-1A Prepare a Damage Claims Package).
16	DS	How does the natural gas pipeline affect Ft Indiantown Gap?		For Information Only. The potential impact of activities at FTIG on the proposed natural gas pipeline is outside the scope of the JLUS. Such a consideration should be resolved between the Pennsylvania National Guard, Williams Partners, and the surrounding communities as part of the pipeline review process.
17	MR	What is the minimum altitude of aircraft operating off installation?		For Information Only. The flight altitude is governed by the airspace surrounding FTIG as authorized by the FAA. There are five areas of restricted airspace surrounding FTIG covering differing geographies and elevations. The parameters of the restricted airspaces have been added to Section 3 of the Background Report.
18	Anon	What is the timeline for closing Fisher Avenue?		For Information Only. The timeline for implementing the FTIG Controlled Perimeter Plan was unknown as of the date of the JLUS. The planning and execution of this is activity should be coordinated with the public per recommendations in the JLUS.
19	Anon	Consistent with the County Comprehensive Plan, are all Northern Lebanon School District municipalities engaged?		For Information Only. The JLUS included those municipalities that elected to participate in the study.

Comment	Name	Concerns/Comments	JLUS Document Location	Response
20	Anon	Concern that development in East Hanover Township is occurring without required utilities.		For Information Only. How development is permitted is outside the purview of the JLUS. The JLUS is a proactive approach to achieve a balance to sustain the mission at FTIG and the economic development viability of the local communities. Any concerns with permitting and adequate utility infrastructure should be conveyed to the township leadership for consideration.
21	Anon	Concern about the cost to taxpayers to maintain it and keep FTIG running.		Fort Indiantown Gap is primarily funded through federal Department of Defense dollars (96 percent). Annual congressional budget allocations have a direct impact on FTIG operations and readiness. The cost to operate the installation is outside the purview of the JLUS.

November 18, 2014

Joint Land Use Study Committee

Dear Sirs:

Thank you for the opportunity to provide comment on the Joint Land Use Study between Fort Indiantown Gap and the County of Lebanon. First, I don't know of any other PA county that supports our veterans as much as Lebanon County does. We have a trifecta right here in Lebanon County—we train troops at Fort Indiantown Gap; care for veterans at the VA Medical Center; and bury them with honors at the National Cemetery. In short, Lebanon County loves, honors, and appreciates our veterans.

That being said, I would like to share some observations on the Background Report:

The **Lebanon County Comprehensive Plan encourages regional planning by school district**. Regional on p 5 does not recognize school districtwide planning. In addition to **Annville Cleona School District** (p4-14), **Cornwall Lebanon, and Palmyra** have completed regional Comprehensive Plans, which provide opportunity for one municipality to host a certain type of use, such as mining or adult venues, while others may opt not to provide for every type of land use. This could help municipalities protect FIG from Mining activities. Further, **Northern Lebanon School District** opted to provide for a school district wide recreational plan, which **isn't** mentioned on p 2-8 under Parks and Recreation.

At one point, I read where FIG may expand to the Monroe Valley Golf Course. That's fine, but the Course lies in **Swatara Township**. Therefore, it is my opinion that Swatara Township should be more fully represented in this study. Further, the municipalities of Bethel Township and **Jonestown Borough** are impacted by noise, fly-overs, traffic…. "The FTIG study area is primarily served by two Interstate Highways, and is supplemented by a system of lesser highways and arterial roads. The two primary routes connecting FTIG to other regions are I-81 and I-78. (p2-6)." In addition to sharing Routes 81, 78, and 22, **Bethel Township** shares air space via Grimes Airport (p3-14 Outer Horizontal Surface), borders restricted air space, and (p 3-9 & 10) under Aviation indicates a possible expansion of runways. Has FIG considered approaching Alletta Schadler to purchase Grimes Airport? (p 4-7): Readiness and Environmental Protection Initiative "…willing landowners to limit encroachment and incompatible land use through land acquisition by the establishment of conservation easements, land trusts, or the purchase of property. The program provides funding to support these land acquisition efforts to preserve the land around military installations, wildlife habitats, and local communities." In summary, in addition to Union and East Hanover Townships, I believe that the **entire Northern Lebanon School District** should be written into the plan.

It is my personal observation that military families stay in the Lickdale hotels and frequent local restaurants like Wendy's, which are off-base. However, under **Economic Impact**, the $100 million impact is impressive, but it's not **broken down by county** like other statistics, nor is it **broken down by on-base and off-base impacts**. These would be informative and useful statistics to have as there are shopping and dining options as well as athletic facilities and a movie theater and other recreational venues on base.

So that people do not accidentally trip unexploded ordinances, the **fenced perimeter** seems like a good idea.

For clarification, concerning the **vertical obstruction** known as **Lebanon County's 911 tower** proximate to the initial climb area when departing from MAAF to the west, will FIG pay for both land and expenses to relocate this tower (p5-13)?

Sound is identified in the study indicated by imaginary lines around FIG. I am NOT complaining, but sound from FIG does roll southeast across Lebanon County (p5-20-23 and 5-26). I lived in Lickdale for decades, but currently live in West Lebanon where I still hear shooting exercises, and military aircraft does fly over my home, which appears to be outside of the closed loop. I'd be more concerned if I didn't hear or see signs of activity from FIG. To me, these are the sounds of freedom. Let freedom ring.

Controlled burns are understandable to control weeds and invasive species, but there is no mention of invasive species or FIG honoring "no burn" ordinances issued by the County of Lebanon during times of drought when there is a water shortage (P5-29).

What about the proposed Williams pipeline? The **noise and vibration** has to have a negative impact on these gas lines, either by metal wearing thin, or the possibility of explosions. Also, **Local Housing Availability** is impacted by pipeline companies, whether it is apartments, hotel rooms, or long-term camping sites. Therefore, competition for housing may result in more need than originally thought for military family housing provided by the installation.

The closing segment is a delicate mention of the possibility that companies may want **to drill for natural gas** at FIG. Again, in the interest of public safety and security, noise and vibration from ordinance explosions…seem to preclude any such accommodation. "Pressure to gain access to valuable natural resources (such as oil, natural gas, minerals, and water resources) located on military installations, within military training areas, or on public lands historically used for military operations, can impact land utilization and military operations. (p 5-38)

Thank you for entertaining my comments on the Background Report. I will attempt to finish reading the 92-page Public Draft. Perhaps some of my observations will be addressed there, and this set of comments is unnecessary. However, if not, and other circumstances prohibit me from completing a timely review, then these comments were submitted prior to the November 28 deadline.

Sincerely,

Commissioner Jo Ellen Litz
400 S 8th St.
Lebanon PA 17042

Julie Cheyney,

After reading with interest the article regarding FTIG land use study in Sat. Nov. 15, 2014 paper I find it very hard to believe that they generate 480 million dollars to the local economy. They failed to mention how much it cost the taxpayer to maintain & keep the Dep up & running.

There is alot of waste & pork at FTIG. There our soliders & state employees using military vehicles & state vehicles for there own personal use. It states on the vechicle, for official use only. As a taxpayer what am I getting for my taxpayer dollar.

Back in the 90's the Brack Comission had slated to close the Dep to training & let it open to Logistics, Supply, Maintenance, Administrive duties ETC. I think it was an excellent idea to do back than & today also.

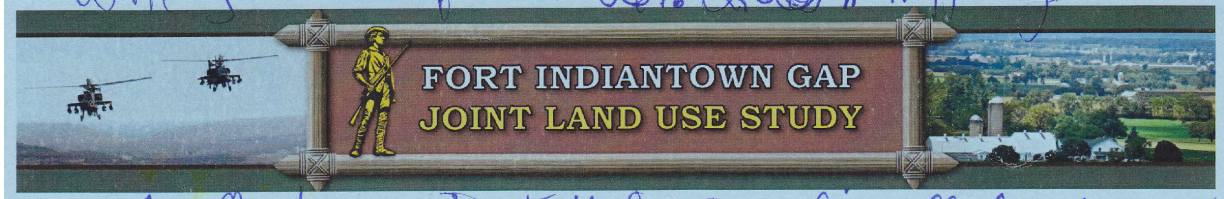
Kathleen Tahudy
98 Tomstown Rd.
Jonestown, PA 17038-8158

HARRISBURG PA 171
24 NOV 2014 PM 4 L

Ms. Cheyney
400 S. 8th ST.
Room 206
Lebanon, PA. 17042

17042675455

Will you answer questions? 861. 2007 happening



Thanks for coming to Union Township, off of the base. It feels more friendly and personal.

Comments

Your comments are VERY IMPORTANT to the development of this Plan and will be taken into consideration throughout the project duration.

1) Please consider placing a copy of the document at Fredericksburg's Matthews Library too.
2) How does the pipeline impact FIG?
3) Where does "closing tests Are" through FIG Timeline stand?
4) Consistent with the County Comprehensive Plan, are all Northern Lebanon School District municipalities engaged?
5) Will local contractors be used for perimeter fence installation?

Please return this comment form to the registration table or to a project representative.

over

6) What is a floating air craft carrier?
7) Respectfully the noise buffer is vague as noise rolls across the Lebanon Valley during trainings.

FORT INDIANTOWN GAP
JOINT LAND USE STUDY

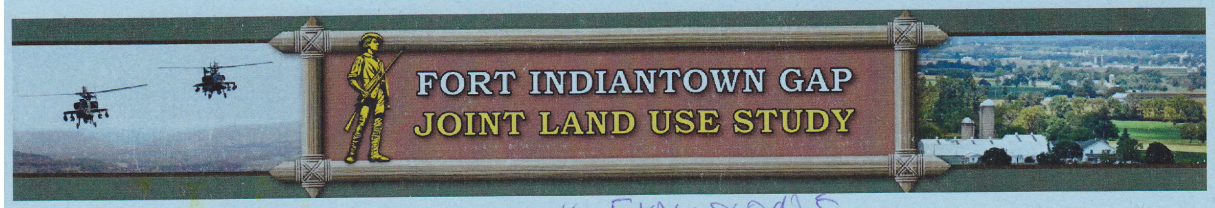
Comments

Your comments are VERY IMPORTANT to the development of this Plan and will be taken into consideration throughout the project duration.

After 25yr living in East Hanover Twsp in same house - I now live with helicopters flying low over my house shacking house rattling dishes. The ↑ frequency & volume of gun fire & tank killer planes shakes my house but what infuriates me the most is the ever increasing building permits without regard for the 1950s electrical grid - ↑ brownouts & electrical outages. met Ed

Please return this comment form to the registration table or to a project representative.

does NOT upgrade or maintain - they only jerry rig repairs for failures in contrast to PP&L that upgrades to IMPROVE electrical service. No wind farms, no solar & NO regard for H_2O & septic. EAST Hanover Twsp does NOT enforce requirements for septic - out houses people permitted (by EH Twsp supervisors) to urinate & defecate where they wish. Clean water is important - Development must address water - this is all private wells. Septic & chemicals get into ground water. Electrical upgrade is essential to any development. Taxes ↑ x 4 & property ↓ in value due to noise & crap ordinance enforcement



Comments

Your comments are VERY IMPORTANT to the development of this Plan and will be taken into consideration throughout the project duration.

Noise and Vibrations * EXPLOSIONS caused by JLUS can cause the gas pipelines or block the Gas Pipeline

I live on Bordnersville Road, They are putting the Atlantic Natural Gas Pipeline through my property which is attached to Cavalry Road and Red Horse Air Guard on FTG. Also I do NOT want this to take place nor do I want my property affecting my property. The vibrations of the air facility on the FTG could vibrate this pipeline and cause it to explode

Please return this comment form to the registration table or to a project representative.

Vibrations from guns - ranges - aircraft can set off the Natural Gas pipe line that is only 3 ft underground - These vibrations can cause the pipeline to explode

Donna Stickler
188 + 196 Bordnersville Road
Jonestown

FORT INDIANTOWN GAP
JOINT LAND USE STUDY

Union township 188 + 196 South Bordnerville Road

Comments

Your comments are VERY IMPORTANT to the development of this Plan and will be taken into consideration throughout the project duration.

188 + 196 South
My land as on Bordnerville road I oppose all expansion of FIG that cause vibrations - noise it will all affect my home + my parents home and cause hearing, explosion, noise affecting my family

Anna Steckler
188 + 196 Bordnerville Rd
Jonestown

Please return this comment form to the registration table or to a project representative.

FORT INDIANTOWN GAP
JOINT LAND USE STUDY

Comments

Your comments are VERY IMPORTANT to the development of this Plan and will be taken into consideration throughout the project duration.

I WOULD LIKE TO KNOW WHAT THE MINIMUM ALTITUDE OF AIRCRAFT (ROTARY WING, FIXED WING AND UNMANNED AERIAL VEHICLES) OPERATING OFF OF INSTALLATION IN DAUPHIN COUNTY. PLEASE FEEL FREE TO CONTACT ME AT (785) 375-4419 (CELL). I RESIDE IN DAUPHIN COUNTY (EAST HANOVER TOWNSHIP).

MARTIN RAFALKO (martinrafalko@hotmail.com)

Please return this comment form to the registration table or to a project representative.

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Matrix DESIGN GROUP