

**BY ORDER OF THE  
SECRETARY OF THE AIR FORCE**

**AIR FORCE HANDBOOK 32-7084**

**2 NOVEMBER 2017**

**Civil Engineering**

**AICUZ PROGRAM MANAGER'S GUIDE**



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OPR: AFCEC/CP

Certified by: HQ AF/A4CP  
(Col James F. Downs)

Supersedes: AFH32-7084, 1 March 1999

Pages: 78

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This publication aligns with AFI 32-7063, *Air Installations Compatible Use Zones Program* (2015). This handbook provides base and wing level command leadership, Air Installations Compatible Use Zones (AICUZ) Program Managers (PM) and Installation Encroachment Team (IEMT) members an overview of the Air Force's AICUZ Program and provides specific guidance concerning the organizational tasks and procedures necessary to implement the program. It is written in a "how to" format to guide the reader through the AICUZ program and implementation process. The use of the name or mark of any specific manufacturer, commercial product, commodity, or service in this publication does not imply endorsement by the Air Force. Ensure that all records created as a result of processes prescribed in this publication are maintained IAW Air Force Manual (AFMAN) 33-363, *Management of Records*, and disposed of IAW Air Force Records Information Management System (AFRIMS) Records Disposition Schedule (RDS). Refer recommended changes and questions about this publication to the Office of Primary Responsibility (OPR) using the AF Form 847, *Recommendation for Change of Publication*; route AF Forms 847 from the field through the appropriate functional chain of command.

### **SUMMARY OF CHANGES**

This document has been substantially revised and must be completely reviewed. Major changes include deletion of the templates for the AICUZ study, Citizen's brochure and Implementation and Maintenance Plan, the deletion of the data collection chapter, and the Environmental Impact Analysis Process Chapter. New material includes updated compatible land use recommendation tables for clear zones and APZs and noise zones.

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## CHAPTER 1

### AICUZ OVERVIEW

**1.1. Introduction.** “If you lived here, you’d be home by now.” We’ve all seen that sign outside military air installations. Military airfields attract development – people who work on base want to live nearby while others want to provide services to base employees and residents. When incompatible development occurs near an installation or training area, affected parties within the community may seek relief through political channels that could restrict, degrade or eliminate capabilities necessary to perform the defense mission. The Department of Defense (DoD) established the AICUZ program to promote proactive, collaborative planning for compatible development to sustain mission and community goals.

#### **1.2. The History of AICUZ.**

1.2.1. Most Air Force installations were built during or prior to the 1940s in relatively remote areas. This remoteness allowed flight training, air combat maneuvering and bombing practice all in the same county. In the years since, aircraft have steadily evolved from riveted aluminum-skinned airframes to exotic metal and composite platforms that operate at significantly higher speeds and generate exponentially more noise. Today’s aircraft operate in all weather and take advantage of the night. These aircraft can network together and strike targets over the horizon – where before, their training footprint may have been located within a single county, today’s aircraft often train over multiple states.

1.2.2. While Air Force aircraft and missions have evolved, the surrounding communities have not stood still. Following the end of World War II (WWII), the United States population surged, riding the baby boom wave of the late ‘40s and early ‘50s. The population of the United States grew from 144 million in 1947 when the Air Force was formally established, to 320 million in 2015. The population spread out from urban centers, aided by the National Interstate and Defense Highways Act of 1956. Veterans who had trained throughout the southwest during WWII, returned to the scorched regions tamed by the advent of air conditioning, establishing thriving communities outside once remote military installations.

1.2.3. The origins of the AICUZ program go back to the early 1950s when a series of civilian aircraft accidents prompted President Truman to appoint General James Doolittle (USAF Ret.) to establish a commission to review these accidents and develop flight safety recommendations. The report, “The Airport and Its Neighbors,” included a comprehensive analysis of airport land use, planning and airfield safety considerations, including effective zoning regulations to control land use near airports. The report noted similarities between civilian and military airports and their effects on surrounding communities.

1.2.4. As early as 1957, the Air Force established procedures for estimating noise exposure and gauging community reaction to aircraft operations. By 1964, the Air Force was working on the relationship between land use planning and aircraft noise. Even then, the Air Force recognized the need to address noise from a land use planning perspective.

1.2.5. The late 1960s and early 1970s saw the beginning of the environmental movement. Emphasis on incorporating environmental concerns into the planning process was a major push. Notable events included Air Force research on sonic boom exposure in the 1960s, the

Federal Aviation Administration's (FAA) civilian aircraft certification requirement and passage of the National Environmental Policy Act (NEPA) of 1969, and the Noise Control Act of 1972. These developments increased DoD awareness of noise exposure issues, encouraging the institutionalization of its programs.

1.2.6. In 1971, the Air Force introduced the "Greenbelt" concept to address the growing problem of incompatible development around airfields (encroachment). The idea behind greenbelts was to establish buffer zones around installations through the purchase of real property. For obvious cost and budget considerations, the concept proved to be economically infeasible.

1.2.7. The Noise Control Act of 1972 initiated a Federal program to regulate noise pollution with the intent of protecting human health and minimizing annoyance of noise to the general public. While this was a significant step forward in reducing the public's exposure to aircraft noise, the Act did not apply to military weapons or equipment, effectively exempting the DoD from having to comply.

1.2.8. In 1973, DoD established the AICUZ program. This program established policies and guidelines to protect military operational capability. It accomplishes this goal by avoiding incompatible development that would prevent military installations from changing or expanding operations to meet new mission requirements. The Air Force and Navy released their first AICUZ studies in the mid-1970s followed by individual service instructions.

1.2.9. Through the AICUZ program, the Air Force has been successful in encouraging the adoption of state-level enabling legislation for planning compatible development around military airfields throughout the United States, including Arizona, Texas, Florida, and Alabama. Other states, such as California, have adopted legislation after recognizing the need to protect all airfields from encroachment. The Air Force encourages the adoption of enabling legislation for this purpose and cooperates with the appropriate state and local authorities regarding its implementation.

**1.3. Program Objectives.** The goals of the AICUZ program are simple – to protect the health, safety and welfare of our neighbors from the effects of aircraft operations while ensuring the continued viability of the defense flying mission. To achieve these goals, AICUZ promotes development compatible with aircraft operations.

1.3.1. The AICUZ study must be consistent with current land use planning principles and procedures as well as current techniques in noise assessment methodology. It must also describe current – and often projected – air operations, provide recommendations for compatible land use development, and support local long-range land use planning efforts adopted in accordance with nationally recognized standards. The AICUZ should relate to state laws, enabling legislation, and local economic and political conditions. The AICUZ is not an end in itself but rather one of many tools used by planners (on base and off) and decision makers to make reasonable land use decisions. The AICUZ study must have a factual and rational basis.



## CHAPTER 2

### THE AICUZ STUDY

**2.1. Introduction.** At the heart of the AICUZ program is the AICUZ study. AICUZ studies are prepared by the Air Force to assist local communities planning development near air installations through implementation of land use controls. The study describes airfield operations and depicts zones of greatest accident potential and high noise. The study also identifies other land use-related concerns and contains recommendations for compatible development.

2.1.1. The recommendations within the studies are non-binding – local communities have responsibility for land use development. Since Air Force recommendations are only advisory, it is important that the installation take an active role with the community in AICUZ program implementation (discussed in the [Chapter 5](#)).

2.1.2. Details on the AICUZ study content, including a study template, may be found at the AFCEC/CP Regional Development SharePoint® site under the AICUZ Program Toolbox Tab at <https://portal.afcec.hedc.af.mil/CP/CPP/CPPR/SitePages/Home.aspx>.

**2.2. Accident Potential .** On 3 April 2006, a C-5B Galaxy crashed short of the runway, while attempting a heavyweight emergency landing at Dover Air Force Base, Delaware. The aircraft took off from Dover AFB 21 minutes earlier and reported an in-flight emergency 10 minutes into the flight. All 17 people aboard survived but two received serious injuries. Upon impact, the aircraft broke apart into three major pieces on a grassy area surrounding the base's fenced perimeter. No one on the ground was injured because the land had been left undeveloped as part of the AICUZ program.

2.2.1. While the chances of an accident are remote, mishaps do occur and proper land use planning can reduce risk to persons on the ground. In the 1970s and 1980s, recognizing the need to identify areas of accident potential, the military conducted studies of historic accident and operations data throughout the military. An analysis of aircraft accidents within 10 nautical miles of an airfield for the period of 1968-1972 led to defining areas of high accident potential known as the Clear Zone, Accident Potential Zone I (APZ I), and Accident Potential Zone II (APZ II). CZs and APZs are areas where accidents are most likely to occur if they occur – they are not predictors of accidents.

2.2.2. Clear Zone. The Clear Zone begins at the end of the runway and is the area of highest accident potential; it has few land uses that are compatible. The Air Force concluded that the Clear Zones warranted special attention due to the high incidence of accident potential severely limiting acceptable land uses and, consequently, has spent tens of millions of dollars to acquire real property interests within the Clear Zone.

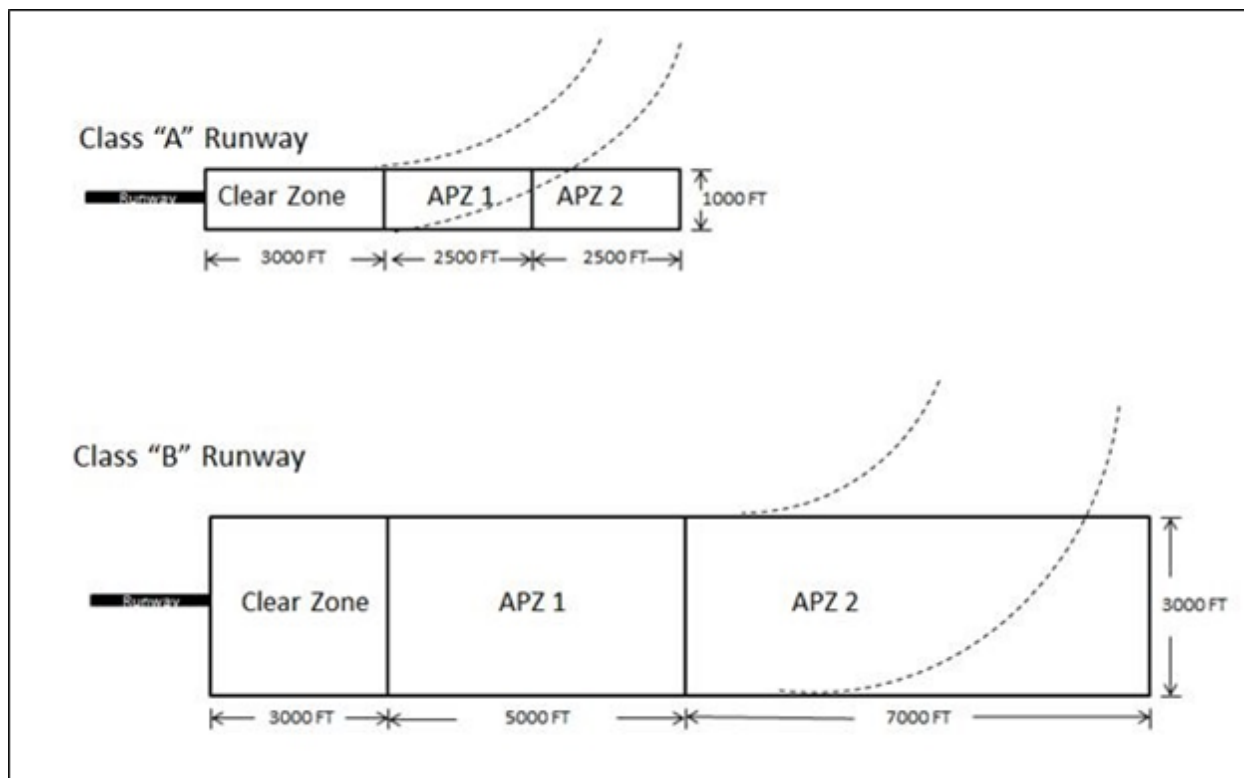
2.2.3. Accident Potential Zones. The percentages of accidents within the two APZs are such that, while purchase is not necessary, some type of land use control is essential. APZ I lies beyond the Clear Zone and is of lower but still considerable accident potential. APZ II is beyond APZ I and possesses less accident potential than APZ I but still warrants land use restriction recommendations. The Air Force recommends limiting the number of people within APZs through focused land use planning.

2.2.4. Figure 2.1 shows Clear Zones and APZ dimensions for Class “A” and Class “B” runways. See AFI 32-7063 for definitions and guidance on modifying these zones (including



their application to rotary wing aircraft). The AFCEC/CP Regional Development SharePoint® site: (under the AICUZ Program Toolbox tab at <https://portal.afcec.hedc.af.mil/CP/PPP/PPPR/aicuz/Forms/AllItems.aspx>) also has additional reference guidance on Clear Zones and APZs.

**Figure 2.1. Clear Zones and Accident Potential Zones for Fixed Wing Aircraft.**



**2.3. Aircraft Noise.** Although there are a number of noise sources on an air installation, AICUZ studies generally do not include noise from military or civilian vehicles, generators or Aerospace Ground Equipment (AGE) as aircraft noise often dominates the noise environment. Joint Bases are likely to have military noise sources other than aircraft that may need to be included (i.e., small arms firing, demolitions, etc.) in their AICUZ study. Discussions of incorporating ground weapons noise into an AICUZ study are included in this chapter and in Section 3.5.2 of the AFI 32-7063.

2.3.1. When DoD implemented the AICUZ program in 1973, the services adopted the NOISEMAP computer program to describe noise impacts created by aircraft operations. NOISEMAP is one of two Environmental Protection Agency (EPA) approved programs for measuring noise in the airfield environment. The other is the Integrated Noise Model (INM) that was used until recently by the FAA for civil airports. FAA has since incorporated INM into their new Aviation Environmental Design Tool (AEDT). .

2.3.2. While some civil airports use live noise monitoring along with noise modeling, the Air Force uses only modeled contours. Modeling allows for anticipated changes in aircraft and operational tempo. This is important for beddown studies prepared under NEPA and allows bases to project a planning contour several years into the future, which will provide communities with stability for their long term planning (see Section 2.5).

2.3.3. The next significant event in the development of the military noise program was the 1974 EPA designation of the noise descriptor “DNL”, or Day-Night Average Sound Level. DNL does not reflect the actual sound level experienced at any point in time. It refers to the average sound level exposure, measured in decibels (dB) on the A-weighted scale, over a 24-hour period, with a 10-dB penalty for operations occurring during the hours of 10:00 p.m. to 7:00 a.m. The penalty accounts for the increased annoyance created by noise events that occur during this time. In 1974, the Administrator of the EPA, under authority in the Noise Control Act of 1972, recommended all federal agencies adopt the DNL noise descriptor system. The Air Force and EPA agreed that all AICUZ studies would be prepared in DNL.

2.3.4. The development of DNL was an important milestone in the AICUZ program. It provided a single descriptor for the noise level that provides noise contours for land use planning. This reduced confusion, increased credibility, and allowed for comparative research efforts on the effects of noise.

2.3.5. DNL is used today throughout the United States, with the exception of California which uses a similar metric called Community Noise Equivalent Level (CNEL). CNEL adds an additional 5 dB weighting for aircraft operations during the evening hours of 7:00 p.m. to 10:00 p.m. In general, CNEL contours average a little larger than DNL contours. While State law may require the use of a different descriptor (such as CNEL in California), DNL is always used for on-base contours. Noise contours for the off-base aviation noise environment at overseas bases are prepared only in consultation with the overseas Major Commands.

2.3.6. Noise is represented on an AICUZ map using contours. Just as a topographic map connects points of equal elevation in contours, the AICUZ map contour connects points of equal noise value. All AICUZ maps using DNL will display noise contours of 65, 70, 75, 80, and 85 dB DNL to analyze land use compatibility in the AICUZ study. For California installations, the maps should display 60, 65, 70, 75, 80, and 85 dB CNEL contours. State law requires airport maps in California to display a 60 dB CNEL noise contour. Outside California, contours less than 65 dB DNL are not required but may be provided if local conditions warrant discussion of lower noise levels, such as in rural and desert areas, or where significant noise complaints have been received from areas outside the 65 dB DNL contour. AFCEC/CP is available to assist installations in determining whether lower contours are warranted.

2.3.7. DNL/CNEL noise contours reflecting the current mission operations are developed by using an installation’s aircraft operation and maintenance data and the latest DoD approved version of the NOISEMAP noise model. DoD is currently developing a new program, the Advanced Acoustic Model (AAM), for an eventual replacement of NOISEMAP. Once approved for use, the Air Force will use AAM alone or in combination with NOISEMAP (as appropriate) to generate airfield noise contours.

2.3.8. DNL/CNEL noise contours are based on Average Annual Day (AAD) of airfield operations in accordance with AFI 32-7063. This requirement is based on the fact that land use compatibility tables were created using AAD. AFCEC/CP archives copies of noise model input and output files for all AICUZ studies.

2.3.9. Military and civilian noise planning efforts have benefited from mutual interest. One area is research and development. Developing quieter engines for the KC-135, for example,

came about through commercial efforts to reduce fuel costs and noise impacts of the Boeing 707. Other efforts have gone into developing hush houses, where engines can run at full power with dramatically reduced noise effects to the surrounding environment. Noise abatement procedures can be, and often are, integrated into flight scheduling and aircraft operating procedures. Modifications to flight tracks, imposition of quiet hours and use of preferential runways are all techniques used by both the military and civilian airfields to reduce noise. Most installations have used noise reduction techniques to their maximum degree, and compatible land use planning and controls are the answer for further protection of the community.

**2.4. Ground Weapons Noise.** With the inception of Joint Bases within DoD, we now see more bases where both aircraft operations and ground weapons training activities (small arms, large caliber weapons or explosives) occur, adding another dimension to military noise that should be disclosed to the public. For the most part, the different noise sources use separate delimiters and metrics and cannot be merged into a single set of master contours for all noise sources but should each be plotted separately. Many bases have small arms ranges, and/or Explosive Ordnance Disposal (EOD) proficiency training ranges. Small arms ranges may employ a variety of weapons under .50 caliber. EOD proficiency ranges may include areas for training with small amounts of explosives (up to five pounds net explosive weight) and for demolition of old munitions in an emergency. Because range planners base the noise zones for these ranges on the loudest weapon (or the largest allowed munition charge) and not the number of annual operations conducted at the range, peak contours are used to reflect the loudest level that occurs at each receiver location.

2.4.1. Since the sound of small arms is relatively localized when compared to other weapon systems, noise is typically only a concern up to 1000 meters behind the firing point. However, since the direction of fire may not always be directly away from the boundary, installations should model the noise when the range footprint is within 3000 meters of the boundary. NOTE: Ground ranges are defined using metric measures; therefore, do not use standard United States measurement systems for distances associated with ground training ranges.

2.4.2. Noise from small arms ranges, demolition or EOD proficiency ranges may be included in an AICUZ study as a way to provide information to local communities about this noise source. Unless the training tempo has the possibility of increasing in the future, installations that use these ranges infrequently should consider whether asking local communities to incorporate land use controls for these noise sources is warranted. See AFI 32-7063, *Air Installations Compatible Use Zones Program*, section 3.5.2, for guidance on these noise sources in AICUZ studies.

**2.5. Planning Contours.** Long-range planning by local land use authorities involves long-range strategies to influence present and future land uses. Frequent AICUZ updates and changes to land use recommendations by the Air Force can undermine a community's willingness to adopt AICUZ land use recommendations into their comprehensive plan or enact land use controls over the AICUZ footprint. See Section 3.5.3 of AFI 32-7063 for planning contour guidance.

2.5.1. A planning contour is a long range projection (usually 5-10 years) of the future flying mission at the installation. Long range planning requires local land use authorities to project as far into the future as is practicable, changes that would influence the development for their community. If the military only provides a noise contour reflecting present mission, it leaves

the community in a quandary. Should they adopt land use controls for a contour that may change with the next mission? The planning contour alleviates uncertainty. By projecting possible mission changes as far into the future as practicable, the Air Force can help add stability to the community planning process.

2.5.2. Planning contours are the best available, realistic long-range projections of unclassified estimates of future mission requirements. They start with the low hanging fruit – are there any decisions on an aircraft beddown or realignment that have been made but the action has not started, or it is only partially completed? Another consideration might be to include newly proposed beddowns or mission change actions, or the retirement of legacy aircraft, that could affect the noise contours. Planning contours must be based on reasonable conclusions of how the flying mission will evolve, and cannot be based on classified information.. They are not commitments of future operations, nor should one portray it that way in the AICUZ study (e.g., the study should not state that a new aircraft **will** be based at that installation). Guidance for developing planning contours, and when not to use them, is included in Section 3.5.3 of AFI 32-7063.

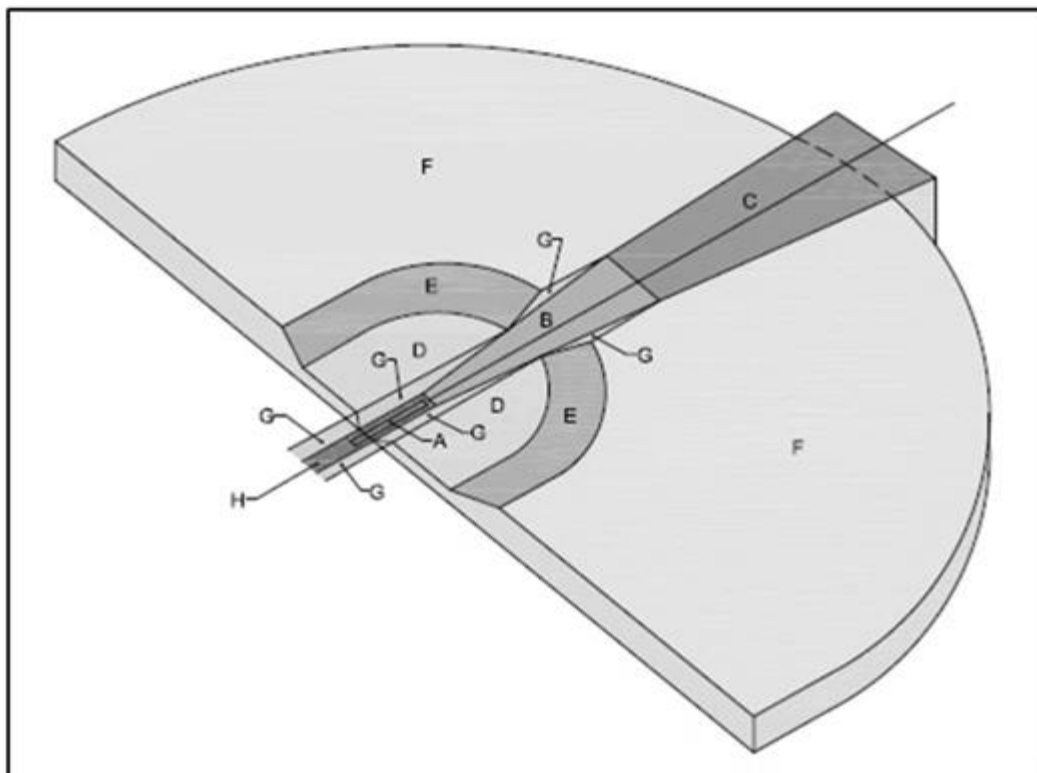
2.5.2.1. If an assumption used in the development of the planning contours actually becomes a proposed Air Force action, the proposal and reasonable alternatives will be appropriately analyzed in compliance with the Air Force's EIAP guidance. Conversely, if the operations at a base using planning contours in its AICUZ study change in a way that was not part of the assumptions, or the current operations at the base are otherwise modified, the AICUZ study may need updating.

2.5.2.2. In situations where reasonable estimates of projected aircraft operations are not available, the local land use authorities are not open to long-range projections, or where little or no change to aircraft operations is expected in the next five to 10 years, the current contours may be used to represent the installation's noise impact instead of a separate planning contour.

**2.6. Hazards to Aircraft Flight Zone (HAFZ).** Certain land uses and activities can pose potential hazards to flight. The HAFZ is defined as the area within the Imaginary Surfaces that are described in the UFC 3-260-01, and in Federal Aviation Regulation (FAR) Part 77, *Objects Affecting Navigable Airspace*, Subpart C, Obstruction Standards. Examine land uses proposed in this area for compatibility.

2.6.1. Height. Tall objects can pose significant hazards to flight operations or interfere with navigational equipment and radar systems. This concern can be further complicated where there are major changes in terrain elevation close to the military airfield. Objects, such as building can block radar but also, along with transmission lines, cell towers, and even trees, can create a flight hazard by penetrating navigable airspace. City/County agencies involved with construction permit approvals should require developers to submit calculations, which show that projects meet the height restriction criteria of FAA Part 77, for the specific airfield described in the AICUZ study.

Figure 2.2. Imaginary Surfaces for Class B Runway.



*Note: The edge of the outer horizontal surface (F) extends to 44,500 feet from the runway centerline.*

#### LEGEND

- A** Primary Surface
- B** Approach-Departure Clearance Surface (50:1 Slope Ratio)
- C** Approach-Departure Clearance Surface (Horizontal)
- D** Inner Horizontal Surface (45.72m [150'] Elevation)
- E** Conical Surface (20:1 Slope Ratio)
- F** Outer Horizontal Surface (152.40m [500'] Elevation)
- G** Transitional Surface (7:1 Slope Ratio)
- H** Runway

2.6.2. Visual Interference. Activities that result in smoke, dust, or steam or may otherwise cause interference with flight activities are generally not compatible with air operations. Smoke or steam generated by nearby businesses, industry, or field-burning operations can create severe visual interference during air operations. Dust and smoke can be created by fire (controlled burns, agricultural burning), ground disturbance (agricultural operations, grading), industrial activities, or similar processes. While these uses may be initially incompatible, mitigation may reduce the severity of the impact. For instance, watering before plowing will reduce dust.

2.6.3. Light Emissions. Bright lights, either direct or reflected, in the airfield vicinity can impair a pilot's vision, especially at night. A sudden flash from a bright light causes a spot or "halo" to remain at the center of the visual field for a few seconds or more, rendering a person virtually blind to all other visual input. This is particularly dangerous at night when the flash can diminish the eye's adaptation to darkness. The eye usually achieves partial recovery in minutes, but full adaptation typically requires 40 to 45 minutes. Sources of direct or indirect (reflected) light emissions are a land use compatibility issue when Aircrew, maintainers, air traffic controllers or airfield operations personnel are unable to obtain necessary distance of view, distinguish airfield surfaces, markings or lighting, cannot see other air traffic or obstructions; or cannot properly train due to artificial light sources affecting nighttime training activities. Light sources can include spotlights, streetlights, laser light shows, fireworks, buildings with reflective glass surfaces, and some solar energy technologies.

2.6.3.1. Glint/Glare potential from Photovoltaic (PV) Panels. The potential for glint and glare from PV panels is extremely rare. However, depending on materials or the siting of the panels, there may be the potential for glint and glare impacts to Air Traffic Control (ATC) cabs and/or pilots on approach or departure to airfields. To find out if glint/glare from PV arrays in relation to the HAFZ may pose a problem, the Air Force uses the Department of Energy's Sandia National Laboratory Solar Glare Hazard Analysis Tool (SGHAT), in accordance with AFI 32-7063.

2.6.3.1.1. Standards for Objection.

2.6.3.1.1.1. Due to the fixed location of air traffic control facilities, prolonged exposure to glare has the potential to affect safety of operations; therefore, zero glare from PV panels is the compatibility standard at the ATC cab.

2.6.3.1.1.2. The standard for glint/glare on approach or during other tactical maneuvers near the airfield is to eliminate any potential for glint/glare or low potential for after-image along the final approach path or landing thresholds. SGHAT can only evaluate straight in approaches using a three-degree glide path. At installations where military aircraft execute tactical approaches or overhead patterns, to include closed patterns, or have glide slopes other than three degrees, supplement the standard SGHAT analysis to ensure there are no operational impacts from proposed PV arrays. Analysis must include plotting a series of observation points along the alternate final approach paths and conduct an SGAHT analysis for each point.

2.6.3.1.2. Mitigating circumstances may be present which would warrant a determination that, notwithstanding the results of an SGHAT or other glint/glare analysis, the potential mission impact associated with a proposed solar PV array is within an acceptable range. See AFI 32-7067 for more information on SGHAT. Contact AFCEC/CP for assistance with the SGHAT analysis.

2.6.4. Bird/Wildlife Aircraft Strike Hazard (BASH). Assess the development of potential bird attractants, such as storm water management ponds, landfills, waste transfer stations, wildlife refuges, and agricultural uses against BASH criteria. The AICUZ PM needs to be familiar with the installation BASH plan. The installation BASH program manager and the Natural Resource Manager need to be members of the Installation Encroachment

Management Team. See the Air Force Safety Center website for further information on BASH, at <http://www.afsec.af.mil/aviationsafetydivision/bash/index.asp> and on the Air Force portal at <https://www.my.af.mil/gcss-af/USAF/ep/globalTab.do?channelPageId=s6925EC1334F60FB5E044080020E329A9>.

2.6.5. Electromagnetic Interference (EMI). New generations of military aircraft and their associated weapons systems are highly dependent on complex electronic systems for navigation and other critical flight and mission-related functions. Consequently, use caution in siting any activities that create EMI. EMI can be induced intentionally, as in forms of electronic warfare, or unintentionally, as a result of spurious emissions and responses, such as high-tension line leakage. Impacts from EMI also include the masking of radar targets and interference in communications. As the civil sector need for bandwidth increases, EMI will become an increasingly important concern. It is important the installation frequency manager be involved in the review of all projects that have the potential for EMI.

**2.7. Areas of Critical Concern Beyond the AICUZ Footprint.** The AFEM program has identified areas of additional land use compatibility concerns beyond the traditional AICUZ footprint pursuant to the encroachment challenge areas defined in AFI 90-2001, *Encroachment Management*. AFI 32-7063 identifies the possibility of needing to define Line of Sight/Look Angle Zones to protect the viability of radar/radio relay sites, telemetry equipment, radio antennas, etc. This provision also leaves open the ability to identify other areas of concern, especially as a consultation zone. If an installation feels that, they have a unique mission compatibility issue that is critical enough to require a separate compatibility zone, contact the AFCEC AICUZ Program Manager who will elevate the issue with the appropriate MAJCOM EMT and the AF/A4CPI AICUZ Program Manager.

**2.8. Land Use Compatibility Guidelines.** The AICUZ composite footprint for an air installation—the combination of noise contours, Clear Zones, APZs and the HAFZ—defines the minimum acceptable area in which land use control measures are recommended to protect the public's health, safety, and welfare and sustain the Air Force flying mission. Local governments ultimately decide controls over land use and development in areas neighboring air installations; accordingly, through the AICUZ Program, local governments are encouraged to plan for and promote compatible development.

2.8.1. In 1980, the Federal Interagency Committee on Noise (FICON) published *Guidelines for Considering Noise in Land Use Planning and Control*. The purpose of these guidelines is to encourage the best land use, consistent with community planning objectives, while minimizing exposure to excessive noise levels. These guidelines have evolved for military airfields through the DoDI 4165.57, *Air Installations Compatible Use Zones (AICUZ)*, and further adjusted through the individual Services. Air Force AICUZ land use compatibility guidelines for Clear Zones, APZs, and aircraft noise zones may be found in AFI 32-7063 (Attachments 2 and 3). See Tables A3.2 and A3.3 of this handbook for land use compatibility guidelines for noise zones from small arms, large caliber munitions and explosives. AFI 32-7063, sections 3.8 through 3.13 provide additional guidance on land use compatibility.

2.8.2. The land use recommendations in these tables are based on the Federal Highway Administration's *Standard Land Use Coding Manual (SLUCM)*. The SLUCM standards, including their codes and sub-codes, provide planners with detailed information describing specific land use categories. The Air Force has integrated additional land uses that did not



2.8.3. To ensure accurate review of land use plans, zoning ordinances or development proposals, it is critical that the AICUZ PM is aware which land use classification/coding system a local government uses: SLUCM or the Land Based Classification System (LBCS). Today, many communities rely on the LBCS, so the AICUZ PM may need to cross-walk local land use classifications with the two-digit SLUCM codes used in the AICUZ land use recommendation tables to make it easier to identify potentially incompatible land uses. Additionally, AICUZ PMs should be familiar with the more detailed three- and four-digit SLUCM breakout to get a better understanding of the full range of land use activities that fall under the broader two digit categories used in the AICUZ tables. Copies of the SLUCM and LBCS, including a cross-walk of the two coding systems, may be found at the AFEM SharePoint® site under the AICUZ Program Toolbox tab at <https://portal.afcec.hedc.af.mil/CP/PPP/CPPR/SitePages/Home.aspx>.

**2.10. Clear Zone Land Use Compatibility .** The Clear Zone is the area that has the greatest risk of accidents after the runway itself based on analysis of historic aircraft accident locations near military airfields. Because of this high risk, the Clear Zone warrants special attention. The potential for accidents is so high that land use restrictions necessary to ensure compatibility can prohibit an otherwise reasonable economic use of the land. Therefore, it is DoD and AF policy to own the land within the Clear Zone or control the land through restrictive use easements.

2.11.1. The accident potential in APZ I is less than the Clear Zone but APZ I still poses a significant risk factor. This area has land use compatibility guidelines that are sufficiently



flexible to allow reasonable economic use of the land, such as industrial/manufacturing, transportation, communication/utilities, wholesale trade, open space, recreation, and agriculture. However, uses that generate high concentrations of people in small areas are not appropriate.

2.11.2. The accident potential in APZ II is less than APZ I but APZ II still possesses a significant potential for accidents. Within APZ II, acceptable uses include those compatible within APZ I, as well as low-density single family residential, personal and business services, and commercial/retail trade uses of low intensity or low scale of operation. High-density functions such as multi-story buildings, places of assembly (theaters, churches, schools, restaurants, etc.), and high-density office uses are not considered compatible.

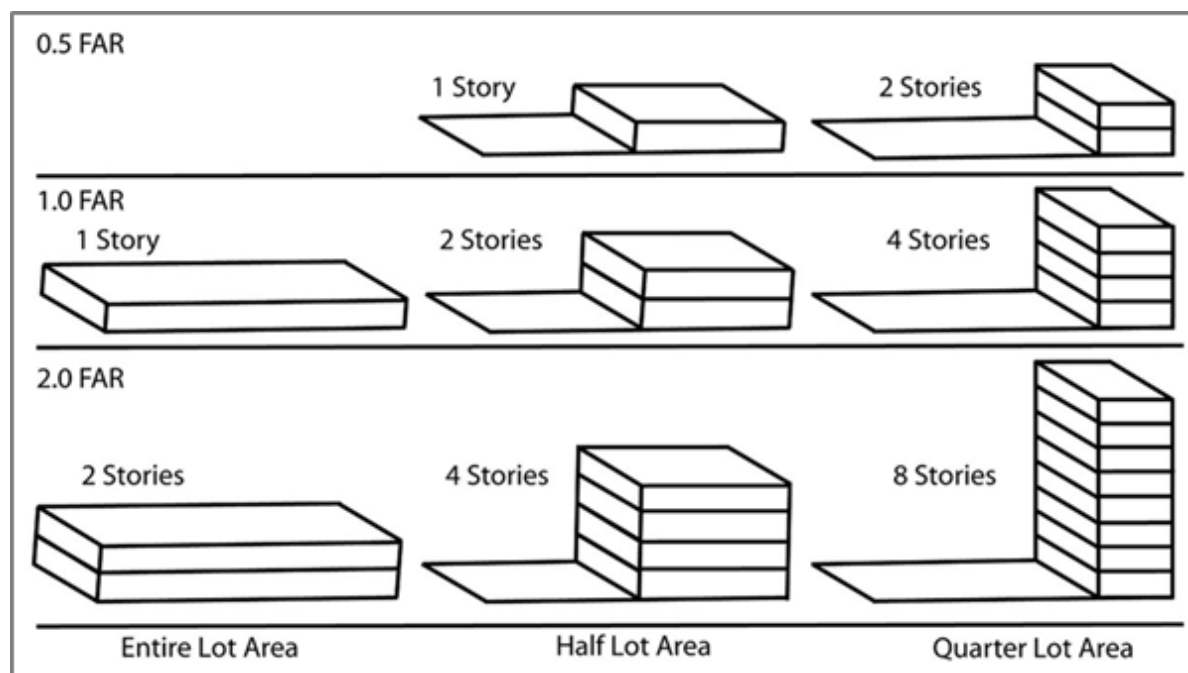
2.11.3. Floor Area Ratio (FAR) is used as a guide to density in some land use classifications within the APZs. Many communities use FAR to limit the intensity or scale of a use, particularly non-residential uses with the potential to conflict with surrounding residential or less intense uses already in existence. Early DoD policy recommended that density for non-residential land uses in APZ I be based on not more than 25 persons per acre and in APZ II not more than 50 persons per acre. However, land development can occur on multiple properties and in phases over time, making efforts to control development solely based on density hard to enforce. Consequently, DoD conducted studies using required parking spaces to determine appropriate FARs to achieve the not more than 25 and 50 persons per acre in APZs I and II, respectively.

2.11.3.1. Parking requirements can be based on number of employees, building floor area, type of use or other factors. AFI 32-7063 ties FARs to standard parking generation rates for various land uses, vehicle occupancy rates, and desired people intensity in the APZs I and II. For APZ I, the formula is  $FAR = 25 \text{ people an acre} / (\text{Average Vehicle Occupancy} \times \text{Average Parking Rate} \times (43560/1000))$ . The formula for APZ II is  $FAR = 50 / (\text{Average Vehicle Occupancy} \times \text{Average Parking Rate} \times (43560/1000))$ , resulting in FARs ranging from .11 to .56, depending on the APZ and the land use.

2.11.3.2. See figure 2.3 for an example of how FARs work. For determining the FAR for land use compatibility, the FAR equals the total floor area of a building in square feet divided by the total lot size in square feet. For example, a two-story building has 5,000 square feet of floor on each level, totaling 10,000 square feet of floor. The lot is 20,000 square feet. Thus,

$$\frac{10,000 \text{ ft}^2}{20,000 \text{ ft}^2} = 0.5 \text{ FAR}$$

If the building had only one story with 5,000 ft<sup>2</sup> and the lot was 20,000 ft<sup>2</sup>, the FAR would be 0.25.

**Figure 2.3. Calculating Floor Area Ratios (FARs).**

**2.12. Land Use Compatibility for Aircraft Noise** e. Long-term land use compatibility with noise resulting from the operation of military aircraft should minimize the effects on people, animals (domestic and wild), and structures on or in proximity to the installation. Nearly all studies on residential aircraft noise compatibility recommend no residential uses in noise zones above 75 dB DNL. Generally, most land uses exposed to noise levels below 65 dB DNL are considered compatible with airfield operations. The area between 65-75 dB DNL noise contours may not qualify for Federal mortgage insurance in residential categories according to HUD Regulation 24 CFR Part 51, Environmental Criteria and Standards, Part B Noise Abatement and Control. In many cases, HUD approval requires noise attenuation measures, the Regional Administrator's concurrence, and an Environmental Impact Statement. The Department of Veterans Affairs (VA) also has airfield noise and accident APZ restrictions that apply to its home loan guarantee program. Whenever possible, residential land use should be located below 65 dB DNL. Many communities near military air installations are aware of Federal Home financing programs that have limitations or guidelines against financing loans for homes in high noise areas and advise local citizens seeking to develop property.

2.12.1. Although AFI 32-7063 Table A3.1 states that residential land uses can be made compatible by adding adequate noise attenuation to reduce the interior noise level to 45 dB DNL with the windows closed, the exterior noise levels cannot be reduced. DoD and Air Force guidelines recommend that local communities determine whether their need for housing cannot otherwise be met before allowing residential development in high noise zones.

2.12.2. Noise Level Reduction (NLR). The numbers 25, 30, or 35 refer to noise level reduction (NLR) levels. NLR (outdoor to indoor) is achieved through the incorporation of noise attenuation into the design and construction of a structure. Land use and related structures are generally compatible in certain noise zones above 65 dB DNL/CNEL; however, measures to achieve NLR of 25, 30, or 35 (depending on the noise zone) must be

**2.13. Energy Related Land Uses.** Because of the changing needs of military test and training, the broad array of energy related land uses, and the continual emergence of new energy technologies, there are no pre-defined or generic “energy development zones” for airfields nor is there a definitive yes/no answer when it comes to energy compatibility. Typically, land use plans and zoning maps do not identify energy-related land, so AICUZ PMs and others involved in encroachment management need to be actively watching for these kinds of development proposals.

2.13.1. Land uses related to energy development, including support infrastructure, fall under a range of SLUCM codes. See AICUZ AFI 32-7063, Section 3.12 for more details.

2.13.2. Typically, utility related land uses may not be identified on a local land use map; AICUZ PMs may learn about local incentives to attract renewable energy development to the area or local or state permits for energy development. Like any other type of land development proposal, evaluate proposed energy projects for mission compatibility issues. There are no specific land use compatibility criteria for energy related land uses outside the APZs; however, energy projects proposed within the HAFZ can be evaluated using the potential effects identified in sections 2.6 and 2.8 of this handbook as a starting point.

2.13.3. The following three factors must be considered when evaluating the compatibility or potential for mission impacts of proposed energy development or transmission line projects: The technology (solar, wind, geo-thermal, and biomass), the location of the proposed development and the mission requirements. Consider the following mission compatibility concerns for various types of energy projects when evaluating the compatibility of a proposed development:

2.13.3.1. Wind turbine projects will be evaluated for possible radar interference to airfield and weather radar, long-range radar, aircraft-borne radar, and for hazards to flight;

2.13.3.2. Geothermal projects should be evaluated to determine whether the height of the steam towers would create hazards to flight, and if the steam could create visual interference. Depending on the type of geothermal technology and location of the plant, evaluate the potential for ice fog;

2.13.3.3. Solar energy technologies such as photo voltaic (PV) panel arrays or concentrating solar power, which use reflective materials like mirrors and lenses to concentrate sunlight to generate thermal energy, need to be evaluated for glint and glare issues for pilots and/or the air traffic control tower. Some solar facilities have the potential to create thermal updrafts and this possibility should be evaluated. However, such updrafts will typically dissipate at distances beyond 50 feet, so standard separation distances between aircraft and objects on the ground may mitigate this concern;

2.13.3.4. Evaluate biomass power generating plant designs and locations to determine if the emissions stacks will create an obstruction. Assess whether or not the emissions (dust/smoke/steam) will obscure pilot or ATC vision; and whether the design of the biomass feedstock storage area could attract birds, wildlife or their prey and therefore contribute to increased potential for BASH;

2.13.3.5. All electricity producing energy projects (conventional as well as clean) also include transmission lines. The project evaluation should also evaluate the compatibility of any new above ground transmission lines that would be required to connect the source to the electrical grid. AFI 32-7063, Table A2.1 includes compatibility criteria for transmission lines in the APZs;

2.13.3.6. Installations can engage with energy developers if they find out about proposed energy development projects that may have the potential to impact their mission; however, there are limits to what installation personnel can tell the developer. Should installation personnel find out about a proposed energy development prior to it coming through the OSD Clearinghouse process, it is highly recommended that the issue be

elevated to the MAJCOM EMT lead for further guidance. The DoD Siting Clearinghouse of the Office of the Deputy Undersecretary of Defense, Installations and Environment, coordinates the DoD assessment of all renewable energy projects to prevent or mitigate adverse impacts on military operations, in accordance with 32 CFR, Part 211. See AFI 13-201, Attachment 15, for additional information.

**2.14. Conclusion.** The overall goal of the Air Force AICUZ program is to protect the health, safety, and welfare of our neighbors while preserving our defense missions. We seek to achieve these goals by promoting compatible development. **Chapter 3** discusses preparing the AICUZ Study.

## CHAPTER 3

### PREPARING AN AICUZ STUDY

**3.1. Introduction.** This chapter discusses in detail the five phases for preparing an AICUZ study, shown in Table 3.1. The preparation of AICUZ amendments is not applicable until Phases IV and V.

**Table 3.1. 5 Phases for Preparing an AICUZ Study.**

|           |  |
|-----------|--|
| Phase I   | Data Collection                                |
| Phase II  | Operational Data Review and Validation         |
| Phase III | Development of Noise Contour Map               |
| Phase IV  | Preparing an AICUZ Study                       |
| Phase V   | Public Release of the AICUZ Study or Amendment |

3.1.1. Implementation of the AICUZ program is ongoing process. Nearly all air installations have completed and released AICUZ studies, although some installations may be exempt (see Section 4.2). Installation Commanders are responsible for ensuring that each air installation has an active AICUZ program. The Base Civil Engineer normally appoints the AICUZ PM, although the program may fall under another organization. Duties of the AICUZ PM include preparing and releasing updated AICUZ studies, data validation and program implementation (these duties are discussed in detail in Section 6).

3.1.2. An accurate AICUZ study requires the full support and participation of all installation functions including Installation/Wing leadership, Civil Engineering, AICUZ PM, Bioenvironmental Engineering, Legal, Public Affairs (PA), Base Operations, the flying wings, Air Traffic Control, Aircraft Maintenance, Safety, Weather, Comptroller, tenant units, and other appropriate functional areas. Support and participation by each functional area are particularly important during the data collection and analysis phase but should occur throughout the entire AICUZ process. See [chapter 2](#) of AFI 32-7063 for more details on these shared roles and shared responsibilities.

**3.2. Phase I: Data Collection.** A successful AICUZ program is built on accurate information. There are two types of data gathered at this stage: Operational data and local land use information. The operational data comes from aircraft flying and maintenance units. The collection team will also interview units that conduct ground testing and training activities, if applicable. The team will then focus outside the fence for information on existing and future local land use and development data, such as comprehensive plans, zoning regulations, economic development goals, population changes, master plans and planned developments, capital improvement projects, etc.

3.2.1. In most instances, the data gathering and preparation of the AICUZ will be performed by an Architect/Engineer (A/E) firm under contract to the Air Force – this section will cover responsibilities of the base, MAJCOM AFCEC, and the contractor and the preparation steps required when the data collection is contracted out. All contact with the A/E should be through the Contracting Officer Representative (COR) unless otherwise specified by the COR. If the AICUZ study is contracted through AFCEC, AFCEC/CP will appoint the COR.

3.2.2. A post-award telephonic pre-kick-off meeting with the A/E contractors, installation representatives, MAJCOM representatives, and AFCEC/CP personnel should immediately follow acquisition's Notice to Proceed. This meeting allows all the players to review the project statement of work and ensure mutual understanding of the work, the schedule, and the deliverables.

3.2.2.2. Among the Government-provided material is the Operational Data Gathering Handbook that describes the information required during the data gathering phase. The Handbook will help the installation's Point of Contact (POC) to determine the staff required during data gathering and allow the POC to start filling in the basic information. The AICUZ Data Collection Handbook is available at the AFCEC/CP Regional Development SharePoint® site under the AICUZ Toolbox tab at <https://portal.afcec.hedc.af.mil/CP/CPP/CPPR/SitePages/Home.aspx>.

3.2.4. The data gathering week begins with an on-site kickoff meeting. To ensure situational awareness and secure project support, brief both the Installation/Wing leadership and the IEMT prior to the AICUZ kickoff.

3.2.6. Most data gathering interviews take less than an hour. Use these interviews to build on the data gathered after the initial telephonic pre-kickoff meeting. Limit the number of operators/support personnel in each interview session. This encourages individual participation and perspective, discouraging “group think” and information by consensus. If

you have several operators in the same interview period, having someone in their leadership chain present will help ensure all interviewees participate.

3.2.7. All affected land use planning authorities should be included in the data review including local communities, counties, regional planning organizations, and councils of government (COG). If the community has already established a JLUS, be sure to interview someone of authority from the JLUS committee. For the meetings with off-base stakeholders, always have a representative from the base present (usually the AICUZ PM and possibly a public affairs specialist). Information gathered during this phase includes current and future land use plans, zoning information, community populations, and necessary GIS layers. Interviews also include discussions of any airport or military overlays, if applicable.

3.2.8. To keep the project on schedule it is important that wing and base leadership stay involved in the process. Normally, the data collection team, through the AICUZ PM, schedules an out brief with wing/base leadership for the end of the week. At that time, with concurrence from leadership, the data collection team establishes deadlines for any outstanding data gaps.

**3.3. Phase II: Data Review and Validation.** The AICUZ program, like any successful activity, is dependent on the quality, accuracy, and completeness of its data inputs. The AICUZ program requires a comprehensive review and validation process because recommendations based on the data may eventually be incorporated into local land use regulations or ordinances. There is also the possibility the data could be challenged in litigation. Phase II provides the quality assurance the AICUZ program requires.

3.3.1. During Phase II, the contractor and base, along with the MAJCOM and AFCEC/CP personnel, review the Phase I data package for adequacy. Data packages will vary from base to base. A comprehensive review helps to identify and correct deficiencies before the public release. Some portions of the program require the AICUZ PM to exercise a significant degree of judgment, particularly when it comes to analyzing land use compatibility. This is especially true where installations experience extreme development pressure or where multiple jurisdictions control land use. There is no “one size fits all” approach to assessing or evaluating data. Local conditions vary from one place to another, generating unique circumstances for each installation and its surrounding community. In addition to determining the content and quality of Phase I data, Phase II offers the opportunity to identify instances where assistance is required to close data gaps. Errors or omissions in Phase I can easily compromise subsequent phases.

3.3.2. There are five basic steps in Phase II:

3.3.2.1. Determine if all elements of Phase I have been completed. After the data gathering trip, the COR should set up a meeting (online, conference call or in person) between the COR, A/E, AICUZ PM, MAJCOM, and AFCEC/CP to identify any data gaps where information is still pending and then proceed through the AICUZ PM to contact those units’ individuals responsible for the missing data.

3.3.2.2. Ensure flight and maintenance data and the non-aviation operational elements are accurate.

3.3.2.3. Review the non-operational land use elements in detail. Check the data for accuracy. When required, the COR will request further information from the appropriate internal and external stakeholders.



3.3.2.5. Finally, review results of the corrected data package to ensure they are accurate and return the data package to the A/E to begin analysis.

3.3.4. To validate the land use data gathered from local governments, the applicable portions of the data package should be brought to the appropriate land use authorities by the AICUZ PM. Off-base stakeholders should review only those parts of the package to which they contributed. Remember, all conclusions and noise contours remain draft and are official use only until the updated AICUZ study is approved.

3.4.1. The noise contour maps are developed either by an A/E contractor or AFCEC/CP AICUZ staff and initially focus on current operations. A technical review of the noise contours is carried out by the COR, base, MAJCOM, and AFCEC/CP AICUZ staff. If any concerns are identified, the COR will set up a meeting of the stakeholders to resolve the concern.

**3.5. Phase IV: Preparation of AICUZ Study.** At this stage, all the collected data have been reviewed; noise contours and the Noise Model Operational Data Documentation (NMODD) prepared and validated; and, the A/E has been given approval for preparation of the AICUZ study and its associated products.

3.5.1.1. The audience for the AICUZ study consists of the public, land planning agencies, and elected officials. The AICUZ study gives an overview of the AICUZ at a particular installation to include noise contours, APZs, HAFZ, off-base land use analysis, and recommendations for achieving compatible development. Additionally, the study will give an overview of the base history, mission, and economic impact. The study should be written for a layperson with little knowledge of the base mission or AICUZ. An AICUZ study template is available at the AFCEC/CP Regional Development SharePoint® site under the AICUZ Program Toolbox tab at <https://portal.afcec.hedc.af.mil/CP/CPP/CPPR/SitePages/Home.aspx>.

3.5.1.2. The NMODD is a compilation of the aircraft operational data used for the noise modeling. It contains points of contacts for the providers of information, all assumptions, spreadsheets used to calculate daily operations, aircraft configurations (i.e., flight profiles) for aircraft operations in the airfield and SUA/ASU, as well as information on engine runs and munitions usage for ranges. For models using BASEOPS, this information can be generated from the report module. See AFI 32-7070 for more information on the NMODD.

3.5.1.3. The AICUZ map brochure is the size of a foldable highway travel map and briefly covers the topics in the AICUZ study. It provides a detailed street map of the base environs and shows the composite AICUZ map (noise zones, APZs and HAFZ). The map often serves as a tool for real estate professionals to discuss AICUZ with their buyers and sellers.

3.5.1.4. The AICUZ public brochure covers the topics of the AICUZ map brochure in a condensed version with a small scale composite AICUZ map. Normally the size of a sheet of legal-sized paper, it is tri-folded to create six columns for text and maps and to fit in a #10 envelope. The AICUZ public brochure is of a size easily mailed or distributed at meetings.

3.5.1.5. The AICUZ poster station deliverables usually consist of five large posters that can be displayed on easels for AICUZ public release:

3.5.1.5.1. Poster 1 addresses the Base mission, history and economic impact;

3.5.1.5.2. Poster 2 discusses flight operations at the installation, to include flight track overlays and based aircraft flight frequency;

3.5.1.5.3. Poster 3 will be an overview of the noise safety zones, APZs, height and obstruction criteria, and compatible land use recommendations;

3.5.1.5.4. Poster 4 is a map of the previous approved AICUZ noise contour overlaid with the new AICUZ noise contour on a community map showing existing zoning. The noise contours will show gradational shading down to 50 dB DNL/CNEL; and

3.5.1.5.5. Poster 5 will address the roles and responsibilities for Air Force, local governments, real estate professionals, developers, and public involvement.

3.5.1.6. If there are additional topics that should be discussed (such as ground weapons noise, weapons danger zones or an auxiliary field), a sixth poster station may be added. For meetings where aircraft noise may prove of high interest, a second poster 4 should be prepared and displayed.

3.5.1.7. These laminated posters shall be mounted on foam board and any maps shall be presented at a large enough scale for the public to locate their property in reference to the noise contours, APZs and flight paths.

3.5.2. The COR for the AICUZ task order will normally schedule two reviews of the draft AICUZ (at 50% and 90%). The NMODD will be used during air operations validation. Normally, the implementation tools (AICUZ map brochure, public brochure, and poster station deliverables) undergo their 50% review later as they must be based on the reconciled AICUZ 50% review. The 90% review addresses all AICUZ products.

3.5.3. The reviews will be accomplished by the COR, base, MAJCOM, and AFCEC/CP staff. After each review, staff comments will be reconciled with the A/E.

3.5.4. AICUZ Study Amendments. Up to this point, the preparation process has applied only to situations that require significant revisions to AICUZ studies. When the changes are few and minor in nature, the change requires little explanation, or if no controversy exists, amendments to AICUZ studies may be prepared.

3.5.4.1. Amendment typically consists of corrected pages, labeling of maps, etc. The approval process for AICUZ amendments begins with preparation of the draft submittal package. The package consists of any corrected pages and draft of the transmittal letter to the local communities.

3.5.4.2. If the installation AICUZ PM thinks they have a need to amend the AICUZ study, they should contact AFCEC/CP to discuss whether an AICUZ amendment would be advisable. If the consensus is to move forward, the AICUZ PM will work with AFCEC/CP to prepare the draft submittal package for IEMT coordination. If the IEMT concurs, they will forward the draft package to the MAJCOM EMT for their coordination. Any changes to the package will be coordinated with the AFCEC AICUZ PM. If there are no changes, the installation AICUZ PM will have the commander sign the transmittal letter and number. The installation will ensure that AFCEC/CP receives a copy of the final amendment package for its files.

**3.6. Phase V: Public Release of an AICUZ Study or Amendment.** Phase V places the AICUZ program into the public forum. During this phase, a coordinated team effort is imperative to ensure that the public, local governments and agencies who may be affected by the AICUZ are brought into the release process. At the same time, the release of an updated AICUZ study or amendment gives the air installation a chance to “kick start” the AICUZ program through the momentum provided by the public release. Increased community awareness opens opportunities to pursue new land use strategies that will benefit both the community and the air installation.

3.6.1. Public Release of the AICUZ Study Amendment. The public release of an amendment is primarily accomplished through public notification through newspapers and other media and through the distribution of the amendment in the same way an AICUZ study update is released (see section 3.6.5). Although public meetings on the amendment are not required, the base/wing leadership should consider such a meeting if they feel there is significant public interest. AFCEC/CP can provide assistance with organizing a public meeting.

3.6.2. Public Release of the AICUZ Study Update. The public release of an update includes public notification, distribution of the study and culminating in the Installation/Wing leadership releasing the AICUZ study in public release meeting. The members of the IEMT will assist Installation/Wing leadership in all phases of the public release, with the AICUZ PM, Public Affairs and Legal playing major roles.

3.6.3. Waiving the public release meeting. For unique cases, the MAJCOM EMT, on the recommendation of AFCEC/CP, may consider waiving the public meeting requirement. To receive a waiver, the installation commander must prepare and submit a waiver request along with full explanation and justification to MAJCOM EMT. If the EMT approves the waiver, the notification of the release of the update is still published in papers and other appropriate

media. The installation should simultaneously distribute copies of the study to all the same parties that normally would have received copies (Section 3.6.4) who would have been invited to the public meeting or who received a previous study, or would have received copies. Since AICUZ amendments do not require a public release meeting, a waiver is unnecessary.

3.6.4. Preparing for an AICUZ public release. The public release includes both distribution of the update or amendment as well as the public meeting. It is critical to coordinate all elements of the public release effort to meet a series of tight deadlines. Once the installation receives A/E AICUZ update deliverables, a firm release date can be scheduled and arrangements can be made for the venue for the AICUZ public meeting.

3.6.4.1. The first task is preparation of the AICUZ release notice for publication in the local newspapers and the media plan. Both should be coordinated through the IEMT, if applicable, noting all the deadlines that must be met for a successful AICUZ public release. Public notification about the AICUZ release should start 14 days prior to the public release meeting. Make use of broadcast, print and social media to get out the message.

3.6.4.2. External Distribution. The installation should simultaneously send copies of the AICUZ study or amendment to the applicable agencies, local governments, key organizations, State single points of contact and interested parties listed in Table 3.2, and Table 6.1 as well as to local libraries and individuals known to have an interest. AFCEC/CP will ensure copies of the AICUZ are sent to the appropriate regional HUD and VA offices for use in federally guaranteed loan programs. The general public may be provided with copies (hard or electronic) upon request.

3.6.4.2.1. HQ USAF/LLP distributes the update or amendment to the Congressional delegation in Washington, DC. The COR (i.e., AFCEC/CP, NGB, AFRC, etc.) provides copies of the AICUZ study and citizen's brochure/map, or amendment to HQ USAF/A4CIP at least 15 days prior to the public release of an updated study or the public notification of an amendment.

3.6.4.3. Internal Distribution. In addition to the public release activities, the AICUZ PM should distribute copies of the AICUZ study or amendment to Public Affairs, Legal Office, and Civil Engineering. Provide an enlarged copy of the AICUZ map to the Housing Management Office and base library for display in a conspicuous area to ensure Air Force personnel seeking off-base housing are aware of the noise or accident potential impacting adjacent land areas.

3.6.5. Public Release Meeting. Typically, the public release meeting is held off base to encourage maximum participation and avoid the perception of undue influence by the base. Carefully consider the location for the public release. A good or bad venue could set the tone for the entire meeting.

3.6.5.1. Timing. The timing of the meeting is important. Normally, the meetings run 3-4 hours, starting in late afternoon and going into early evening, to allow participants to attend after work. Tuesday and Thursday normally work best, with Thursdays preferred. Avoid Mondays, Fridays, holidays and holiday-shortened weeks as people tend to make other plans. Check to make sure there are no conflicting community meetings (i.e., City Council, Planning Commission, etc.) scheduled for the time of the release.

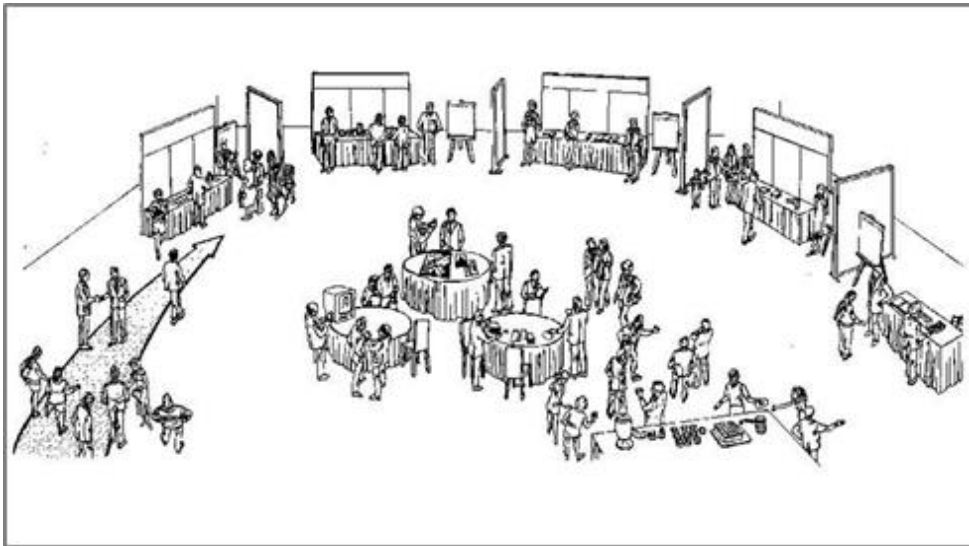
3.6.5.2. Audience. Make a list of agencies, organizations, elected officials, community leaders, local planners, and other key individuals who should be invited to the release meeting (see Table 3.2). Consultation with the MAJCOM and AFCEC/CP, and networking with other nearby air installations can help you identify stakeholders, anticipate questions, and develop your message.

**Table 3.2. Possible Invites to AICUZ Public Release Meeting.**

|                                |   |
|--------------------------------|---|
| Agencies                       | Regional Federal Housing Administration<br>Regional Department of Veterans Affairs<br>Other applicable State and Federal Agencies   |
| Local and Regional Governments | County Commissioners<br>City Council members<br>Planning Commissioners<br>Councils of Government leaders<br>Local State Representatives<br>U.S. and State elected officials<br>Key Staffers<br>Planning Directors<br>City, County and Regional Planners |
| Organizations                  | Real Estate professionals<br>Builders Organizations<br>Chambers of Commerce<br>Home Builders Associations   |
| Interest Groups                | General Public<br>Home owners' associations<br>Key land owners and developers<br>Veterans organizations   |

3.6.5.3. Format. The AICUZ public meeting is an information session normally held in an “Open House” format. Traditionally, government agencies have used “Town Hall” meetings to provide information to the public but it may also be perceived as “us against them” and may become adversarial. Town hall meetings limit the amount of information presented and public participation and interaction. The open house meeting is less formal and has no set presentations. Instead, it allows the public to interact one-on-one with various subject matter experts at poster stations and allows the public to access information at their own pace (see figure 3.1 for the layout of a typical open house meeting layout).

**Figure 3.1. Open House Format Meeting.**



3.6.6. Remember the following key points when it comes to the AICUZ open house:

3.6.6.1. Take advantage of the meeting to help stakeholders better understand the defense mission. Remember, the AICUZ release open house is both educational and informational.

3.6.6.2. When discussing the base mission, always include its place in the economy, i.e., number of employees, total economic impact, etc.;

3.6.6.3. In a situation of low trust and high concern by the public, keep messages simple and straight forward. Make no more than three main points, each backed up by three facts; and,

3.6.6.4. Respect stakeholders with differing viewpoints and look for areas of common ground.

3.6.7. AFCEC/CP will assist the base with planning and execution of the public release meeting. The AFCEC staff will typically arrive on base the day before the public meeting to be available to brief Installation/Wing leadership and provide training in AICUZ and risk communications for the installation staff who will be participating in the AICUZ public release.

## Chapter 4

### WHEN TO UPDATE OR AMEND AN AICUZ STUDY

**4.1. Introduction** . There is an art to knowing when to update an AICUZ study. Too long between updates and the community may lose confidence in the information and recommendations contained in an existing study. Too frequent updates may cause a community to lose confidence in its ability to make informed, long-term planning decisions beneficial to a base and its missions. While priorities within local communities may change with respect to land use and property rights, the procedures set forth within the AICUZ Program can provide future planning stability for both the community and the base. This chapter discusses AICUZ study maintenance, including when operational data should be reviewed and when an AICUZ study or update is or is not required. Operations will vary depending on missions, world events, and budgetary considerations. Installations will receive new airframes – will the new aircraft expand or contract the contours? Will changes in training tactics increase night operations or expand noise contours? Will a new departure affect a new noise sensitive area? These are the types of things that might drive an AICUZ update.

**4.2. AICUZ Exemptions.** As mentioned in section 3.1.1, not all installations require AICUZ studies. Before you decide whether an AICUZ amendment or update is needed, you need to know if the installation is exempt from preparing and releasing an AICUZ. Exemptions are provided for the following circumstances:

4.2.1. The installation's AICUZ footprint does not extend beyond the installation boundary. Review current mission and planning noise contours, as well as APZs, HAFZ and any identified areas of critical concern to determine the full geographical extent of the AICUZ footprint.

4.2.2. Noise zones may not extend off base if the installation has extensive acreage and the airfield is located well within the installation boundaries. At smaller installations, the noise zones will not typically extend outside the installation's boundaries if there are less than 10 jet or 25 propeller-driven aircraft operations or less than 250 helicopter operations on an average annual day.

4.2.3. The installation is located on a civilian owned and operated Airfield (See section 1.3 of AFI 32-7063 for more detail).

**4.3. Just because a base is exempt from preparing an AICUZ study and releasing it to surrounding communities doesn't mean the base cannot prepare a study.** Depending on local conditions and the base's relationship with the community, an AICUZ study could be the basis for a protective overlay zone or other development control that promotes land use compatibility or a collaborative Joint Land Use Study (JLUS). The local IEMT should consider these possible benefits of preparing an AICUZ in cases where a study is not required. Section 4.4 of AFI 32-7063 outlines the process for exempting an installation from preparing and releasing an AICUZ.

**4.4. Review of AICUZ Currency.** Having a published AICUZ or an AICUZ exemption does not permanently end an installation's AICUZ responsibilities. All installations must annually review the AICUZ Update Checklist to determine if an installation needs an AICUZ update. In addition to operational data that could affect noise zones, the checklist also covers operational

changes that could affect APZs, major changes in off-base land use and changes to AICUZ guidance (particularly on land use). During the annual review, the AICUZ PM examines the data to see if their study requires updating while installations with AICUZ study exemptions determine if the criteria used to establish the exemption remain valid. If an existing AICUZ study is outdated or the exemption criteria are no longer valid, the installation must initiate Phase I of a new study – AICUZ data collection. The AICUZ Update Checklist is available on the AFCEC/CP Regional Development SharePoint® site under the AICUZ Program Toolbox tab at <https://portal.afcec.hedc.af.mil/CP/PPP/CPPR/SitePages/Home.aspx>. Among the items covered by the checklist are the qualitative and quantitative processes for noise contours.

4.4.1. The Qualitative Noise Contour Screening Process. A cursory review of operational changes in the NMODD since the last AICUZ may reveal if an update to the AICUZ noise contours is warranted. Generally, the noise contours will not have changed enough if there have been no major changes to flight tracks near or overflight of noise sensitive areas; no changes in operational aircraft mix; a less than 25% increase or decrease in annual operations; or a less than 15% increase in night operations (from 10:00 PM to 7:00 AM). However, these changes may not necessarily mean that you need an update. If the increase or decrease is due to a temporary change (i.e. shifting operations to or from a base due to temporary runway closure, increase in training or readiness operations due overseas contingencies, temporary deployment of squadrons, etc.), examine the overall trend to see if the change is just an aberration. See AFI 32-7070, Attachment 4, for more information.

4.4.2. The Quantitative Noise Contour Screening Method. This method requires a full operational data collection and the generation of a noise contour and would normally be done if the qualitative screening process shows a possibility of a significant change in noise contours. The threshold for AICUZ updating actions is a change in Day-Night Average Sound Level (DNL) or Community Noise Equivalent Level (CNEL, California only) of 2 dB or more in a noise sensitive or controversial area identified in the last publicly released noise exposure map. The noise modeling computer program, NOISEMAP, can determine if the dB threshold has been exceeded at selected critical locations. AFCEC/CP can also assist the base with a complete analysis to determine if the installation needs to update their AICUZ.

**4.5. Relationship with EIAP Program** . There could be changes to noise contours that will drive an AICUZ study update because of a decision on a proposed action analyzed through the Air Force EIAP. Sometimes, a number of smaller operational changes may drive an update of the noise zones. While these changes may have qualified for categorical exclusions (CATEX), cumulatively, they may warrant updating the AICUZ study.



## CHAPTER 5

### AICUZ PROGRAM IMPLEMENTATION

**5.1. Introduction.** “We must train the way we fight” is more than a platitude. Today’s Air Force requires bases capable of day, night and all-weather operations that can accommodate next generation aircraft. It requires training areas with unencumbered airspace and the necessary bandwidth for joint operations, net-centric fighters and remotely piloted aircraft. Ranges that can handle standoff weapons and provide realistic threat training are also required. Where the needs of a modern Air Force and a growing community meet, there exists the possibility for friction and conflict – or opportunity. While a fence separates the base and community, what we do can impact our neighbors and what they do can impact our mission. The AICUZ Program provides an opportunity for collaboration where both the base and community can not only coexist but thrive.

5.1.1. That brings us to the Principles of Preservation of Military Bases:

5.1.1.1. Axiom I. Military bases do not operate in a vacuum but are subject to the influences of nearby political bodies. These bodies will follow the courses most expedient to their needs. Cities must look out for the needs of their citizens and ways to keep their growth healthy. At the same time, developers, landowners and special interest groups will use their influence with elected officials to achieve their own land use goals.

5.1.1.2. Axiom II. Changing the course of a political body in motion will sometimes create friction. The further a body deviates from the prescribed course, the greater the energy required to redirect that body. The first time you insert your installation’s interests into the planning process, it may cause friction. The military, however, has a right to an active role in the land use planning process. Over time, the installation’s interests and its role in the community will be recognized and you will be viewed as a legitimate stakeholder and accepted as part of the process.

5.1.1.3. Axiom III. Urban encroachment will slow when a political body assumes your course is most expedient to its needs.

5.1.2. Working mission compatibility issues requires a proactive effort. The sooner you enter the planning process on an issue the more open a developer is to changes in its proposal. Once the developer commits resources and money to the project, they will often fight any changes tooth and nail. An installation that works with the community and is an active member in the community will thrive.

**5.2. Terminology.** Before we get too far into the process, let’s define some key terms. Additional terms and acronyms are in Attachment 1.

5.2.1. According to the Meriam Webster dictionary, the term ‘encroachment’ means “to gradually take or begin to use or affect something that belongs to someone else or that someone else is using.” Remember – encroachment doesn’t mean the same to everyone. Perceptions of what encroachment is or is not can vary from community to community. We – the Air Force – must ensure communities understand what encroachment means to us and we must understand what encroachment means to them.

5.2.1.1. AFI 90-2001, *Encroachment Management*, defines encroachment as “any deliberate action by any governmental or non-governmental entity or individual that does, or is likely to, inhibit, curtail, or impede current or future military activities or deliberate military activity that is, or is likely to be, incompatible with the community’s use of its resources.” In simple terms, encroachment is what others do to us (DoD), what we do to others, and what we do to ourselves. Encroachment is a two-way street. While we may look at new housing in a high noise zone as an encroachment, it is very likely that people within the community who find their dream home in a noise zone that has expanded due to a mission realignment or new aircraft beddown may feel it is the Air Force doing the encroaching. Also note, we can create self-encroachment through Air Force or DoD activities that interfere with a military mission.

5.2.2. Installation Encroachment Management Team (IEMT). The IEMT serves as the base’s focal point for encroachment issues. It is a cross-functional decision-making team for long-term, collaborative planning and problem solving. The team will analyze issues, develop responses, monitor activities, coordinate with higher EMTs, and engage internal and external stakeholders.

5.2.2.1. The IEMT Executive Director acts as the installation lead for coordinating AFEM Program activities, reports to the installation commander, and serves as the primary advisor to leadership on encroachment challenges and proposed management strategies.

5.2.2.2. IEMT members are cross-functional and drawn from foundational programs already supporting encroachment management. Tenant and/or mission partner participation in the IEMT is important.

5.2.3. Installation Complex/Mission Footprint (IC/MF). The land, facilities, airspace, and ranges providing direct mission support compose the Installation Complex (IC) and are owned, managed or controlled by the installation.

5.2.3.1. Traditionally, we have focused on the area around the air installation when attempting to address encroachment challenges or concerns. While the airfield is of primary importance, most of the training mission is accomplished using military training routes, airspace training areas, and ranges that fall within the mission footprint. The encroachment challenges within the IC/MF, away from the airfield environs, are the normally the responsibility of the IEMT unless assigned to the AICUZ Program Manager.

5.2.3.2. Depending on an installation’s training requirements, owned or controlled assets may not adequately allow for completion of training requirements and the installation may need to use other assets. The MF is composed of the IC plus any land, facilities, airspace, and ranges which are not managed by the installation but which provide direct, routine support to the mission. For example, Bureau of Land Management (BLM) lands used for training would fall into the MF.

5.2.4. Region of Influence (ROI). The ROI is the geopolitical area the installation operates within, including both the base and other assets, such as airspace and training areas. This may include communities and agency-controlled lands at any government level. The ROI Priority Area is a geographic area where critical mission operations take place or stakeholder

actions incompatible with mission operations are more likely. It defines priority areas for encroachment concerns and also helps prioritize key stakeholders.

**5.3. Understanding the Ground Rules.** Many of the ground rules for working with communities are based in the law – the law defines what installations can and cannot do in everyday interaction with the public (see Table 5.1). Whenever you have any concerns as to what you legally can or cannot do, ask your Legal Office which has reach-back to AFLOA/JACE for specialized support.

**Table 5.1. Engaging State and Local Governments (The Facts):**

| Common Issues   | True/False | What the Law Says  | What This Means  |
|---|------------|--|--|
| “DoD personnel cannot provide information to State and Local governments about legislation that would protect our military bases and ranges.” | FALSE      | 1. “No part of the money appropriation ...shall be used directly or indirectly to...influence a Member of Congress, a jurisdiction, or official of any government, to favor...or oppose any law , policy or appropriation.” [18 U.S.C. 1913] | <b>IT IS OKAY TO:</b> <ol style="list-style-type: none"> <li>1. Share information about Administration positions</li> <li>2. Share information necessary to the administration of laws for which a government agency is responsible</li> <li>3. Provide pre-existing materials</li> <li>4. Give speeches or testimony on Administration positions (as long as not exhorting the public to contact government officials in support of position)</li> <li>5. Send letters from Agency to members of Congress</li> <li>6. Make statements to news media on Administration positions</li> </ol><br><b>IT IS NOT OKAY TO:</b> <p>Use appropriated funds to generate “grass roots” support, i.e., attempt to mobilize citizens or networks to call, write, email, or otherwise contact lawmakers in support of DoD initiatives</p> |
| “Providing information on impacts of local development action on our installation is lobbying.”   | FALSE      | 2. Applicable to lobbying at the State and Local level AND with regard to regulations and policy, not just legislation and appropriations.   |  |
| “Giving speeches or testimony on legislation is considered lobbying.”   | DEPENDS    | 3. No part of any appropriations contained in this Act shall be used for publicity or propaganda purposes... [DoD FY05 Appropriations Act]   |  |
| “If State and Local governments take the military’s advice, the military may become liable for takings.”                                      | FALSE      | Nor shall private property be taken for public use, without just compensation.” [U.S. Constitution, Amendment 5]   | <b>IT IS OKAY TO:</b> <ol style="list-style-type: none"> <li>1. Testify or provide information to governmental agencies about impacts of actions on military operations</li> <li>2. Make recommendations or otherwise be persuasive about impacts of actions</li> <li>3. Prepare and submit comments on</li> </ol>   |

| Common Issues  | True/False | What the Law Says   | What This Means  |
|--|------------|---|--|
| “Testifying to a local land use planning authority makes the government liable for takings.”   | FALSE      | “The United States may use its position as a landowner to influence local zoning authorities without incurring liability for a taking.”<br>[Persyn v. United States, 32 Fed. Ci. 579, 585 (1995)] | draft ordinances/legislation<br><br>IT IS NOT OKAY TO:<br>1. Be part of a panel that VOTES on land use matters<br>2. Threaten, deceive or recommend others do what we cannot do                            |
| “Working with State and Local governments to combat encroachment is DoD Policy”  | TRUE       | “I recommend you direct more active involvement at the installation and Regional Coordinator level in all aspects of State and Local planning that could impact readiness.”                       | IT IS OKAY TO:<br>• Participate, communicate, build relationships, and share information<br><br>IT IS NOT OKAY TO:<br>• Avoid all interactions with local planners and organizations about land use issues |
| Modified from “ <i>Working with State and Local Governments to Combat Encroachment</i> ,” Memo from Deputy Under Secretary of Defense (Installations and Environment), 23 August 2004. |            |   |  |

## GETTING ORGANIZED

6.1.2.3. The AICUZ PM can learn about topics, such as installation master planning or the National Environmental Policy Act (NEPA), through the Air Force Institute of Technology (AFIT). Risk Communications and NEPA courses are also offered through

6.1.2.4. Public speaking and working with the public outreach team are essential skills for the AICUZ PM. If you feel uncomfortable talking before an audience, take a course in public speaking at a local community college and join an organization that offers public speaking opportunities. AFH 33-337, *The Tongue and Quill* (19 November 2015), is a very good resource for learning basic communications skills. Working with the public is an acquired skill, developed by experience but there are resources available to help with this task. Help in this area is often available through your PA office and with environmental personnel, both of which should have experience in this area. The FAA's *Community Involvement Manual* (February 2016) provides a good overview and is available on the AFCEC/CP Regional Development SharePoint® site in the Outreach and Engagement folder under the AICUZ Program Toolbox tab at <https://portal.afcec.hedc.af.mil/CP/CP/PPR/SitePages/Home.aspx>. Assistance and guidance is also available from the AICUZ and encroachment management planners at AFCEC/CP.

6.1.2.5. The military's operational side is often a mystery to people without military service experience. The AICUZ PM should spend time visiting with flying units, attending their open houses and air shows. In addition, the AICUZ PM should learn about the installation's assigned aircraft, flying missions and the type of air operations performed at the base. Attend Airfield Operations Board meetings; build interpersonal relationships with Airfield Ops staff; regularly visit the Airspace Manager and Standardization/Evaluation offices and ask operational units for mission briefings. Consider enrolling in Air Force Professional Military Education and join the Air Force Association. Take advantage of the Base Library for military professional reading lists. Visit the air traffic control tower and have TERPS explain your base's published departures, arrivals and flight publications. Learning the "language" and terms unique to the operators and understanding their culture will build trust and credibility with them.

6.1.3.1. AFCEC/CP publishes a bi-weekly compilation of worldwide AICUZ and encroachment-related articles to provide a glimpse of public and media perceptions of AICUZ and encroachment. Additionally, CP publishes the biannual AFEM Newsletter. The Newsletter provides the reader with case studies, lessons learned, frequently asked questions, and technical articles on AICUZ, encroachment and mission sustainability. Archived issues of the AICUZ and encroachment-related articles and the newsletter are under the Media Monitoring tab at the AFCEC/CP Regional Development SharePoint® site at <https://portal.afcec.hedc.af.mil/CP/CP/PPR/SitePages/Home.aspx>.

6.1.3.2. The Office of the Secretary of Defense (OSD) has sponsored a series of primers on planning, outreach and engagement that will assist the AICUZ PM in working with various governmental agencies. These primers include: Working with State Legislators; Working with Local Governments; Working to Preserve Farm, Forest and Ranch Lands; Commander's Guide to Community Involvement; Collaborative Land Use Planning; Working with Regional Councils; Outreach for Mission Sustainability; Working with Conservation Districts; A Practical Guide to Compatible Civilian Development near

6.2.4. Find out who are the key staffers and planners who advise the local government leadership on issues.

6.2.5. Become familiar with the municipal plans and learn how the local planning process operates. For instance, know which boards, commissions, and committees perform project review and approval. Identify opportunities for the base to enter into the planning process. For airports in your ROI, review any Part 150 studies and Airport Improvement Plans – these documents should show you how commercial and municipal airports approach encroachment. Finally, review your state statutes for military compatibility legislations.

**Table 6.1. Potential Agencies and Organizations Interested in AICUZ Information.**

| <b>Federal Government</b>            |   |     |   |
|--------------------------------------|---|-----|---|
| 1.                                   | Department of Agriculture   | 1.  | Housing & Urban Development   |
| 2.                                   | U.S. Forest Service   | 2.  | Environmental Protection Agency   |
| 3.                                   | Soil Conservation Service   | 3.  | Department of Education   |
| 4.                                   | Department of the Interior  | 4.  | Department of Commerce  |
| 5.                                   | Bureau of Land Management   | 5.  | Census Bureau   |
| 6.                                   | Fish and Wildlife Service   | 6.  | Department of Labor   |
| 7.                                   | National Park Service   | 7.  | Veterans Affairs  |
| 8.                                   | Advisory Council on Historic Preservation   | 8.  | Farmers Home Administration   |
| 9.                                   | Health & Human Services   | 9.  | Department of Energy  |
| 10.                                  | Department of Transportation  | 10. | Military (DoD, Navy/Marines, Army incl. COE)                                  |
| 11.                                  | Federal Aviation Administration   | 11. | Coast Guard   |
| 12.                                  | Federal Highway Administration  |     |   |
| <b>State Government</b>              |   |     |   |
| 1.                                   | Senators (local and key committees)   | 1.  | Agriculture   |
| 2.                                   | Representatives (local and key committees)  | 2.  | Emergency Response Agency   |
| 3.                                   | Planning Department   | 3.  | Transportation  |
| 4.                                   | Economic Department   | 4.  | EO 12372 Single Point of Contact  |
| 5.                                   | Employment Department   | 5.  | Aeronautics Department  |
| 6.                                   | Highway Department  | 6.  | State Historic Preservation Office  |
| 7.                                   | Recreation Department   | 7.  | Conservation Department   |
| 8.                                   | Natural Resources   | 8.  | Coastal Agency  |
| 9.                                   | Fish and Wildlife   | 9.  | Solid Waste Department  |
| 10.                                  | Land Department   | 10. | Environmental Agency  |
| 11.                                  | Water Resources   | 11. | Health Agency   |
| 12.                                  | Air Quality   | 12. | Military Affairs, if applicable   |
| 13.                                  | National Guard  |     |   |
| <b>Local and Regional Government</b> |   |     |   |
| 1.                                   | County & Municipal Departments (Planning, Development, Real Estate, etc.)   | 3.  | Fire Districts  |
| 1.                                   | County & Municipal bodies (County Commissions, City Councils, Planning Commissions, Planning & Zoning Boards, etc.) | 4.  | Emergency Response Agencies   |
| 2.                                   | Councils of Government  | 5.  | School Boards   |
|                                      |   | 6.  | Districts (Water, Soil Conservation, Flood Control, Sewer, Solid Waste, etc.) |
|                                      |   | 7.  | EO 12372 Designated Agencies  |



| Special Interest Groups   |   |
|---|---|
| 1. Service Organizations (Lions, Kiwanis, etc.)   | 10. Local Chapters of Professional Organizations (e.g., AIA, ASCE, APA) |
| 2. Military-related Organizations (Air Force Association, American Legion, VFW, etc.)                 | 1. Bar Association  |
| 3. Chambers of Commerce   | 2. Newspapers   |
| 4. Board of Real Estate   | 3. Radio & Television Stations  |
| 5. Real Estate Organizations (incl. local and state chapters of the National Association of Realtors) | 4. Industrial Councils  |
| 6. Real Estate Brokers Association  | 5. Council of Churches  |
| 7. Homebuilders Association   | 6. Key Landowners and Developers  |
| 8. Homeowners Associations  | 7. Unions   |
| 9. Environmental Groups   | 8. Retiree Organizations  |
|   | 9. Other Non-Governmental Organization                                  |

6.2.6. Obtain calendars and agendas for key meetings. This can be done by visiting a city or county website, as they have codified this practice as part of the notification process. Some communities allow you to sign up for alerts automatically sent to your email. Learn the procedures for submitting written comments and giving oral testimony. Times for submittal or even signing up to testify vary. If you don't submit comments in time, the Air Force viewpoint will not be heard.

6.2.7. While the AICUZ PM will spend considerable time working with local governments, make sure you've identified the various other organizations involved in the land use planning process. Real estate professionals, homebuilders' associations, NGOs and activists all have a role in these processes.

6.2.8. Identify the opinion leaders within the community. Opinion leaders are not necessarily elected officials – they are the ones the elected officials and citizens listen to as a voice of reason. Often they may be a retired general officer but could also be a business leader or community activist.

6.2.9. Finally, learn who in the community supports your base and its mission and those who have concerns.

## CHAPTER 7

### ENGAGEMENT

**7.1. Introduction.** At this point, it is time to share Air Force mission needs and concerns with the community and to work collaboratively on land use planning. The AICUZ PM is the linchpin of this effort, serving as a liaison and bringing two diverse cultures with differing perspectives – the military and the community – together on issues of land use compatibility. Remember that liaison goes both ways – it is just as important that installation leadership understands the community position on land use issues as it is that the community understand why the Air Force must train and fly.

**7.2. Attitude.** “Pardon my jet noise; it’s the sound of freedom.” For many years, this was a common sign outside the gate at military airfields. While some may agree with this sentiment, it may be perceived as a slap to those citizens living nearby. As noted earlier, what we do (on-base) can affect our neighbors and what they do (off-base) can affect our mission. Encroachment management is not about two parties facing down each other across a table. Encroachment management is a team effort where diverse interests work towards mutually acceptable decisions with mutually beneficial outcomes. We build our relationships and credibility with the community by being a good neighbor, participating and volunteering in local activities and events. We best engage advocacy groups when we understand their motivations and concerns. We keep the public informed when we temporarily extend our operations hours or flying tempo. We are responsive to queries and treat everyone with respect—we are professional. Less than two percent of the U.S. population has served in the military and their only contact with the Air Force may be when you respond to a question at a public meeting. At that time, you are representing the Air Force and you do not get a second chance to make a first impression.

**7.3. Proactive Engagement .** Encroachment management often requires a quick reaction to unfolding events to ensure the community hears the Air Force viewpoint. Axiom II of “The ‘Principles’ for Conservation of Military Bases” discussed in [Chapter 5](#) states: “The further a body deviates from the prescribed course, the greater the energy required to redirect that body.” To be truly proactive in the encroachment management process, the AICUZ PM must find an early entry point into the planning process. At that point, when developers are looking to move their project forward, they are most receptive to working with the military to resolve compatibility concerns. However, once developers have spent time and money on a project they will be less willing to compromise. Ideally, the AICUZ PM will participate in the early meetings between local planners and the developer. Not only are developers more willing to work with the Air Force at this stage, but early engagement also gives the installation time to formulate a response. Taking a proactive approach through early participation in the planning process reduces friction and increases the likelihood of a successful collaboration. This in turn leads to a solid relationship between the installation and the community.

**7.4. Internal Training/Education.** A proactive approach is just as important on base as it is off base. Developing relationships and regular communications with off-base stakeholders increases the chances of success. Developing and holding regular AICUZ and encroachment management training on base also increases your chances of success.

7.4.1. AICUZ and encroachment management training needs to start at the top with Installation/Wing leadership, emphasizing how compatible development helps to protect the defense missions.

7.4.2. As a foundational program to AFEM, basic training in AICUZ is essential for IEMT members to ensure they have an understanding of how compatible land use guidelines work with the encroachment challenges.

7.4.3. Education for the operational units is also essential. Educating the flying units on community concerns gives them an awareness of public concerns and why noise abatement techniques are essential.

7.4.4. Webinar recordings of AICUZ and AFEM seminars are available on AFCEC/CP Regional Development SharePoint® site under the Training tab. Additional AICUZ resources, including videos, are available under the AICUZ Program Toolbox tab at <https://portal.afcec.hedc.af.mil/CP/CP/PPR/SitePages/Home.aspx>. Two of the videos, *AICUZ: The Commander's Role* and *The AICUZ Program*, are particularly useful for giving an overview of the program and command responsibilities. Additionally, AFCEC/CP staff is available for assistance and mentoring.

**7.5. Boots on the Ground.** The AICUZ program cannot be implemented solely from behind a desk; it is important that the AICUZ PM go to the field.

7.5.1. Every day, read the local papers and review planning meeting announcements and legal notices to determine if any of the upcoming actions have the potential to affect your installation's defense missions. Visit local government websites for public meeting agendas. Sign up for automated alerts and invitations to public hearings. Check with your PA to ensure you are on the distribution list for media monitoring articles concerning your base.

7.5.2. At least weekly, get out of the office and drive your installation perimeter and the AICUZ footprint, looking for rezoning notices, large tracks of property for sale, freshly cleared land and other signs of potential development. Proposed utility expansions, such as sewers and waterlines, are also indicators of potential development. Look for new buildings, such as fire stations or police substations, as indicators of future population growth. Note buildings or large tracts of land for sale or available for development that could potentially harbor incompatible uses. Finally, watch existing development for changes in use that may be incompatible with the installation mission.

7.5.3. To successfully monitor and evaluate off-base land use development plans, installation personnel must establish and maintain contact with planning and other officials at appropriate municipal and county offices where land use issues are handled. Establish lines of communication with other applicable government agencies (councils of government, airport authorities, other military installations, utility districts, etc.) and area offices of federal and state agencies (State Airport Board, State Real Estate Commission, Office of Economic Planning and Development, HUD, VA, FHA, FAA, etc.). These agencies can influence proposed developments near air installations.

7.5.4. Like any other landowner, the Air Force has the right to express concern for planning and zoning issues. The Air Force needs representatives at these meetings to convey Air Force interests. Regularly attend and participate in appropriate zoning commission, city council, county board, and other meetings and hearings, which could potentially affect the installation. In order to obtain additional information on future development plans or changes

in use affecting the installation, attend and participate at meetings of local airport authorities, council of governments, utility districts, real estate associations, homebuilder associations, etc. Are elected and appointed officials discussing potential development issues not yet in the planning process? Does the public testimony include possible development issues or issues of concern about your base's missions?

7.5.5. When a possible encroachment challenge is identified, the IEMT's cross-functional approach can assist in the preparation of the installation's response to the appropriate decision-making authority. When needed, enlist additional support from the flying wings, base operations, etc. Remember too, that reach-back support is available from the AICUZ planners at AFCEC/CP. Maintain complete records of all AICUZ actions and enter those records in the IEMT's minutes.

7.5.6. Once a land use proposal has been determined as incompatible with the AICUZ guidelines, the installation must assess the impact and inform the appropriate agencies of its concerns. Be sure to coordinate with Legal and PA before stating any preliminary or official position or making a presentation at a public meeting.

7.5.6.1. Open and early discussions with the applicant will determine if modifications can be made to the proposal to avoid impacting the installation's operations. If a public hearing is held, the AICUZ PM should attend to voice specific concerns. If the decision-making body is a board or commission, such as a local planning board, members should be briefed prior to the hearing. Some boards hold executive sessions prior to a public hearing. If the process allows, present the installation's concerns both verbally and in written form. The installation should be prepared to provide information to the news media explaining the facts, reasons and key messages for not supporting the proposed development.

7.5.6.2. Presenting the installation's concerns is a team effort involving Installation/Wing leadership, the AICUZ PM, Public Affairs, Legal, and any necessary Subject Matter Experts (SMEs), such as the Airspace Manager, Frequency Spectrum Manager, Anti-Terrorism/Force Protection, etc. The team should determine who should speak, what information should be released, and to whom it should be directed. The installation should negotiate with the decision-making body to achieve a result protecting the vital interests of the installation.

**7.6. Networking.** Networking is a form of interaction regularly practiced by urban planners. Networking is an informal interaction and free flow of information that builds-effective relationships. It occurs at chance encounters or during down time at meetings. Because it is unstructured, networking may cover a wide range of topics, leading to serendipitous discoveries. Networking is one of the most productive means of communication. Take advantage of networking opportunities by meeting regularly with planning professionals, going out for coffee or even lunch. You will gain clearer insight into community issues while informally educating others on your installation's missions and concerns.

**7.7. Communication, Outreach and Engagement.** The ability to formulate and communicate complex thoughts sets humankind aside from the rest of the animal kingdom. Sometimes communication is succinct and to the point – other times it is not. In 1863, Edward Everett delivered a 13,607-word speech to dedicate a battlefield cemetery at a previously little known crossroads community in Pennsylvania. Known as the “finest orator in the country,” Everett's

two-hour oration was eclipsed by ten sentences – 271 words – delivered by President Abraham Lincoln in a speech known today as the *Gettysburg Address*. Few communicators are as skilled as President Lincoln. In our business, poor communication skills and unclear messaging can lead to misunderstandings, community discord and even affect our mission.

7.7.1. Communication is basically one-way or two-way. The one-way approach allows the sender to frame a specific message often on short notice but, by nature, this approach allows little distribution control and allows no direct feedback such as in press releases. These communications are normally prepared by PA, vetted through the base legal office, and approved by installation leadership.

7.7.2. Outreach is a limited two-way communication approach that is presentational in nature, typically conducted by Air Force personnel and crafted for a specific audience. The briefings are informational with stakeholder questions following the presentation. These presentations are generally prepared by the AICUZ PM with assistance from PA and, depending on the level of audience, conducted by either the AICUZ PM or Installation/Wing leadership. Build your outreach briefing off a stable of existing presentations and tailor it toward a specific issue and/or stakeholder. Section 6.1.6 of this handbook discusses the AICUZ brief.

7.7.3. Engagement is two-way communication and conversational, involving true dialogue between the Air Force and stakeholders. Because of its open and direct nature, engagement requires a high level of preparation, possibly involving Air Force SMEs and coordination with the legal and public affairs offices (see Table 7.1 for some basic rules of engagement). Direct engagement is beneficial to both the installation and stakeholders as it helps build a collaborative environment. There are many venues suitable for engagement on AICUZ issues – the following are just a few examples:

**Table 7.1. Rules of Engagement.**

| <b>Do:</b>   |   |
|--|---|
| 1. Treat all attendees with respect.   | 7. Stay on message.   |
| 2. Determine when Installation/Wing leadership should be involved in engagement and when it is appropriate for staff and the AICUZ PM.         | 8. Attend public meetings to raise awareness of installation issues and understand community concerns.  |
| 3. Utilize Air Force approved themes and messages to educate stakeholders about the role of the installation in the community.                 | 9. Ensure installation messages and communications are consistent with past language/interactions.      |
| 4. Identify stakeholders and establish relationships. Build on and sustain those relationships.  | 10. Reach back for SME support as appropriate.  |
| 5. Coordinate internally with tenant units and mission partners to fully understand all mission requirements and related encroachment impacts. | 11. Arrive early, leave late.   |
| 6. Learn to identify decision makers and opinion makers.   | 12. Answer all questions. If you don't know the answer, let them know you will get back to them and do. |
|  | 13. Provide concise answers. Upset people will hear what they expect to hear.                           |



**7.8. Special Stakeholders.** Table 4.1 presents a list of potential invitees to the AICUZ public release and Table 6.1 presents a list of potential agencies and organizations with an interest in AICUZ. There are, however, certain groups who should be included in your daily outreach including:

7.8.1. Elected and Appointed Officials. While much of the communication with elected officials will occur at the Installation/Wing leadership level, the AICUZ PM needs to stay involved to ensure the Air Force message on encroachment is seamless and consistent. One way to stay connected with elected officials is through their staff. Staff serve the elected officials by helping formulate positions and assist with constituent communications. The AICUZ PM should look for opportunities to network with staff and educate them directly. One venue for educating elected and appointed officials and their staff is through public workshops for city councils and planning commissions. These meetings are normally open to the public as a condition of Sunshine Laws, which generally prohibit a “quorum” (a numerical majority of an elected body) from meeting and discussing official business without public participation.

7.8.2. Planners. Local and regional government planners help formulate land use policy and advise elected officials on land use development. However, few planners have a general understanding of our national security mission or have direct experience with the AICUZ or AFEM programs. Opportunities exist for outreach and engagement, such as setting up AICUZ training directly with planning organizations or participating in national, chapter and section meetings and events held by professional planning organizations. If you are in a region with multiple bases, consider partnering in your outreach efforts or jointly hosting a planning section meeting with AICUZ/AFEM training that includes viewpoints and lessons learned from other bases/services. AICUZ PMs and community planners should become intimately familiar with and speak fluently about development codes and zoning ordinances of their neighboring jurisdictions. This is critical for constructive conversations about land use controls, districts, annexations, and local government strategies to implement protective measures supporting the flying mission.

7.8.3. Real Estate Professionals. Real estate professionals play an important role in ensuring potential buyers are aware of noise and other impacts from nearby military installations. While not all communities require fair disclosure of noise and other military impacts, real estate professionals still have a fiduciary responsibility to ensure their clients understand any potential issues that could affect their enjoyment of a new home. However, few real estate professionals have awareness of the military mission or AICUZ, leaving open the opportunity for training. Almost every Tuesday or Wednesday, real estate brokers hold training for agents and they are always looking for guest speakers. Local chapters of real estate organizations, such as the National Association of Realtors® (NAR), typically hold annual training workshops and often seek articles of interest for their respective newsletters and publications.

7.8.3.1. The AFCEC/CP Regional Development SharePoint® site contains a video designed to educate real estate professionals on AICUZ and the need for disclosure. This video is available at the AFCEC/CP Regional Development SharePoint® site under the AICUZ Program Toolbox tab at <https://portal.afcec.hedc.af.mil/CP/CPP/CPPR/SitePages/Home.aspx>. Additionally, AFCEC/CP staff is available for assistance on setting up training.

7.8.3.2. Real estate professionals also present a good opportunity for collaboration. Brokers subscribe to Multiple Listing Services (MLS) that allows them to access a list of homes for sale and the details of each property. The AICUZ PM should work with the real estate professionals to ensure that prospective buyers see noise zones and APZs for affected properties.

7.8.4. Developers. Like real estate professionals, developers have little understanding of the AICUZ program. However, through homebuilder associations, opportunities open up for training. Of particular interest is how incorporating noise level reduction into homes can increase the quality of life for those impacted by aircraft noise. See section 2.12.2 for further information for resources on sound insulation.

7.8.5. Media. At times, some may perceive the media as hostile – more likely, they are uninformed about the military with little experience in working with the armed services. Work with your PA to develop and release ‘good news’ stories about the base to educate the public, provide base tours, and develop ‘background’ briefs about the AICUZ and AFEM programs for the media. The concept of media has evolved. Today, anyone with a smart phone can be considered media. A smart phone thrust in your face at a public meeting can lead to a posting on YouTube<sup>®</sup>. Work with your PA on how to handle requests for impromptu interviews and where you can go for training.

7.8.6. The Public. Often the public’s concern over our operations could be as simple as late night operations keeping the baby awake. The AICUZ PM should look for opportunities to present the base mission, AICUZ and AFEM programs to the public. Often, homeowner associations are looking for relevant presentations for their meetings. When attending meetings, you are the ‘eyes and ears’ of your command. Listen to your neighbors and bring their concerns back to the base for resolution, if possible. Often, just listening will reduce their concerns.

**7.9. Working with Other Bases.** In regions where multiple bases and services are located, ensure that community efforts are coordinated. All services experience encroachment challenges to some degree, particularly those resulting from urban growth. The DoD message must be consistent and this requires cooperation.



## CHAPTER 8

### MONITORING AND CONCLUSION

**8.1. Monitoring.** Monitoring for operational changes is critical to a successful AICUZ program. Change is the only constant in our temporary world. Operational tempo varies depending on budget, mission and world events. New aircraft enter the inventory and legacy aircraft retire. Maintaining situational awareness is critical to mission preservation and sustainability. As missions and communities change and public perceptions evolve, we need to adapt our AICUZ implementation strategies to compensate.

8.1.1. The AICUZ PM is responsible for monitoring AICUZ implementation, which will generally involve the airfield environs. These responsibilities should be coordinated with the IEMT to ensure that there are no gaps in coverage and that overlap is minimal.

8.1.2. While we continue to monitor encroachment indicators through media monitoring, networking, and participation in the planning process, there are some events that may be game changers:

8.1.2.1. Changes on the airfield can be caused by new missions, addition or closure of a runway, introduction of a new aircraft, changes in flight tracks, etc., possibly leading to changes in the AICUZ footprint. Be alert for operational changes that could alter flight tracks, runway preference, and operational tempo.

8.1.2.2. Updates to the noise contours and revisions to the AICUZ study might require a change in strategy when working with the community. Communities seldom consider temporary operational changes, such as deployments or runway repairs, in their land use policy. Communities think long term when considering their development and growth in much the same way we think long term when considering the sustainability of our installations and missions.

8.1.2.3. Changes in federal or state legislation or regulations may also impact the mission. Federal air quality requirements could negatively affect aircraft basing by restricting operations in a non-attainment area. State legislation can result in granting or broadening zoning authority to local communities. However, legislators can also roll back existing enabling legislation and prevent communities that want to help protect bases and missions from adopting land use controls beneficial to our missions. As discussed in [Chapter 6](#), you should become familiar with the elected representatives for your community.

8.1.2.4. On the local level, emerging city development plans and even annexations could impact our AICUZ implementation strategies.

8.1.2.5. Political climates also change. The next election could bring in a pro-growth or no growth City Council. Each election cycle will likely require an update of your stakeholders' list and changes in outreach strategy. It is essential that the AICUZ PM introduces themselves to newly elected officials or their staff, establishes positive relationships and seizes opportunities to advise and educate them about the base, the base missions and the AICUZ program.

8.1.2.6. Finally, emerging technologies may create new encroachment challenges similar to the way renewable energy resources and personal communication systems have presented new challenges in the past two decades.

8.1.3. As changes occur, we improvise, adapt, and overcome. To stay relevant, we must modify implementation strategies when necessary to effectively promote and achieve compatible development.

**8.2. Conclusion.** The AICUZ program provides the tools to achieve compatible development. In practice, we – the Air Force – may not achieve all the land use controls we seek. We need to know when to compromise – sometimes getting something is better than getting nothing. There are also times we cannot reach agreement. At that point, we need to re-evaluate our strategies and our relationship with the community and try another approach.

8.2.1. This handbook provides the tools you need to implement an AICUZ program. However, it is not the end all in AICUZ and managing encroachment. Network with other AICUZ PMs to learn their strategies and what has or has not worked for their base. Take advantage of available training and reach back support.

8.2.2. If you want to know more about AICUZ and encroachment management, visit the AFEM SharePoint® at <https://portal.afcec.hedc.af.mil/CP/CPP/CPPR/SitePages/Home.aspx>. AFCEC/CP is available for mentoring support and to assist you with your program.

TIMOTHY S. GREEN, Major General, USAF  
Director of Civil Engineers

## ATTACHMENT 1

## GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

*References*

NOTE: The user of this instruction is responsible for verifying the currency of the cited documents.

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**AFI 35-108**, *Environmental Public Affairs*, 14 July 2015

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**Federal Management Circular 75-2**, *Compatible Land Uses at Federal Airfields*, 30 September 1975

**Unified Facilities Code 3-260-01**, *Airfield and Heliport Planning and Design*, November 2008

*Abbreviations and Acronyms*

**AAD**—Average Annual Day

**AAM**—Advanced Acoustic Model

**AFB**—Air Force Base

**AFCEC**—Air Force Civil Engineer Center

**AFCEC/CP**—Air Force Civil Engineer Center, Planning and Integration Directorate

**AFCEC/CPP**—Air Force Civil Engineer Center, Comprehensive Planning Division

**AFCEC/CI**—Air Force Civil Engineer Center, Installations Directorate

**AFCEC/CZ**—Air Force Civil Engineer Center, Environmental Directorate

**AFCEC/CZP**—Air Force Civil Engineer Center, Regulatory and Legislative Branch

**AFCEC GIO**—Air Force Geospatial Integration Officer

**AFEM**—Air Force Encroachment Management

**AFH**—Air Force Handbook

**AFI**—Air Force Instruction

**AFLOA**—Air Force Legal Operations Agency

**AFLOA/JACE**—Air Force Legal Operations Agency Environmental Law and Litigation Division

**AFM**—Air Force Manual

**AFPD**—Air Force Policy Directive

**AFR**—Air Force Regulation

**AFRC**—Air Force Reserve Command

**AFSEC**—Air Force Safety Center

**AFSIR**—Air Force Spectrum Interference Office

**AICUZ**—Air Installations Compatible Use Zones

**AICUZ PM**—AICUZ Program Manager

**ANG**—Air National Guard

**APA**—American Planning Association

**APZ**—Accident Potential Zones

**ATC**—Air Traffic Control

**BASH**—Bird/Wildlife Air Strike Hazard

**CATEX**—Categorical Exclusion

**CDNL-C-weighted Day**—Night Average Sound Level

**CFR**—Code of Federal Regulations

**CNEL**—Community Noise Equivalent Level

**COR**—Contracting Officer Representative

**dB**—Decibel

**DNL-Day**—Night Average Sound Level

**DoD**—Department of Defense

**DoDI**—Department of Defense Instruction

**Du/Ac**—Dwelling units per acre

**EIAP**—Environmental Impact Analysis Process

**EMI**—Electromagnetic Interference

**FAA**—Federal Aviation Administration

**FAR**—Federal Aviation Regulation

**FHA**—Federal Home Administration

**FICON**—Federal Interagency Committee on Noise

**FMC**—Federal Management Circular

**GIS**—Geographic Information System

**GSA**—General Services Administration

**HAF**—Headquarters, United States Air Force

**HAFZ**—Hazards to Aircraft Flight Zone

**HERO**—Hazards of Electromagnetic Radiation to Ordnance

**HUD**—Department of Housing and Urban Development

**IC**—Installation Complex

**IC/MF**—Installation Complex/Mission Footprint

**ICEMAP**—Installation Complex Encroachment Management Action Plan

**IEMT**—Installation Encroachment Management Team

**IFR**—Instrument Flight Rule

**INM—Integrated Noise Model—JLUS**—Joint Land Use Study

**LBCS**—Land Based Classification System

**MAJCOM**—Major Command

**MF**—Mission Footprint

**NEPA**—National Environmental Policy Act of 1969

**NLR**—Noise Level Reduction

**NM**—Nautical Mile

**NMMOD**—Noise Model Operational Data Documentation

**OEA**—Office of Economic Adjustment

**OSD**—Office of the Secretary of Defense

**PA**—Public Affairs

**POC**—Point of Contact

**PV**—Photovoltaic

**REPI**—Readiness and Environmental Protection Integration

**SEL**—Sound Exposure Level

**SGHAT**—Solar Glare Hazard Analysis Tool

**SLUCM**—Standard Land Use Coding Manual

**TERPS**—Terminal Instrument Procedures

**UFC**—Unified Facilities Criteria

**VA**—Veterans Affairs

**VFR**—Visual Flight Rules

**WWII**—World War Two

### *Terms*

**Average Annual Day**—The AAD represents the average number of daily airfield operations that would occur during a 24-hour period based on 365 flying days per year. AAD is calculated by dividing the total annual airfield operations by 365 days.

**Attenuation**—A decrease in a property, as energy, per unit area of a wave or a beam of particles, occurring as the distance from the source increases as a result of absorption, scattering, spreading in three dimensions.

**BASEOPS**—A computerized program for entering operational data needed to compute the total noise exposure around an installation.

**C-weighted Day-Night Average Sound Level (CDNL or symbol-LCdn)**—CDNL is used for low frequency impulsive sounds, such as sonic booms, heavy weapons, and other explosions because they are perceived by humans not only by the ear, but also by the whole body as pressure or vibration. When experienced indoors, impulsive sounds can create secondary noise from rattling and vibrations of the building. See DNL for additional discussion. (See ANSI S1.1 for scientifically agreed upon definition.)

**Community Noise Equivalent Level (CNEL [symbol Lden])**—CNEL is similar to DNL but adds an evening penalty of 5 dB to all operations occurring between the hours of 7:00 p.m. and 10:00 p.m., in addition to the night penalty of 10 dB from 10:00 p.m. until 7:00 a.m. CNEL is used for land use planning and environmental analysis for all installations in the State of California. (See also DNL.). **NOTE:** The symbol Lden should not be confused with the noise descriptor used in Japan, Day, Night, Evening Level, abbreviated Lden. Although CNEL and Lden are similar, in that each has an evening penalty, CNEL defines evening as a three-hour period and Japan defines evening as a four-hour period.

**Day Night Average Sound Level (DNL [symbol—Ldn])**—A twenty four hour average A-weighted sound level for a given day after the addition of a 10 dB weighting is added to account for the increased sensitivity of humans to noise from such things as aircraft operations for sound levels that occur between the hours of 10 p.m. to 7 a.m. because ambient sound levels at night are typically lower than during the daytime hours. (See ANSI S1.1 for scientifically agreed upon definition.)

**Hazards to Aircraft Flight Zone**—This zone is defined as the area on the ground within the “Imaginary Surfaces” that are described in the UFC 3-260-01, and in Federal Aviation Regulation (FAR) Part 77, *Objects Affecting Navigable Airspace*, Subpart C: *Obstruction Standards*. This is the area that will be evaluated for compatibility related to height, visual interference, glint/glare, bird/wildlife aircraft strike hazard, and radio frequency/electromagnetic interference.

**Installation Complex**—The land, facilities, airspace and ranges providing direct mission support to and/or are managed by the installation. This includes a combination of land and facilities comprised of a main installation and its noncontiguous properties (auxiliary airfields, annexes, and missile fields) that provide direct support to or are supported by that installation. Installation complexes may comprise two or more properties (e.g., a major installation, a minor installation, or a support site), each with its associated annexes or support properties.

**Installation Complex Encroachment Management Action Plan (ICEMAP)**—The ICEMAP is a planning product that documents the results of a comprehensive encroachment study addressing current and future encroachment and sustainment challenges facing the installation complex and surrounding communities.

**Installation Encroachment Management Team (IEMT)**—A cross-functional team established in accordance with section 3.3.2.3 of AFI 90-2001, designed to address encroachment issues within the installation complex.

**Land Based Classification System**—The Land Based Classification Standards (LBCS) model extends the notion of classifying land uses by refining traditional categories into multiple dimensions, such as activities, functions, building types, site development character, and ownership constraints. Each dimension has its own set of categories and subcategories.

**Noise contour line**—Lines on a map connecting points of equal noise levels.

**NOISEMAP**—A suite of computer programs developed for prediction of noise exposure in the vicinity of an installation due to aircraft flight, maintenance, and ground run-up operations.

**Noise Zone**—A range of noise levels generally bounded by two noise contours, e.g. 65-70 dB DNL or >75 dB DNL.

**Operational Data**—Operational data covers multiple types of data associated with aircraft operations (i.e., type of aircraft, power setting, altitude, flight track, etc.).

**Peak Sound Pressure (symbol—Lpk)**—Level of peak sound pressure with stated frequency weighting, within a stated time interval. The decibel version of the peak overpressure that is used as needed to describe a noise event such as a sonic boom or blast for the purposes of relating it to human and animal response. For impulsive sounds, it is the true instantaneous sound pressure (e.g., the peak pressure of the shock wave for sonic booms). This pressure is usually presented in physical units of pounds per square foot. DoD uses un-weighted peak, so make sure the weighting factor is denoted. (See ANSI S1.1 for scientifically agreed upon definition.)

**Standard Land Use Coding Manual**—Published in 1965 by the Federal Highways Administration and the Department of Housing and Urban Development, the SLUCM manual provided a detailed listing of land use categories with numeric codes assigned to them. This numeric coding system used two, three, four, or more digits to identify land use activities.



## Attachment 2

## LAND USE COMPATIBILITY RECOMMENDATIONS FOR APZS

**A2.1.** Suggested land use compatibility guidelines in the Clear Zone and APZs are shown in Table A2.1. Additions to some land use categories have been incorporated into Table A2.1 subsequent to issuance of the SLUCM to reflect additional land uses and to clarify the categorization of certain uses. The compatible land use recommendations for the Clear Zone and APZ are provided for local governments as well as AF personnel for on-base planning.

Table A2.1. Land Use Compatibility in APZs.

| LAND USE  |   | SUGGESTED LAND USE COMPATIBILITY <sup>1</sup> |       |                |   |
|-----------|---|---|-------|----------------|---|
| SLUCM NO. | LAND USE NAME   | CLEAR ZONE                                    | APZ-I | APZ-II         | DENSITY                                       |
| 10        | Residential   |   |       |                |   |
| 11        | Household Units   |   |       |                |   |
| 11.11     | Single units: detached  | N   | N     | Y <sup>2</sup> | Maximum density of 2 Du/Ac                    |
| 11.12     | Single units: semi-detached   | N   | N     | N              |   |
| 11.13     | Single units: attached row  | N   | N     | N              |   |
| 11.21     | Two units: side-by-side   | N   | N     | N              |   |
| 11.22     | Two units: one above the other  | N   | N     | N              |   |
| 11.31     | Apartments: walk-up   | N   | N     | N              |   |
| 11.32     | Apartment: elevator   | N   | N     | N              |   |
| 12        | Group quarters  | N   | N     | N              |   |
| 13        | Residential hotels  | N   | N     | N              |   |
| 14        | Mobile home parks or courts   | N   | N     | N              |   |
| 15        | Transient lodgings  | N   | N     | N              |   |
| 16        | Other residential   | N   | N     | N              |   |
| 20        | Manufacturing <sup>3</sup>  |   |       |                |   |
| 21        | Food and kindred products; manufacturing  | N   | N     | Y              | Maximum FAR 0.56 IN APZ II                    |
| 22        | Textile mill products; manufacturing  | N   | N     | Y              | Maximum FAR 0.56 IN APZ II                    |
| 23        | Apparel and other finished products; products made from fabrics, leather and similar materials; manufacturing | N   | N     | N              |   |
| 24        | Lumber and wood products (except furniture); manufacturing  | N   | Y     | Y              | Maximum FAR of 0.28 in APZ I & 0.56 in APZ II |
| 25        | Furniture and fixtures; manufacturing   | N   | Y     | Y              | Maximum FAR of 0.28 in APZ I & 0.56 in APZ II |
| 26        | Paper and allied products; manufacturing  | N   | Y     | Y              | Maximum FAR of 0.28 in APZ I & 0.56 in APZ II |
| 27        | Printing, publishing, and allied industries   | N   | Y     | Y              | Maximum FAR of 0.28 in APZ I & 0.56 in APZ II |

| LAND USE  |   | SUGGESTED LAND USE COMPATIBILITY <sup>1</sup> |                |                |   |
|-----------|---|---|----------------|----------------|---|
| SLUCM NO. | LAND USE NAME   | CLEAR ZONE                                    | APZ-I          | APZ-II         | DENSITY                                       |
| 28        | Chemicals and allied products; manufacturing  | N   | N              | N              |   |
| 29        | Petroleum refining and related industries   | N   | N              | N              |   |
| 30        | Manufacturing <sup>3</sup> (continued)  |   |                |                |   |
| 31        | Rubber and miscellaneous plastic products; manufacturing  | N   | N              | N              |   |
| 32        | Stone, clay, and glass products; manufacturing  | N   | N              | Y              | Maximum FAR 0.56 in APZ II                    |
| 33        | Primary metal products; manufacturing   | N   | N              | Y              | Maximum FAR 0.56 in APZ II                    |
| 34        | Fabricated metal products; manufacturing  | N   | N              | Y              | Maximum FAR 0.56 in APZ II                    |
| 35        | Professional, scientific, and controlling instruments; photographic and optical goods; watches and clocks | N   | N              | N              |   |
| 39        | Miscellaneous manufacturing   | N   | Y              | Y              | Maximum FAR of 0.28 in APZ I & 0.56 in APZ II |
| 40        | Transportation, communication, and utilities <sup>3, 4</sup>  |   |                |                |   |
| 41        | Railroad, rapid rail transit, and street railway transportation   | N   | Y <sup>6</sup> | Y              | Maximum FAR of 0.28 in APZ I & 0.56 in APZ II |
| 42        | Motor vehicle transportation  | N   | Y <sup>6</sup> | Y              | Maximum FAR of 0.28 in APZ I & 0.56 in APZ II |
| 43        | Aircraft transportation   | N   | Y <sup>6</sup> | Y              | Maximum FAR of 0.28 in APZ I & 0.56 in APZ II |
| 44        | Marine craft transportation   | N   | Y <sup>6</sup> | Y              | Maximum FAR of 0.28 in APZ I & 0.56 in APZ II |
| 45        | Highway and street right-of-way   | Y <sup>5</sup>                                | Y <sup>6</sup> | Y              | Maximum FAR of 0.28 in APZ I & 0.56 in APZ II |
| 46        | Automobile parking  | N   | Y <sup>6</sup> | Y              | Maximum FAR of 0.28 in APZ I & 0.56 in APZ II |
| 47        | Communication   | N   | Y <sup>6</sup> | Y              | Maximum FAR of 0.28 in APZ I & 0.56 in APZ II |
| 48        | Utilities <sup>7</sup>  | N   | Y <sup>6</sup> | Y <sup>6</sup> | Maximum FAR of 0.28 in APZ I & 0.56 in APZ II |
| 48.5      | Solid waste disposal (landfills, incinerators, etc.)  | N   | N              | N              |   |
| 49        | Other transportation, communication, and utilities  | N   | Y <sup>6</sup> | Y              | See Note 6 below                              |
| 50        | Trade   |   |                |                |   |

| LAND USE  |  | SUGGESTED LAND USE COMPATIBILITY <sup>1</sup> |                 |                 |  |
|-----------|--|---|-----------------|-----------------|--|
| SLUCM NO. | LAND USE NAME  | CLEAR ZONE                                    | APZ-I           | APZ-II          | DENSITY  |
| 51        | Wholesale trade  | N   | Y               | Y               | Maximum FAR of 0.28 in APZ I & .56 in APZ II     |
| 52        | Retail trade – building materials, hardware and farm equipment                                   | N   | Y               | Y               | See Note 8 below                                 |
| 53        | Retail trade – including, discount clubs, home improvement stores, electronics superstores, etc. | N   | N               | Y               | Maximum FAR of 0.16 in APZ II                    |
| 53.       | Shopping centers-Neighborhood, Community, Regional, Super-regional <sup>9</sup>                  | N   | N               | N               |  |
| 54        | Retail trade – food  | N   | N               | Y               | Maximum FAR of 0.24 in APZ II                    |
| 55        | Retail trade – automotive, marine craft, aircraft, and accessories                               | N   | Y               | Y               | Maximum FAR of 0.14 in APZ I & 0.28 in APZ II    |
| 56        | Retail trade – apparel and accessories   | N   | N               | Y               | Maximum FAR of 0.28 in APZ II                    |
| 57        | Retail trade – furniture, home, furnishings and equipment  | N   | N               | Y               | Maximum FAR of 0.28 in APZ II                    |
| 58        | Retail trade – eating and drinking establishments  | N   | N               | N               |  |
| 59        | Other retail trade   | N   | N               | Y               | Maximum FAR of 0.16 in APZ II                    |
| 60        | Services <sup>10</sup>   |   |                 |                 |  |
| 61        | Finance, insurance and real estate services  | N   | N               | Y               | Maximum FAR of 0.22 in APZ II                    |
| 62        | Personal services  | N   | N               | Y               | Office uses only. Maximum FAR of 0.22 in APZ II. |
| 62.4      | Cemeteries   | N   | Y <sup>11</sup> | Y <sup>11</sup> |  |
| 63        | Business services (credit reporting; mail, stenographic, reproduction; advertising)              | N   | N               | Y               | Maximum FAR of 0.22 in APZ II                    |
| 63.7      | Warehousing and storage services <sup>12</sup>   | N   | Y               | Y               | Maximum FAR of 1.0 in APZ I; 2.0 in APZ II       |
| 64        | Repair Services  | N   | Y               | Y               | Maximum FAR of 0.11 APZ I; 0.22 in APZ II        |
| 65        | Professional services  | N   | N               | Y               | Maximum FAR of 0.22 in APZ II                    |
| 65.1      | Hospitals, nursing homes   | N   | N               | N               |  |
| 65.1      | Other medical facilities   | N   | N               | N               |  |
| 66        | Contract construction services   | N   | Y               | Y               | Maximum FAR of 0.11 APZ I; 0.22 in APZ II        |
| 67        | Government Services  | N   | N               | Y               | Maximum FAR of 0.24 in APZ II                    |
| 68        | Educational services   | N   | N               | N               |  |

| LAND USE   |  | SUGGESTED LAND USE COMPATIBILITY <sup>1</sup> |                 |                 |   |
|------------|--|---|-----------------|-----------------|---|
| SLUCM NO.  | LAND USE NAME  | CLEAR ZONE                                    | APZ-I           | APZ-II          | DENSITY   |
| 68.1       | Child care services, child development centers, and nurseries                      | N   | N               | N               |   |
| 69         | Miscellaneous Services   | N   | N               | Y               | Maximum FAR of 0.22 in APZ II   |
| 69.1       | Religious activities (including places of worship)                                 | N   | N               | N               |   |
| 70         | Cultural, entertainment and recreational   |   |                 |                 |   |
| 71         | Cultural activities  | N   | N               | N               |   |
| 71.2       | Nature exhibits  | N   | Y <sup>13</sup> | Y <sup>13</sup> |   |
| 72         | Public assembly  | N   | N               | N               |   |
| 72.1       | Auditoriums, concert halls   | N   | N               | N               |   |
| 72.11      | Outdoor music shells, amphitheaters  | N   | N               | N               |   |
| 72.2       | Outdoor sports arenas, spectator sports  | N   | N               | N               |   |
| 73         | Amusements – fairgrounds, miniature golf, driving ranges; amusement parks, etc.    | N   | N               | Y <sup>20</sup> |   |
| 74         | Recreational activities (including golf courses, riding stables, water recreation) | N   | Y <sup>13</sup> | Y <sup>13</sup> | Maximum FAR of 0.11 in APZ I; 0.22 in APZ II  |
| 75         | Resorts and group camps  | N   | N               | N               |   |
| 76         | Parks  | N   | Y <sup>13</sup> | Y <sup>13</sup> | Maximum FAR of 0.11 in APZ I; 0.22 in APZ II  |
| 79         | Other cultural, entertainment and recreation                                       | N   | Y <sup>11</sup> | Y <sup>11</sup> | Maximum FAR of 0.11 in APZ I; 0.22 in APZ II  |
| 80         | Resource production and extraction   |   |                 |                 |   |
| 81         | Agriculture (except live-stock)  | Y <sup>4</sup>                                | Y <sup>14</sup> | Y <sup>14</sup> |   |
| 81.5-81.7, | Agriculture-Livestock farming, including grazing and feedlots                      | N   | Y <sup>14</sup> | Y <sup>14</sup> |   |
| 82         | Agriculture related activities   | N   | Y <sup>15</sup> | Y <sup>15</sup> | Maximum FAR of 0.28 in APZ I; 0.56 in APZ II, no activity which produces smoke, glare, or involves explosives |
| 83         | Forestry activities <sup>16</sup>  | N   | Y               | Y               | Maximum FAR of 0.28 in APZ I; 0.56 in APZ II, no activity which produces smoke, glare, or involves explosives |
| 84         | Fishing activities <sup>17</sup>   | N <sup>17</sup>                               | Y               | Y               | Maximum FAR of 0.28 in APZ I; 0.56  |

| LAND USE  |   | SUGGESTED LAND USE COMPATIBILITY <sup>1</sup> |                 |                 |   |
|-----------|---|---|-----------------|-----------------|---|
| SLUCM NO. | LAND USE NAME                           | CLEAR ZONE                                    | APZ-I           | APZ-II          | DENSITY   |
|           |   |   |                 |                 | in APZ II, no activity which produces smoke, glare, or involves explosives                                    |
| 85        | Mining activities <sup>18</sup>         | N   | Y <sup>18</sup> | Y <sup>18</sup> | Maximum FAR of 0.28 in APZ I; 0.56 in APZ II, no activity which produces smoke, glare, or involves explosives |
| 89        | Other resource production or extraction | N   | Y               | Y               | Maximum FAR of 0.28 in APZ I; 0.56 in APZ II, no activity which produces smoke, glare, or involves explosives |
| 90        | Other                                   |   |                 |                 |   |
| 91        | Undeveloped land                        | Y   | Y               | Y               |   |
| 93        | Water areas <sup>19</sup>               | N <sup>19</sup>                               | N <sup>19</sup> | N <sup>19</sup> |   |

**NOTES:**

1. A “Yes” or a “No” designation for compatible land use is to be used only for general comparison. Within each, uses exist where further evaluation may be needed in each category as to whether it is clearly compatible, normally compatible, or not compatible due to the variation of densities of people and structures. In order to assist air installations and local governments, general suggestions as to FARs are provided as a guide to density in some categories. In general, land use restrictions that limit occupants, including employees, of commercial, service, or industrial buildings or structures to 25 an acre in APZ I and 50 an acre in APZ II are considered to be low density. Outside events should normally be limited to assemblies of not more than 25 people an acre in APZ I, and maximum assemblies of 50 people an acre in APZ II.

Recommended FARs are calculated using standard parking generation rates for various land uses, vehicle occupancy rates, and desired density in APZ I and II. For APZ I, the formula is  $FAR = 25 \text{ people an acre} / (\text{Average Vehicle Occupancy} \times \text{Average Parking Rate} \times (43560/1000))$ . The formula for APZ II is  $FAR = 50 / (\text{Average Vehicle Occupancy} \times \text{Average Parking Rate} \times (43560/1000))$ .

2. The suggested maximum density for detached single-family housing is two Du/Ac. In a planned unit development (PUD) of single family detached units, where clustered housing development results in large open areas, this density could possibly be increased slightly provided the amount of surface area covered by structures does not exceed 20 percent of the PUD total area. PUD encourages clustered development that leaves large open areas.

3. Other factors to be considered: Labor intensity, structural coverage, explosive characteristics, air-pollution, electronic interference with aircraft, height of structures, and potential glare to pilots.

4. No structures (except airfield lighting and navigational aids necessary for the safe operation of the airfield when there are no other siting options), buildings, or above-ground utility and

communications lines should normally be located in Clear Zone areas on or off the air installation. The Clear Zone is subject to the most severe restrictions.

5. Roads within the graded portion of the Clear Zone are prohibited. All roads within the Clear Zone are discouraged, but if required, they should not be wider than two lanes and the rights-of-way should be fenced (frangible) and not include sidewalks or bicycle trails. Nothing associated with these roads should violate obstacle clearance criteria.
6. No above ground passenger terminals and no above ground power transmission or distribution lines. Prohibited power lines include high-voltage transmission lines and distribution lines that provide power to cities, towns, or regional power for unincorporated areas.
7. Development of renewable energy resources, including solar and geothermal facilities and wind turbines, may impact military operations through hazards to flight or electromagnetic interference. Each new development should to be analyzed for compatibility issues on a case-by-case basis that considers both the proposal and potentially affected mission.
8. Within SLUCM Code 52, maximum FARs for lumberyards (SLUCM Code 521) are 0.20 in APZ-I and 0.40 in APZ-II; the maximum FARs for hardware, paint, and farm equipment stores, (SLUCM Code 525), are 0.12 in APZ I and 0.24 in APZ II.
9. A shopping center is an integrated group of commercial establishments that is planned, developed, owned, or managed as a unit. Shopping center types include strip, neighborhood, community, regional, and super-regional facilities anchored by small businesses, a supermarket or drug store, discount retailer, department store, or several department stores, respectively.
10. Ancillary uses such as meeting places, auditoriums, etc. are not recommended.
11. No chapels or houses of worship are allowed within APZ I or APZ II.
12. Big box home improvement stores are not included as part of this category.
13. Facilities must be low intensity, and provide no playgrounds, etc. Facilities such as clubhouses, meeting places, auditoriums, large classes, etc., are not recommended.
14. Activities that attract concentrations of birds creating a hazard to aircraft operations should be excluded.
15. Factors to be considered: labor intensity, structural coverage, explosive characteristics, and air pollution.
16. Lumber and timber products removed due to establishment, expansion, or maintenance of Clear Zone lands owned in fee will be disposed of in accordance with applicable DoD guidance.
17. Controlled hunting and fishing may be permitted for the purpose of wildlife management.
18. Surface mining operations that could create retention ponds that may attract waterfowl and present bird/wildlife aircraft strike hazards (BASH), or operations that produce dust or light emissions that could affect pilot vision are not compatible.
19. Naturally occurring water features (e.g., rivers, lakes, streams, wetlands) are pre-existing, nonconforming land uses. Naturally occurring water features that attract waterfowl present a potential BASH. Actions to expand naturally occurring water features or construction of new water features should not be encouraged. If construction of new features is necessary for storm water retention, such features should be designed so that they do not attract waterfowl.
20. Amusement centers, family entertainment centers or amusement parks designed or operated at a scale that could attract or result in concentrations of people, including employees and visitors, greater than 50 people per acre at any given time are incompatible in APZ II.

## Attachment 3

## RECOMMENDED LAND USE COMPATIBILITY FOR NOISE ZONES

**A3.1.** Suggested land use compatibility guidelines for noise zones are shown in Table A3.1. Additions to some land use categories have been incorporated into Table A3.1 subsequent to issuance of the SLUCM to reflect additional land uses and to clarify the categorization of certain uses. Tables A3.2 and Table A3.3 provide land use compatibility recommendations in relation to ground training noise sources such as small arms and blast noise from large caliber munitions and explosives. The land use compatibility recommendations are provided for local governments as well as AF for on-base planning.

Table A3.1. Land Use Compatibility in Aircraft Noise Zones.

| LAND USE  |  | SUGGESTED LAND USE COMPATIBILITY |                         |                         |                         |                       |
|-----------|--|----------------------------------|-------------------------|-------------------------|-------------------------|-----------------------|
| SLUCM NO. | LAND USE NAME  | DNL or<br>CNEL<br>65-69          | DNL or<br>CNEL<br>70-74 | DNL or<br>CNEL<br>75-79 | DNL or<br>CNEL<br>80-84 | DNL or<br>CNEL<br>85+ |
| 10        | Residential  |                                  |                         |                         |                         |                       |
| 11        | Household units  | N <sup>1</sup>                   | N <sup>1</sup>          | N                       | N                       | N                     |
| 11.11     | Single units: detached   | N <sup>1</sup>                   | N <sup>1</sup>          | N                       | N                       | N                     |
| 11.12     | Single units: semidetached   | N <sup>1</sup>                   | N <sup>1</sup>          | N                       | N                       | N                     |
| 11.13     | Single units: attached row   | N <sup>1</sup>                   | N <sup>1</sup>          | N                       | N                       | N                     |
| 11.21     | Two units: side-by-side  | N <sup>1</sup>                   | N <sup>1</sup>          | N                       | N                       | N                     |
| 11.22     | Two units: one above the other   | N <sup>1</sup>                   | N <sup>1</sup>          | N                       | N                       | N                     |
| 11.31     | Apartments: walk-up  | N <sup>1</sup>                   | N <sup>1</sup>          | N                       | N                       | N                     |
| 11.32     | Apartment: elevator  | N <sup>1</sup>                   | N <sup>1</sup>          | N                       | N                       | N                     |
| 12        | Group quarters   | N <sup>1</sup>                   | N <sup>1</sup>          | N                       | N                       | N                     |
| 13        | Residential hotels   | N <sup>1</sup>                   | N <sup>1</sup>          | N                       | N                       | N                     |
| 14        | Mobile home parks or courts  | N                                | N                       | N                       | N                       | N                     |
| 15        | Transient lodgings   | N <sup>1</sup>                   | N <sup>1</sup>          | N <sup>1</sup>          | N                       | N                     |
| 16        | Other residential  | N <sup>1</sup>                   | N <sup>1</sup>          | N                       | N                       | N                     |
| 20        | Manufacturing  |                                  |                         |                         |                         |                       |
| 21        | Food and kindred products; manufacturing   | Y                                | Y <sup>2</sup>          | Y <sup>3</sup>          | Y <sup>4</sup>          | N                     |
| 22        | Textile mill products; manufacturing   | Y                                | Y <sup>2</sup>          | Y <sup>3</sup>          | Y <sup>4</sup>          | N                     |
| 23        | Apparel and other finished products; products made from fabrics, leather, and similar materials; manufacturing | Y                                | Y <sup>2</sup>          | Y <sup>3</sup>          | Y <sup>4</sup>          | N                     |
| 24        | Lumber and wood products (except furniture); manufacturing   | Y                                | Y <sup>2</sup>          | Y <sup>3</sup>          | Y <sup>4</sup>          | N                     |
| 25        | Furniture and fixtures; manufacturing  | Y                                | Y <sup>2</sup>          | Y <sup>3</sup>          | Y <sup>4</sup>          | N                     |
| 26        | Paper and allied products; manufacturing   | Y                                | Y <sup>2</sup>          | Y <sup>3</sup>          | Y <sup>4</sup>          | N                     |
| 27        | Printing, publishing, and allied industries  | Y                                | Y <sup>2</sup>          | Y <sup>3</sup>          | Y <sup>4</sup>          | N                     |
| 28        | Chemicals and allied products; manufacturing   | Y                                | Y <sup>2</sup>          | Y <sup>3</sup>          | Y <sup>4</sup>          | N                     |

| LAND USE  |   | SUGGESTED LAND USE COMPATIBILITY |                         |                         |                         |                       |
|-----------|---|----------------------------------|-------------------------|-------------------------|-------------------------|-----------------------|
| SLUCM NO. | LAND USE NAME   | DNL or<br>CNEL<br>65-69          | DNL or<br>CNEL<br>70-74 | DNL or<br>CNEL<br>75-79 | DNL or<br>CNEL<br>80-84 | DNL or<br>CNEL<br>85+ |
| 29        | Petroleum refining and related industries   | Y                                | Y <sup>2</sup>          | Y <sup>3</sup>          | Y <sup>4</sup>          | N                     |
| 30        | Manufacturing (continued)   |                                  |                         |                         |                         |                       |
| 31        | Rubber and misc. plastic products; manufacturing  | Y                                | Y <sup>2</sup>          | Y <sup>3</sup>          | Y <sup>4</sup>          | N                     |
| 32        | Stone, clay and glass products; manufacturing   | Y                                | Y <sup>2</sup>          | Y <sup>3</sup>          | Y <sup>4</sup>          | N                     |
| 33        | Primary metal products; manufacturing   | Y                                | Y <sup>2</sup>          | Y <sup>3</sup>          | Y <sup>4</sup>          | N                     |
| 34        | Fabricated metal products; manufacturing  | Y                                | Y <sup>2</sup>          | Y <sup>3</sup>          | Y <sup>4</sup>          | N                     |
| 35        | Professional scientific, and controlling instruments; photographic and optical goods; watches and clocks          | Y                                | 25                      | 30                      | N                       | N                     |
| 39        | Miscellaneous manufacturing   | Y                                | Y <sup>2</sup>          | Y <sup>3</sup>          | Y <sup>4</sup>          | N                     |
| 40        | Transportation, communication and utilities   |                                  |                         |                         |                         |                       |
| 41        | Railroad, rapid rail transit, and street railway transportation   | Y                                | Y <sup>2</sup>          | Y <sup>3</sup>          | Y <sup>4</sup>          | N                     |
| 42        | Motor vehicle transportation  | Y                                | Y <sup>2</sup>          | Y <sup>3</sup>          | Y <sup>4</sup>          | N                     |
| 43        | Aircraft transportation   | Y                                | Y <sup>2</sup>          | Y <sup>3</sup>          | Y <sup>4</sup>          | N                     |
| 44        | Marine craft transportation   | Y                                | Y <sup>2</sup>          | Y <sup>3</sup>          | Y <sup>4</sup>          | N                     |
| 45        | Highway and street right-of-way   | Y                                | Y                       | Y                       | Y                       | N                     |
| 46        | Automobile parking  | Y                                | Y                       | Y                       | Y                       | N                     |
| 47        | Communication   | Y                                | 25 <sup>5</sup>         | 30 <sup>5</sup>         | N                       | N                     |
| 48        | Utilities   | Y                                | Y <sup>2</sup>          | Y <sup>3</sup>          | Y <sup>4</sup>          | N                     |
| 49        | Other transportation, communication and utilities   | Y                                | 25 <sup>5</sup>         | 30 <sup>5</sup>         | N                       | N                     |
| 50        | Trade   |                                  |                         |                         |                         |                       |
| 51        | Wholesale trade   | Y                                | Y <sup>2</sup>          | Y <sup>3</sup>          | Y <sup>4</sup>          | N                     |
| 52        | Retail trade – building materials, hardware and farm equipment  | Y                                | 25                      | 30                      | Y <sup>4</sup>          | N                     |
| 53        | Retail trade – including shopping centers, discount clubs, home improvement stores, electronics superstores, etc. | Y                                | 25                      | 30                      | N                       | N                     |
| 54        | Retail trade – food   | Y                                | 25                      | 30                      | N                       | N                     |
| 55        | Retail trade – automotive, marine craft, aircraft and accessories   | Y                                | 25                      | 30                      | N                       | N                     |
| 56        | Retail trade – apparel and accessories  | Y                                | 25                      | 30                      | N                       | N                     |
| 57        | Retail trade – furniture, home, furnishings and equipment   | Y                                | 25                      | 30                      | N                       | N                     |
| 58        | Retail trade – eating and   | Y                                | 25                      | 30                      | N                       | N                     |



| LAND USE  |  | SUGGESTED LAND USE COMPATIBILITY |                         |                         |                         |                       |
|-----------|--|----------------------------------|-------------------------|-------------------------|-------------------------|-----------------------|
| SLUCM NO. | LAND USE NAME  | DNL or<br>CNEL<br>65-69          | DNL or<br>CNEL<br>70-74 | DNL or<br>CNEL<br>75-79 | DNL or<br>CNEL<br>80-84 | DNL or<br>CNEL<br>85+ |
|           | drinking establishments  |                                  |                         |                         |                         |                       |
| 59        | Other retail trade   | Y                                | 25                      | 30                      | N                       | N                     |
| 60        | Services   |                                  |                         |                         |                         |                       |
| 61        | Finance, insurance and real estate services  | Y                                | 25                      | 30                      | N                       | N                     |
| 62        | Personal services  | Y                                | 25                      | 30                      | N                       | N                     |
| 62.4      | Cemeteries   | Y                                | Y <sup>2</sup>          | Y <sup>3</sup>          | Y <sup>4,11</sup>       | Y <sup>6,11</sup>     |
| 63        | Business services  | Y                                | 25                      | 30                      | N                       | N                     |
| 63.7      | Warehousing and storage  | Y                                | Y <sup>2</sup>          | Y <sup>3</sup>          | Y <sup>4</sup>          | N                     |
| 64        | Repair services  | Y                                | Y <sup>2</sup>          | Y <sup>3</sup>          | Y <sup>4</sup>          | N                     |
| 65        | Professional services  | Y                                | 25                      | 30                      | N                       | N                     |
| 65.1      | Hospitals, other medical facilities  | 25                               | 30                      | N                       | N                       | N                     |
| 65.16     | Nursing homes  | N <sup>1</sup>                   | N <sup>1</sup>          | N                       | N                       | N                     |
| 66        | Contract construction services   | Y                                | 25                      | 30                      | N                       | N                     |
| 67        | Government services  | Y <sup>1</sup>                   | 25                      | 30                      | N                       | N                     |
| 68        | Educational services   | 25                               | 30                      | N                       | N                       | N                     |
| 68.1      | Child care services, child development centers, and nurseries                      | 25                               | 30                      | N                       | N                       | N                     |
| 69        | Miscellaneous Services   | Y                                | 25                      | 30                      | N                       | N                     |
| 69.1      | Religious activities (including places of worship)                                 | Y                                | 25                      | 30                      | N                       | N                     |
| 70        | Cultural, entertainment and recreational   |                                  |                         |                         |                         |                       |
| 71        | Cultural activities  | 25                               | 30                      | N                       | N                       | N                     |
| 71.2      | Nature exhibits  | Y <sup>1</sup>                   | N                       | N                       | N                       | N                     |
| 72        | Public assembly  | Y                                | N                       | N                       | N                       | N                     |
| 72.1      | Auditoriums, concert halls   | 25                               | 30                      | N                       | N                       | N                     |
| 72.11     | Outdoor music shells, amphitheaters  | N                                | N                       | N                       | N                       | N                     |
| 72.2      | Outdoor sports arenas, spectator sports  | Y <sup>7</sup>                   | Y <sup>7</sup>          | N                       | N                       | N                     |
| 73        | Amusements   | Y                                | Y                       | N                       | N                       | N                     |
| 74        | Recreational activities (including golf courses, riding stables, water recreation) | Y                                | 25                      | 30                      | N                       | N                     |
| 75        | Resorts and group camps  | Y                                | 25                      | N                       | N                       | N                     |
| 76        | Parks  | Y                                | 25                      | N                       | N                       | N                     |
| 79        | Other cultural, entertainment and recreation                                       | Y                                | 25                      | N                       | N                       | N                     |
| 80        | Resource production and extraction   |                                  |                         |                         |                         |                       |
| 81        | Agriculture (except live-stock)  | Y <sup>8</sup>                   | Y <sup>9</sup>          | Y <sup>10</sup>         | Y <sup>10,11</sup>      | Y <sup>10,11</sup>    |
| 81.5-81.7 | Agriculture-Livestock farming including grazing and feedlots                       | Y <sup>8</sup>                   | Y <sup>9</sup>          | N                       | N                       | N                     |

| LAND USE  |   | SUGGESTED LAND USE COMPATIBILITY |                         |                         |                         |                       |
|-----------|---|----------------------------------|-------------------------|-------------------------|-------------------------|-----------------------|
| SLUCM NO. | LAND USE NAME                           | DNL or<br>CNEL<br>65-69          | DNL or<br>CNEL<br>70-74 | DNL or<br>CNEL<br>75-79 | DNL or<br>CNEL<br>80-84 | DNL or<br>CNEL<br>85+ |
| 82        | Agriculture related activities          | Y <sup>8</sup>                   | Y <sup>9</sup>          | Y <sup>10</sup>         | Y <sup>10,11</sup>      | Y <sup>10,11</sup>    |
| 83        | Forestry activities                     | Y <sup>8</sup>                   | Y <sup>9</sup>          | Y <sup>10</sup>         | Y <sup>10,11</sup>      | Y <sup>10,11</sup>    |
| 84        | Fishing activities                      | Y                                | Y                       | Y                       | Y                       | Y                     |
| 85        | Mining activities                       | Y                                | Y                       | Y                       | Y                       | Y                     |
| 89        | Other resource production or extraction | Y                                | Y                       | Y                       | Y                       | Y                     |

**KEY:**

SLUCM – Standard Land Use Coding Manual, U.S. Department of Transportation

Y (Yes) – Land use and related structures compatible without restrictions.

N (No) – Land use and related structures are not compatible and should be prohibited.

Y<sup>x</sup> – Yes with restrictions. The land use and related structures generally are compatible.

However, see note(s) indicated by the superscript.

N<sup>x</sup> – No with exceptions. The land use and related structures are generally incompatible.

However, see note(s) indicated by the superscript.

25, 30, or 35 – The numbers refer to noise level reduction (NLR) levels. NLR (outdoor to indoor) is achieved through the incorporation of noise attenuation into the design and construction of a structure. Land use and related structures are generally compatible; however, measures to achieve NLR of 25, 30, or 35 must be incorporated into design and construction of structures. However, measures to achieve an overall noise reduction do not necessarily solve noise difficulties outside the structure and additional evaluation is warranted. Also, see notes indicated by superscripts where they appear with one of these numbers.

DNL – Day-Night Average Sound Level.

CNEL – Community Noise Equivalent Level (normally within a very small decibel difference of DNL)

L<sub>dn</sub> – Mathematical symbol for DNL.

**NOTES:**

## 1. General

a. Although local conditions regarding the need for housing may require residential use in these zones, residential use is discouraged in DNL 65-69 and strongly discouraged in DNL 70-74. The absence of viable alternative development options should be determined and an evaluation should be conducted locally prior to local approvals indicating that a demonstrated community need for the residential use would not be met if development were prohibited in these zones. Existing residential development is considered as pre-existing, non-conforming land uses.

b. Where the community determines that these uses must be allowed, measures to achieve outdoor to indoor NLR of at least 25 decibels (dB) in DNL 65-69 and 30 dB in DNL 70-74 should be incorporated into building codes and be considered in individual approvals; for transient housing, an NLR of at least 35 dB should be incorporated in DNL 75-79.

c. Normal permanent construction can be expected to provide an NLR of 20 dB, thus the reduction requirements are often stated as 5, 10, or 15 dB over standard construction and normally assume mechanical ventilation, upgraded sound transmission class ratings in windows and doors, and closed windows year round. Additional consideration should be given to modifying NLR levels based on peak noise levels or vibrations.

d. NLR criteria will not eliminate outdoor noise problems. However, building location, site planning, design, and use of berms and barriers can help mitigate outdoor noise exposure particularly from ground level sources. Measures that reduce noise at a site should be used wherever practical in preference to measures that only protect interior spaces.

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

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

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

5. If project or proposed development is noise sensitive, use indicated NLR; if not, land use is compatible without NLR.

6. Buildings are not permitted.

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

8. Residential buildings require an NLR of 25

9. Residential buildings require an NLR of 30.

10. Residential buildings are not permitted.

11. Land use that involves outdoor activities is not recommended, but if the community allows such activities, hearing protection devices should be worn when noise sources are present. Long-term exposure (multiple hours per day over many years) to high noise levels can cause hearing loss in some unprotected individuals.

Table A3.2. Land Use Compatibility for Small Arms Noise

| LAND USE  |  | SUGGESTED LAND USE COMPATIBILITY |                            |
|-----------|--|----------------------------------|----------------------------|
| SLUCM NO. | LAND USE NAME  | Noise Zone II<br>87-104 dBP      | Noise Zone III<br>>104 dBP |
| 10        | Residential  |                                  |                            |
| 11        | Household units  | N <sup>1</sup>                   | N                          |
| 11.11     | Single units: detached   | N <sup>1</sup>                   | N                          |
| 11.12     | Single units: semidetached   | N <sup>1</sup>                   | N                          |
| 11.13     | Single units: attached row   | N <sup>1</sup>                   | N                          |
| 11.21     | Two units: side-by-side  | N <sup>1</sup>                   | N                          |
| 11.22     | Two units: one above the other   | N <sup>1</sup>                   | N                          |
| 11.31     | Apartments: walk-up  | N <sup>1</sup>                   | N                          |
| 11.32     | Apartment: elevator  | N <sup>1</sup>                   | N                          |
| 12        | Group quarters   | N <sup>1</sup>                   | N                          |
| 13        | Residential hotels   | N <sup>1</sup>                   | N                          |
| 14        | Mobile home parks or courts  | N <sup>1</sup>                   | N                          |
| 15        | Transient lodgings   | 25                               | N                          |
| 16        | Other residential  | N <sup>1</sup>                   | N                          |
| 20        | Manufacturing  |                                  |                            |
| 21        | Food and kindred products; manufacturing   | Y <sup>2</sup>                   | Y <sup>3</sup>             |
| 22        | Textile mill products; manufacturing   | Y <sup>2</sup>                   | Y <sup>3</sup>             |
| 23        | Apparel and other finished products; products made from fabrics, leather, and similar materials; manufacturing | Y <sup>2</sup>                   | Y <sup>3</sup>             |
| 24        | Lumber and wood products (except furniture); manufacturing   | Y <sup>2</sup>                   | Y <sup>3</sup>             |
| 25        | Furniture and fixtures; manufacturing  | Y <sup>2</sup>                   | Y <sup>3</sup>             |
| 26        | Paper and allied products; manufacturing   | Y <sup>2</sup>                   | Y <sup>3</sup>             |
| 27        | Printing, publishing, and allied industries  | Y <sup>2</sup>                   | Y <sup>3</sup>             |
| 28        | Chemicals and allied products; manufacturing   | Y <sup>2</sup>                   | Y <sup>3</sup>             |
| 29        | Petroleum refining and related industries  | Y <sup>2</sup>                   | Y <sup>3</sup>             |
| 30        | Manufacturing (continued)  |                                  |                            |
| 31        | Rubber and misc. plastic products; manufacturing   | Y <sup>2</sup>                   | Y <sup>3</sup>             |
| 32        | Stone, clay and glass products; manufacturing  | Y <sup>2</sup>                   | Y <sup>3</sup>             |
| 33        | Primary metal products; manufacturing  | Y <sup>2</sup>                   | Y <sup>3</sup>             |
| 34        | Fabricated metal products; manufacturing   | Y <sup>2</sup>                   | Y <sup>3</sup>             |
| 35        | Professional scientific, and controlling instruments; photographic and optical goods; watches and clocks       | 25                               | 35                         |

| LAND USE  |   | SUGGESTED LAND USE COMPATIBILITY |                            |
|-----------|---|----------------------------------|----------------------------|
| SLUCM NO. | LAND USE NAME   | Noise Zone II<br>87-104 dBP      | Noise Zone III<br>>104 dBP |
| 39        | Miscellaneous manufacturing   | Y <sup>2</sup>                   | Y <sup>3</sup>             |
| 40        | Transportation, communication and utilities   |                                  |                            |
| 41        | Railroad, rapid rail transit, and street railway transportation   | Y <sup>2</sup>                   | Y <sup>3</sup>             |
| 42        | Motor vehicle transportation  | Y <sup>2</sup>                   | Y <sup>3</sup>             |
| 43        | Aircraft transportation   | Y <sup>2</sup>                   | Y <sup>3</sup>             |
| 44        | Marine craft transportation   | Y <sup>2</sup>                   | Y <sup>3</sup>             |
| 45        | Highway and street right-of-way   | Y <sup>2</sup>                   | Y <sup>3</sup>             |
| 46        | Automobile parking  | Y <sup>2</sup>                   | Y <sup>3</sup>             |
| 47        | Communication   | 25                               | 35                         |
| 48        | Utilities   | Y <sup>2</sup>                   | Y                          |
| 49        | Other transportation, communication and utilities   | 25                               | 35                         |
| 50        | Trade   |                                  |                            |
| 51        | Wholesale trade   | Y <sup>2</sup>                   | Y <sup>3</sup>             |
| 52        | Retail trade – building materials, hardware and farm equipment  | 25                               | 35                         |
| 53        | Retail trade – including shopping centers, discount clubs, home improvement stores, electronics superstores, etc. | 25                               | 35                         |
| 54        | Retail trade – food   | 25                               | 35                         |
| 55        | Retail trade – automotive, marine craft, aircraft and accessories   | 25                               | 35                         |
| 56        | Retail trade – apparel and accessories  | 25                               | 35                         |
| 57        | Retail trade – furniture, home, furnishings and equipment   | 25                               | 35                         |
| 58        | Retail trade – eating and drinking establishments   | 25                               | 35                         |
| 59        | Other retail trade  | 25                               | 35                         |
| 60        | Services  |                                  |                            |
| 61        | Finance, insurance and real estate services   | 25                               | 35                         |
| 62        | Personal services   | 25                               | 35                         |
| 62.4      | Cemeteries  | Y <sup>2</sup>                   | Y <sup>3</sup>             |
| 63        | Business services   | 25                               | 35                         |
| 63.7      | Warehousing and storage   | Y <sup>2</sup>                   | Y <sup>3</sup>             |
| 64        | Repair services   | Y <sup>2</sup>                   | Y <sup>3</sup>             |
| 65        | Professional services   | 25                               | N                          |
| 65.1      | Hospitals, other medical facilities   | N                                | N                          |
| 65.16     | Nursing homes   | N                                | N                          |
| 66        | Contract construction services  | 25                               | 35                         |
| 67        | Government services   | 25                               | 35                         |
| 68        | Educational services  | 35                               | N                          |
| 68.1      | Child care services, child development centers, and nurseries   | 35                               | N                          |
| 69        | Miscellaneous Services  | 35                               | N                          |

| LAND USE  |  | SUGGESTED LAND USE COMPATIBILITY |                            |
|-----------|--|----------------------------------|----------------------------|
| SLUCM NO. | LAND USE NAME  | Noise Zone II<br>87-104 dBP      | Noise Zone III<br>>104 dBP |
| 69.1      | Religious activities ( including places of worship)                                | 35                               | N                          |
| 70        | Cultural, entertainment and recreational   |                                  |                            |
| 71        | Cultural activities  | 35                               | N                          |
| 71.2      | Nature exhibits  | N                                | N                          |
| 72        | Public assembly  | N                                | N                          |
| 72.1      | Auditoriums, concert halls   | 35                               | N                          |
| 72.11     | Outdoor music shells, amphitheaters  | N                                | N                          |
| 72.2      | Outdoor sports arenas, spectator sports  | N                                | N                          |
| 73        | Amusements   | Y                                | N                          |
| 74        | Recreational activities (including golf courses, riding stables, water recreation) | N                                | N                          |
| 75        | Resorts and group camps  | N                                | N                          |
| 76        | Parks  | N                                | N                          |
| 79        | Other cultural, entertainment and recreation                                       | N                                | N                          |
| 80        | Resource production and extraction   |                                  |                            |
| 81        | Agriculture (except live- stock)   | Y <sup>a</sup>                   | Y <sup>b</sup>             |
| 81.5      | Livestock farming  | Y <sup>a</sup>                   | N                          |
| 81.7      | Animal breeding  | Y <sup>a</sup>                   | N                          |
| 82        | Agriculture related activities   | Y <sup>a</sup>                   | Y <sup>b</sup>             |
| 83        | Forestry activities  | Y <sup>a</sup>                   | Y <sup>b</sup>             |
| 84        | Fishing activities   | Y                                | Y                          |
| 85        | Mining activities  | Y                                | Y                          |
| 89        | Other resource production or extraction  | Y                                | Y                          |

**Key:**

SLUCM – Standard Land Use Coding Manual, U.S. Department of Transportation

dBP- unweighted Peak decibel level

Y (Yes) – Land use and related structures compatible without restrictions.

N (No) – Land use and related structures are not compatible and should be prohibited.

Y<sub>x</sub>– Yes with restrictions. The land use and related structures generally are compatible. However, see note(s) indicated by the superscript.

N<sub>x</sub>– No, with exceptions. The land use and related structures are generally incompatible. However, see note(s) indicated by the superscript.

25, 30, or 35 – The numbers refer to noise level reduction (NLR) levels. NLR (outdoor to indoor) is achieved through the incorporation of noise attenuation into the design and construction of a structure.

**NOTES:**

Note 1:

- Although local requirements for on- or off-base housing may require noise-sensitive land uses within Noise Zone II, such land use is generally not recommended. The absence of viable alternative development options should be determined and an evaluation should be conducted locally prior to local approvals indicating that a demonstrated community need for the residential use would not be met if development were prohibited in these zones. Existing residential development is considered as pre-existing, non-conforming land uses.
- Where the community determines that these uses must be allowed, measures to achieve outdoor to indoor NLR of at least 30 decibels (dB) in Noise Zone II should be incorporated into building codes and be considered in individual approvals.

- c. Normal permanent construction can be expected to provide an NLR of 20 dB, thus the reduction requirements are often stated as 10 dB over standard construction and normally assume mechanical ventilation, upgraded sound transmission class ratings in windows and doors, and closed windows year round.
  - d. NLR criteria will not eliminate outdoor noise problems. However, building location, site planning, design, and use of berms and barriers can help mitigate outdoor noise exposure particularly from ground level sources. Measures that reduce noise at a site should be used wherever practicable in preference to measures that only protect interior spaces.
2. Measures to achieve NLR of 25 must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.
  3. Measures to achieve NLR of 30 must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.
  4. Residential buildings require an NLR of 30.
  5. Residential buildings are not permitted.

Table A3.3. Land Use Compatibility for Artillery Explosives.

| LAND USE  |  | SUGGESTED LAND USE COMPATIBILITY |   |                                       |
|-----------|--|----------------------------------|---|---------------------------------------|
| SLUCM NO. | LAND USE NAME  | LUPZ<br>CDNL or<br>CNEL<br>57-62 | Noise Zone II<br>CDNL or<br>CNEL<br>62-70 | Noise Zone III<br>CDNL or CNEL<br>70+ |
| 10        | Residential  |                                  |   |                                       |
| 11        | Household units  | Y <sup>1</sup>                   | N <sup>2,3</sup>                          | N <sup>3</sup>                        |
| 11.11     | Single units: detached   | Y <sup>1</sup>                   | N <sup>2,3</sup>                          | N <sup>3</sup>                        |
| 11.12     | Single units: semidetached   | Y <sup>1</sup>                   | N <sup>2,3</sup>                          | N <sup>3</sup>                        |
| 11.13     | Single units: attached row   | Y <sup>1</sup>                   | N <sup>2,3</sup>                          | N <sup>3</sup>                        |
| 11.21     | Two units: side-by-side  | Y <sup>1</sup>                   | N <sup>2,3</sup>                          | N <sup>3</sup>                        |
| 11.22     | Two units: one above the other   | Y <sup>1</sup>                   | N <sup>2,3</sup>                          | N <sup>3</sup>                        |
| 11.31     | Apartments: walk-up  | Y <sup>1</sup>                   | N <sup>2,3</sup>                          | N <sup>3</sup>                        |
| 11.32     | Apartment: elevator  | Y <sup>1</sup>                   | N <sup>2,3</sup>                          | N <sup>3</sup>                        |
| 12        | Group quarters   | Y <sup>1</sup>                   | N <sup>2,3</sup>                          | N <sup>3</sup>                        |
| 13        | Residential hotels   | Y <sup>1</sup>                   | N <sup>2,3</sup>                          | N <sup>3</sup>                        |
| 14        | Mobile home parks or courts  | Y <sup>1</sup>                   | N <sup>2,3</sup>                          | N <sup>3</sup>                        |
| 15        | Transient lodgings   | Y                                | Y   | N                                     |
| 16        | Other residential  | Y <sup>1</sup>                   | N <sup>2,3</sup>                          | N <sup>3</sup>                        |
| 20        | Manufacturing  |                                  |   |                                       |
| 21        | Food and kindred products; manufacturing   | Y                                | Y <sup>4</sup>                            | Y <sup>4</sup>                        |
| 22        | Textile mill products; manufacturing   | Y                                | Y <sup>4</sup>                            | Y <sup>4</sup>                        |
| 23        | Apparel and other finished products; products made from fabrics, leather, and similar materials; manufacturing | Y                                | Y <sup>4</sup>                            | Y <sup>4</sup>                        |
| 24        | Lumber and wood products (except furniture); manufacturing   | Y                                | Y <sup>4</sup>                            | Y <sup>4</sup>                        |
| 25        | Furniture and fixtures; manufacturing  | Y                                | Y <sup>4</sup>                            | Y <sup>4</sup>                        |
| 26        | Paper and allied products; manufacturing   | Y                                | Y <sup>4</sup>                            | Y <sup>4</sup>                        |
| 27        | Printing, publishing, and allied industries  | Y                                | Y <sup>4</sup>                            | Y <sup>4</sup>                        |
| 28        | Chemicals and allied products; manufacturing   | Y                                | Y <sup>4</sup>                            | Y <sup>4</sup>                        |
| 29        | Petroleum refining and related industries  | Y                                | Y <sup>4</sup>                            | Y <sup>4</sup>                        |
| 30        | Manufacturing (continued)  |                                  |   |                                       |
| 31        | Rubber and misc. plastic products; manufacturing   | Y                                | Y <sup>4</sup>                            | Y <sup>4</sup>                        |
| 32        | Stone, clay and glass products; manufacturing  | Y                                | Y <sup>4</sup>                            | Y <sup>4</sup>                        |
| 33        | Primary metal products; manufacturing  | Y                                | Y <sup>4</sup>                            | Y <sup>4</sup>                        |



| LAND USE |   | SUGGESTED LAND USE COMPATIBILITY |                |                |
|----------|---|----------------------------------|----------------|----------------|
| 34       | Fabricated metal products; manufacturing  | Y                                | Y <sup>4</sup> | Y <sup>4</sup> |
| 35       | Professional scientific, and controlling instruments; photographic and optical goods; watches and clocks          | Y                                | N              | N              |
| 39       | Miscellaneous manufacturing   | Y                                | Y <sup>4</sup> | Y <sup>4</sup> |
| 40       | Transportation, communication and utilities   |                                  |                |                |
| 41       | Railroad, rapid rail transit, and street railway transportation   | Y                                | Y              | Y              |
| 42       | Motor vehicle transportation  | Y                                | Y              | Y              |
| 43       | Aircraft transportation   | Y                                | Y              | Y              |
| 44       | Marine craft transportation   | Y                                | Y              | Y              |
| 45       | Highway and street right-of-way   | Y                                | Y              | Y              |
| 46       | Automobile parking  | Y                                | Y              | Y              |
| 47       | Communication   | Y                                | N              | N              |
| 48       | Utilities   | Y                                | Y              | Y              |
| 49       | Other transportation, communication and utilities   | Y                                | Y              | N              |
| 50       | Trade   |                                  |                |                |
| 51       | Wholesale trade   | Y                                | Y              | N              |
| 52       | Retail trade – building materials, hardware and farm equipment  | Y                                | Y              | N              |
| 53       | Retail trade – including shopping centers, discount clubs, home improvement stores, electronics superstores, etc. | Y                                | Y              | N              |
| 54       | Retail trade – food   | Y                                | Y              | N              |
| 55       | Retail trade – automotive, marine craft, aircraft and accessories   | Y                                | Y              | N              |
| 56       | Retail trade – apparel and accessories  | Y                                | Y              | N              |
| 57       | Retail trade – furniture, home, furnishings and equipment   | Y                                | Y              | N              |
| 58       | Retail trade – eating and drinking establishments   | Y                                | Y              | N              |
| 59       | Other retail trade  | Y                                | Y              | N              |
| 60       | Services  |                                  |                |                |
| 61       | Finance, insurance and real estate services   | Y                                | Y              | N              |
| 62       | Personal services   | Y                                | Y              | N              |
| 62.4     | Cemeteries  | Y                                | Y              | Y              |
| 63       | Business services   | Y                                | Y              | N              |
| 63.7     | Warehousing and storage   | Y                                | Y <sup>4</sup> | Y <sup>4</sup> |
| 64       | Repair services   | Y                                | Y              | N              |
| 65       | Professional services   | Y                                | Y              | N              |
| 65.1     | Hospitals, other medical facilities   | Y1                               | N              | N              |
| 65.16    | Nursing homes   | Y1                               | N              | N              |
| 66       | Contract construction services  | Y                                | Y              | N              |

| LAND USE |  | SUGGESTED LAND USE COMPATIBILITY |   |   |
|----------|--|----------------------------------|---|---|
| 67       | Government services  | Y                                | Y | N |
| 68       | Educational services   | Y1                               | N | N |
| 68.1     | Child care services, child development centers, and nurseries                      | Y1                               | N | N |
| 69       | Miscellaneous Services   |                                  |   |   |
| 69.1     | Religious activities (including places of worship)                                 | Y1                               | N | N |
| 70       | Cultural, entertainment and recreational   |                                  |   |   |
| 71       | Cultural activities  | Y1                               | N | N |
| 71.2     | Nature exhibits  | Y1                               | N | N |
| 72       | Public assembly  | Y1                               | N | N |
| 72.1     | Auditoriums, concert halls   | Y1                               | N | N |
| 72.11    | Outdoor music shells, amphitheaters  | Y1                               | N | N |
| 72.2     | Outdoor sports arenas, spectator sports  | Y                                | N | N |
| 73       | Amusements   | Y                                | Y | N |
| 74       | Recreational activities (including golf courses, riding stables, water recreation) | Y                                | N | N |
| 75       | Resorts and group camps  | Y                                | N | N |
| 76       | Parks  | Y                                | N | N |
| 79       | Other cultural, entertainment and recreation                                       | Y                                | N | N |
| 80       | Resource production and extraction   |                                  |   |   |
| 81       | Agriculture (except live- stock)   | Y                                | Y | Y |
| 81.5     | Livestock farming  | Y                                | N | N |
| 81.7     | Animal breeding  | Y                                | N | N |
| 82       | Agriculture related activities   | Y                                | Y | Y |
| 83       | Forestry activities  | Y                                | Y | Y |
| 84       | Fishing activities   | Y                                | Y | Y |
| 85       | Mining activities  | Y                                | Y | Y |
| 89       | Other resource production or extraction  | Y                                | Y | Y |

**NOTES:**

Note 1: LUPZ- Land Use Planning Zone is a subdivision of Land Use Zone I and functions as a buffer for Noise Zone II. Communities and individuals often have different views regarding acceptable or desirable levels of noise. To address this, some local governments have implemented land use planning measures beyond Noise Zone II limits. In addition to mitigating current noise impacts, implementing such controls within the LUPZ can create a buffer to prevent the possibility of future noise conflicts.

Note 2: Although local requirements for on- or off-base housing may require noise-sensitive land uses within Noise Zone II, such land use is generally not compatible within Noise Zone II. Measures to achieve overall noise level reduction inside structures do not solve noise difficulties outside the structure. Barriers are not effective reducing the noise from artillery and armor, the detonation of either large caliber military munitions or a large quantity of explosives. Additionally, noise level reduction inside structures does not mitigate the vibration generated by the low-frequency energy of large caliber weapons firing and detonations.

Note 3: Within Zones, existing “noise sensitive land uses are considered as pre-existing incompatible land uses. In most cases these uses are not a risk to either mission sustainment or a community’s quality of life. Most long-term members near Army installations or activities acknowledge hearing military operations and activities but they are usually not alarmed or bothered by the noise.

Note 4: Although noise levels may be compatible, caution should be exercised in siting any activity which may be sensitive to vibration.

## ATTACHMENT 4

### GEOSPATIAL DATA

**A4.1. General.** The AICUZ program is heavily reliant on geospatial data when it comes to analyzing the compatibility of land uses and mission activities. Most of the AICUZ area of influence lies outside the installation and will require the acquisition and use of geospatial data that comes from external sources, as well as Air Force generated geospatial data layers.

A4.1.1. The Air Force has developed a suite of AICUZ geospatial data layers, map templates, and guidance to support enterprise program management and analysis (i.e. graduated noise levels, incompatible land use, real property interests, and safety hazards). Other AICUZ geospatial data layers are generated externally. The standardized AICUZ data and map templates enable simple to complex queries from the tactical to the strategic level in desktop – to – enterprise applications and facilitate integration into broader more complex enterprise planning and analysis applications and scenarios. All geospatial data used in support of the AICUZ program must adhere to the latest AICUZ geospatial model as maintained by Air Force GeoBase Program and AFCEC/CP.

**A4.2. AICUZ geospatial data layers created by the Air Force or its contractors.** Layers are available in a point (\_P), line (\_L), and/or polygon (\_A) formats.

A4.2.1. Historic, Current, and Planning aspects of the DNL/CNEL noise contours-plotted in 5 dB increments starting with 65 dB DNL and going to 80 dB. May start at 60 dB in some locations. NoiseZone A and NoiseZone L - An area (or the external boundary of an area) describing the sound levels attributed to a noise source. The following descriptions come the naming convention provided by the OSD Defense Installation Spatial Data Infrastructure (DISDI) office.

A4.2.2. Historic and Current aspects of the CDNL noise contours plotted in the following increments 57-62 dB CDNL, 62-70 dB CDNL, and 70+ dB CDNL. NoiseZone\_A and NoiseZone\_L - An area (or the external boundary of an area) describing the sound levels attributed to a noise source.

A4.2.3. Historic Peak and Current Peak Noise Contours for Small Arms Ranges: two contours, 87-104 dB Peak, and >104 dB Peak. NoiseZone\_A and NoiseZone\_L - An area (or the external boundary of an area) describing the sound levels attributed to a noise source.

A4.2.4. Safety zones, to include Clear Zones, APZs I and II. AirAccidentZone\_A - Areas at the end of runways or beneath approach and departure flight paths where there is a higher potential for aircraft accidents. These areas include clear zones, and accident potential zones (APZ) I and II. Clear zones are areas immediately beyond the end of the runways with a high potential for accidents. The clear zones are traditionally acquired by the Government in fee or controlled through restrictive easements so they are clear of both vegetation and development. All of these zones are included in the analysis of land use compatibility with surrounding communities.

A4.2.5. Hazards to Aircraft Flight Zone (defined by the airfield imaginary surfaces). AirfieldImaginarySurface\_A - The hypothetical surfaces above and around an airfield where there are height restrictions that prohibit obstructions to navigable airspace. These surfaces include approach zones, transition zones, etc.

A4.2.6. Any approved Line of Sight/Look Angle Zone. RadarEquipment\_A and RadarEquipment\_P – These layers will give the location of equipment used for determining the presence and position of an object by measuring the direction and timing of electromagnetic waves.

A4.2.7. Non-Conforming Uses with Airfield Criteria-location of obstructions within the HAFZ. AirfieldObst\_P - Features whose height intrudes into navigable airspace (SOURCE 2.6 BROWSER).

A4.2.8. Primary flight tracks to include departure, arrival and closed pattern. MilFlightTrack\_L – Flight paths in and out of the airfield traffic area on the installation. MilTrainingRoute\_L – Layer contains Low level military training airspace. Flights Regulations governing the airspace are conducted under either Instrument Flight Rules (IFR) or Visual Flight Rules (VFR). The airspace is classified as (IFR) Military Training Routes (IR), VFR Military Training Routes (VR), or Slow Speed Military Training Route (SR). This Feature Class represents the turn point and the ends of the edges of each segment within the route based on the AP/1B published by the National Geospatial-Intelligence Agency (NGA). MilLocalFlying\_A - Airspace in the local area to an installation that supports routine, training activity. These areas are normally developed in conjunction with local FAA controllers and airspace managers and are de-conflicted with other airspace such as Class B, C, or D airspace or Special Use Airspace (SUA). Note: These areas are separate from Special Use Airspaces (SUA) and Military Training Routes (MTR).

A4.2.9. Real Property Interests- restrictive use easements/aviation easements. LandUseControl\_A - Locations where land use is restricted due to environmental restoration or compliance purposes.

A4.2.10. Development proposals reviewed by the base. FutureProjects\_A and FutureProjects\_P – Locations used to represent tasks or activities that are designated to occur at a later date.

A4.2.11. Existing incompatible land uses within the Clear Zones and APZ I and II. IncompatibleLandUse\_A - current or future specific land use deemed to be incompatible based on an analysis of the relationships between aircraft operational effects, including but limited to noise contours, accident potential zones, and/or height restrictions, and the land use.

### **A4.3. Externally Generated AICUZ geospatial data layers include:**

A4.3.1. Current Zoning Map-used for land use compatibility analysis in the AICUZ study. LocalGISDataAreas - Placeholder for local GIS/geospatial data. Local data in this map may include, but is not limited to, locations of approved and/or executed building permits for construction; the boundaries of neighborhoods, housing subdivisions, and housing communities within 10 miles of the installation complex; and land sales. Keep the data in its native format and provide documentation for the source of the data, contact information, and battle rhythm for updates so the latest version can be downloaded as revisions are made by the data steward.

A4.3.2. Current Land Use Map- used for land use compatibility analysis in the AICUZ study. LandUse\_A - The way land or water is developed and used in terms of the types of activities allowed (e.g., airfields, farming, buildings, forest, hunting, recreational, etc.).

A4.3.3. Future Zoning Map- used for land use compatibility analysis in the AICUZ study. LocalGISDataAreas - Placeholder for local GIS/geospatial data. Local data in this map may include, but is not limited to, locations of approved and/or executed building permits for construction; the boundaries of neighborhoods, housing subdivisions, and housing communities within 10 miles of the installation complex; and land sales. Keep the data in its native format and provide documentation for the source of the data, contact information, and battle rhythm for updates so the latest version can be downloaded as revisions are made by the data steward.

A4.3.4. Future Land Use Map- used for land use compatibility analysis in the AICUZ study. FutureProjectsLandUse\_A - The location where a proposed use of land and/or water has been made, but a project has yet to be created.

A4.3.5. Local planning area maps-used to facilitate conversations with local planning department. LocalGISDataAreas - Placeholder for local GIS/geospatial data. Local data in this map may include, but is not limited to, locations of approved and/or executed building permits for construction; the boundaries of neighborhoods, housing subdivisions, and housing communities within 10 miles of the installation complex; and land sales. Keep the data in its native format and provide documentation for the source of the data, contact information, and battle rhythm for updates so the latest version can be downloaded as revisions are made by the data steward.