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

*AIR FORCE HANDBOOK 32-7084*
*1 MARCH 1999*

*Civil Engineer*

# *AICUZ PROGRAM MANAGER'S GUIDE*



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Pages: 123/Distribution: F

This handbook provides MAJCOM and base level Commanders and managers an overview of the Air Force's AICUZ Program. The AICUZ Program Manager's provides specific guidance concerning the organizational tasks and procedures necessary to implement the AICUZ program. It is written in a "how to" format to guide a person through the five phases of an AICUZ study. It also includes a generic AICUZ Study Report, Citizen Brochure, and a Implementation and Maintenance Plan. The guide summarizes the data collection steps and procedures for developing USAF-approved noise contours. This publication aligns with AFI 32-7063.

## Chapter 1

## AICUZ OVERVIEW

**1.1. Introduction.** The Air Installation Compatible Use Zone (AICUZ) Program is a Department of Defense (DoD) planning program which was developed in response to growing incompatible urban development (encroachment) around military airfields. The Air Force AICUZ program policy is to promote compatible land use through participation in local, regional, state and federal land use planning control and coordination processes.

**1.1.1.** Most Air Force installations were built in the 1940's and early 1950's and in relatively remote areas. Since then, urban growth has extended toward the boundaries of many of these installations. Problems result when complaints over the effects of aircraft operations (e.g. noise, low overflight, etc.) lead to operational changes which negatively impact the flying mission. Incompatible encroachment has been a contributor to the cessation of flying mission and base closures at installations such as Lowry AFB in Colorado, Chanute AFB in Illinois, and Laredo AFB in Texas.

**1.1.2.** As communities grow and expand, it is only natural that they become more interested in orderly development. This should include adequate provisions to protect the Air Force facilities which are an integral part of the communities physical and economic structure.

**1.1.3.** The Air Force has been successful in encouraging the adoption of enabling legislation for planning compatible development around airfields in Arizona, Texas, 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 state enabling legislation for this purpose, and will cooperate with the appropriate authorities regarding its implementation.

**1.2. Program Objectives.** The AICUZ program has two objectives. First to assist local, regional, state and federal officials in protecting and promoting the public health, safety, and welfare by promoting compatible development within the AICUZ area of influence. Then To protect Air Force operational capability from the effects of land use which are incompatible with aircraft operations.

**1.2.1.** The AICUZ study must be consistent with current land use planning principles and procedures as well as current techniques in noise assessment methodology. Also, it must adequately describe current air operations and procedures and provide recommendations for compatible land use development based on nationally recognized standards. In some cases, projections for future air operations are included in the AICUZ study if the community requests it. The inclusion of future projections in the AICUZ must avoid releasing new information scheduled to be released through the Environmental Impact Analysis Process (EIAP). If future projections are planned to be included, approval from the MAJCOM/CE is required. 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 land use determinants used by local planners and decision makers. The AICUZ study must have a factual and rational basis.

**1.3. Regulatory Basis.** Several documents provide the regulatory basis for the AICUZ program:

**1.3.1.** DoD Instruction 4165.57 establishes and requires the military departments to develop, implement, and maintain an AICUZ program for installations with flying operations. This DoDI:

**1.3.1.1.** Sets forth DoD policy on achieving compatible use of public and private lands in the vicinity of military airfields,

**1.3.1.2.** Defines (a) required restrictions on the uses and heights of obstructions in the vicinity of air installations to provide for safety of flight and to assure that people and facilities are not concentrated in areas susceptible to aircraft accidents, and (b) desirable restrictions on land use to assure its compatibility, with the characteristics, including noise, of air installations operations,

**1.3.1.3.** Describes the procedures by which the AICUZ may be defined, and

**1.3.1.4.** Provides policy on the extent of Government interest in real property within those zones which may be retained or acquired to protect the operational capability of active military airfields (subject in each case to the availability of required authorizations and appropriations).

**1.3.2.** The General Services Administration (GSA), Federal Management Circular (FMC) 75-2 entitled "Compatible Land Uses at Federal Airfields" requires federal agencies that operate airfields to work with local, regional, state, and other federal officials on compatible land use planning. It requires other federal agencies to ensure their programs serve and foster compatible land use according to plans (such as AICUZ) developed by the federal agency operating an airfield. It requires HUD, VA, FHA and other Federal agencies to implement the AICUZ program as they are able under their mandate.

**1.3.3.** AFI 32-7063, "Air Installation Compatible Use Zone (AICUZ) Program" sets forth the policy, responsibilities, and requirements of the program. Topics covered include program objectives, responsibilities, land use compatibility guidelines, and AICUZ studies and updating.

**1.3.4.** AFJM 32-8008 (formerly AFM 86-14), "Airfield and Heliport Planning Criteria" provides standardized criteria for all DoD service components for planning and developing the layout of runways, taxiways, aprons, and related facilities for airfields and heliports. It provides criteria for establishing planes and surfaces of navigational airspace surrounding the airfields and heliports for the purpose of controlling potential obstructions to aircraft operations.
**1.3.5.** AFMAN 32-7067 (formerly AFM 19-10), "Planning in the Noise Environment" is a Tri-Service manual which discusses noise characteristics, noise sources, effects of noise, noise monitoring, tools for noise analysis and reducing noise conflicts.
**1.3.6.** AFI 13-201, "Air Force Airspace Management" establishes practices to decrease disturbances from flight operations that might cause adverse public reaction, and provides flying unit commanders with general guidance for dealing with local problems. This instruction sets forth the AICUZ responsibilities of the flying operation organizations at Air Force installations.

**1.4. Evolution of the AICUZ Program.** The military services, particularly the Air Force, have been advocates of noise planning for a long time. Many aspects of the noise program presently used for civilian airports have their roots in the Air Force's experiences.
**1.4.1. Background.** As early as 1957, the Air Force began establishing 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 at that early time, the Air Force recognized the need to address noise from a land use planning perspective. The Air Force's major concern is the threat posed to the flying mission at an installation as a result of incompatible development.
**1.4.1.1.** The late 1960's and early 1970's was 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 1960's, FAA's civilian aircraft certification in 1969, the National Environmental Policy Act in 1970, and the Noise Control Act in 1972. These efforts only served to increase the awareness of the military on noise planning issues and to provide the basis for institutionalizing its programs.
**1.4.1.2.** In 1971, the Greenbelt concept was initiated by the Air Force to address the growing problem of incompatible development around airfields (encroachment). The idea behind "Greenbelt" was to establish a buffer zone around the installation through the purchase of property. For obvious budgetary considerations, this concept proved to be economically infeasible.
**1.4.2. Noise Description.** 1973 marked the year the AICUZ program, as it is known in the Air Force, was implemented. The Air Force adopted the NOISEMAP computer program to describe noise impacts created by aircraft operations. NOISEMAP is one of two EPA approved programs. The other is the Integrated Noise Model (INM) which is used by the FAA for civilian airports. The Air Force continues to improve the NOISEMAP program.
**1.4.2.1.** 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 refers to the average sound level exposure, measured in decibels, over a 24 hour period. A 10 decibel penalty is added to sound levels for operations occurring during the hours of 10 PM to 7 AM. This penalty is applied due to the increased annoyance created by noise events which occur during this time. DNL is a quantity that can be calculated directly at a specific location. In 1974, the Administrator of the EPA, under authority in the Noise Control Act of 1972 recommended to all federal agencies adoption of the DNL noise descriptor system. The Air Force and EPA agreed upon an implementation procedure by which all future AICUZ studies would be prepared in DNL.
**1.4.2.2.** The development of DNL was an important milestone in the AICUZ program. It provides a single descriptor for the noise level. This reduced confusion, increased credibility and allowed for comparative research efforts on the effects of noise. More details on the DNL concept are presented in Attachment 2.
**1.4.3. Height Restrictions.** Another aspect of the AICUZ program which is paralleled in the civilian community is the height obstruction criteria. U.S. standard instrument approach and departure procedures (Joint Air Force, Navy, Army, and FAA Criteria Handbook - AFM 55-9) prescribes flight path area and vertical clearances from terrain and manmade obstructions. The restrictions limit the height of buildings and other structures in the vicinity of the airfield in order to ensure the safety of pilots, aircraft and individuals and structures on the ground. AFJM 32-8008 provides more details on the height restriction criteria.
**1.4.4. Accident Potential Zones.** Accident Potential Zones (APZs) are one aspect of the AICUZ program where military application differs from civilian airfields. 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 (CZ), Accident Potential Zone I (APZ I), and Accident Potential Zone II (APZ II). The majority of these accidents (62%) occurred either on or adjacent to the airfield or within the CZ, while only about 8% occurred in APZ I and 5% in APZ II. It was concluded that the CZ warranted special attention due to the high incident of accident potential that severely limited acceptable land uses. The Air Force has spent approximately $65 million to acquire real property interests within the clear 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. The Air Force recommendation is to limit the number of people exposed through selective land use planning. Attachment 3 provides more detail on accident potential.

**1.4.5. Land Use Guidelines.** Most complaints are related to noise generated by aircraft operations. Noise around an airport is a fact of life, however, as aircraft operations increase the noise exposure increases and complaints increase with demands for noise reductions. In most cases, noise reduction is accomplished by restricting airfield or aircraft operations.

**1.4.5.1.** The Federal Interagency Committee on Noise (FICON), published "Guidelines for Considering Noise in Land Use Planning and Control" in June 1980. The committee, now called FICAN (Federal Interagency Committee on Aircraft Noise) is made up of representatives from federal departments that include Transportation, Defense, Environmental Protection Agency, Veterans Administration, and Housing and Urban Development. The purpose of these guidelines is to encourage the best land use, consistent with community planning objectives, while minimizing exposure to excessive noise levels. Table A4.1, "Air Force AICUZ Land Use Compatibility with respect to Noise and Accident Potential" in Attachment 4, contains the official Air Force recommendations on land use within these zones.

**1.4.6. Noise Reduction Efforts.** Military and civilian noise planning efforts have benefited from mutual interest and efforts. 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 engine test facilities, or hush houses, where engines can run at full power with dramatically reduced noise effects to the surrounding environment. Noise abatement procedures are also practiced in Air Force flight scheduling and aircraft operating procedures. Modifications to flight tracks, imposition of quite hours and use of preferential runways are all techniques used by both the military and civilian airfields to reduce noise. At most installations, Air Force noise reduction efforts have been used to their maximum degree, and land use planning and controls are the answer for further protection of the community.

**1.4.7. Conclusion.** In summary, the differences between noise concerns for the military and the civilian sector continue to decrease. The exchange of technical noise information and assistance is needed to address and solve similar problems. Requests from the civilian side to jointly use military airfields are increasing. The Air Force presently has several joint use airfields. Air National Guard and Air Force Reserve units operate from several major commercial airports across the country. There are also large scale joint service operations that include activities at civilian airports. Therefore, both civilian and military airfield operators need to understand each other's mission requirements and their implication with regard to noise and land use planning.

**1.4.7.1.** The overall goal of the Air Force AICUZ program is to reduce people's exposure to high levels of aircraft noise and accident potential through compatible land use controls adopted by the local communities. To this end, the Air Force initiated a program to assist local communities in implementing AICUZ recommendations. This program is called the Joint Land Use Study (JLUS) program and is described in Chapter 2. Meanwhile, the Air Force must continue to provide the public with current information which will assist them in making prudent land use decisions, and work cooperatively together to resolve the problems of growth and encroachment.

## Chapter 2

## THE FIVE PHASES OF AN AICUZ STUDY

**2.1. Introduction.** This chapter describes in detail the five phases or steps for preparing an AICUZ study. The five phases to prepare an AICUZ study are:

Phase I: Data Collection and Analysis
Phase II: Data Review and Validation
Phase III: Preparation of AICUZ Report or Amendment
Phase IV: Public Release of AICUZ Report or Amendment
Phase V: AICUZ Implementation and Maintenance

**2.1.1.** The five-phase AICUZ process is ongoing. Nearly all air installations have completed and released initial AICUZ studies, although some installations remain exempt due to minimal flying operations or having a DNL 65 noise contour which does not extend beyond the installation's boundaries. Duties of the installation AICUZ Program Manager include preparing and releasing updated AICUZ studies. The AICUZ data validation process occurs every two years or as part of the NEPA process.

**2.1.2.** An accurate AICUZ study requires the full support and participation from all installation functions including the Installation Commander, Civil Engineering, Bioenvironmental Engineering, Legal Office, Public Affairs, Base Operations, the flying wings, Air Traffic Control, Aircraft Maintenance, Safety, Weather, Comptroller, and other appropriate functional areas. The installation Environmental Protection Committee (EPC) coordinates the AICUZ process. 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. These shared responsibilities are described in Chapter 3 as well as in AFI 32-7063 and AFI 13-201.

### 2.2. Phase I -- Data Collection and Analysis.

**2.2.1. Procedure for Data Collection.** The AICUZ Program Manager is primarily responsible for coordinating the collection of AICUZ data and ensuring an accurate data package is used in the preparation of the noise contours. Chapter 4 of this handbook describes in detail how to collect and format the data, personnel to contact, and the responsibilities of specific Air Force personnel at installation level and higher headquarters. Once the data has been validated, the noise contours can be produced using the computer noise modeling program, NOISEMAP. During the preparation of the noise contours, the level of change in the AICUZ noise contour is analyzed, thereby determining the level of update required.

**2.2.1.1.** The AICUZ Program Manager should ensure the flight operational data obtained for the preparation of the noise contours is a reasonable and accurate description of the flight operations at the airfield. The data collection process covers both military and civilian aircraft activities at the airfield. The operations of aircraft assigned to the installation as well as transient aircraft operations occurring at the installation should be taken into consideration. Throughout the data collection process, a number of sources are contacted for information on operations of the assigned and transient aircraft. Sources of this information include Air Traffic Control, flying organizations, base operations, flight schedules, and unit logs.

**2.2.1.2.** The AICUZ Program Manager reviews the AICUZ operational and maintenance data at least once every two years or as part of an Environmental Impact Analysis Process (EIAP) evaluation. This review is required to determine the need for an AICUZ update. By 1 July (each even year), each MAJCOM/CE must complete the biennial AICUZ Status Survey (RCS: HAF-CEV (BE) 9426) containing an AICUZ status update and review schedule for the next two years for each installation having an AICUZ requirement, as called for by AFCEE/EC. Each Base Civil Engineer (following EPC coordination) must send the MAJCOM/CE either updated data on aircraft operations or a statement indicating the data used for the current published AICUZ study or amendment is still valid. The MAJCOM/CE must send AFCEE/EC updated operational and maintenance data on each installation in the major command or notification indicating current data is still valid.

**2.2.1.3.** The installation AICUZ Program Manager, MAJCOM/CE and AFCEE/ECC maintain and update the AICUZ file and any historic documentation. Policy requires most AICUZ data and information be permanently retained. AFMAN 37-139, *Records Disposition--Standards*, includes regulations applicable to AICUZ file retention.

**2.2.2. The Noise Screening Method.** The threshold for AICUZ updating actions is a change in Day-Night Average Sound Level (DNL) of 2 dB or more in a noise sensitive or controversial area from the last publicly released noise exposure map. The noise modeling computer program, NOISEMAP, determines if the dB threshold has been exceeded at selected critical locations. Appropriate data on aircraft operational changes should be prepared in accordance with Chapter 4 of this Handbook. Collect the data and process in NOISEMAP on an annual basis, if possible, but at least every two years, or as required by EIAP. The NOISEMAP processing will determine if the 2 dB threshold has been exceeded.

**2.2.3. Land Use Issues.** The installation AICUZ Program Manager or Base Community Planner is responsible for maintaining current land use information. This information is derived from an analysis of all projects affecting land use

within the AICUZ. An evaluation should be made of incompatible land use and population in the AICUZ to determine if encroachment may affect the existing mission. The encroachment could impact both operational procedures and flight tracks. Below are the descriptions or analyses:

Existing land use in the AICUZ environs.
Existing zoning in the AICUZ environs.
Population within the noise contours in the AICUZ environs
Future land use in the AICUZ environs.
Planned developments in the AICUZ environs.
Incompatible land use in the AICUZ environs.

**2.2.3.1. Existing Land Use and Zoning.** The installation planner should update the existing land use and existing zoning maps used in the previously published AICUZ study or amendment. Existing land use is defined as the pattern and type of actual development. The planner should obtain existing land use maps and reports from the local government agency. Where local government maps are not available, the AICUZ program manager must develop the existing land use maps. This may be accomplished by performing a ground survey and sketching existing land uses on a base and/or area maps or by using aerial photography or other imagery to define land uses. In addition, existing zoning information (i.e., maps and ordinances) and population within the noise contours should be obtained. Existing zoning may not be the same as actual development. It represents what is currently permitted to be developed. It is important to obtain the full zoning ordinance for both evaluation and reference.

**2.2.3.1.1.** The planner should obtain copies of the local ordinances, subdivision regulations, building codes, planned unit development ordinances, etc. Furthermore, background reports or any documents describing existing conditions within the community, which seem relevant to the broad purposes of AICUZ, such as planning background studies, school surveys, economic reports, etc., should be obtained. Information on land ownership may also be useful. In addition, the planner should conduct a visual survey of the area (i.e., take a drive) to identify new activity not in current maps or plans.

**2.2.3.1.2.** Maps or reports of the following data may also be useful: soils, topography, flood plain maps, hydrology, surficial geology, physiographic features, other ecological data, and census or other demographic data.

**2.2.3.1.3.** For mapping purposes and to facilitate analysis for the AICUZ, the land use categories typically included in an AICUZ document are:

**2.2.3.1.3.1. Residential**: This category includes all types of residential activity, such as single and multi-family residences and mobile homes, at a density greater than one dwelling unit per acre.

**2.2.3.1.3.2. Commercial**: This category includes offices, retail, restaurants and other types of commercial establishments.

**2.2.3.1.3.3. Industrial**: This category includes manufacturing, warehousing, and other similar uses.

**2.2.3.1.3.4. Public/Quasi-Public**: This category includes publicly owned lands and/or lands to which the public has access, including military reservations and training grounds, public buildings, schools, churches, cemeteries, and hospitals.

**2.2.3.1.3.5. Recreational**: This category includes land areas designated for recreational activity, including parks, wilderness areas and reservations, conservation areas, and areas designated for trails, hikes, camping, etc.

**2.2.3.1.3.6. Open/Agriculture/Low Density:** This category includes undeveloped land areas, agricultural areas, grazing lands and areas with residential activity at densities less than or equal to one dwelling unit per acre.

**2.2.3.1.3.7. Miscellaneous:** In addition to the above designations of land uses, the AICUZ document identifies important complexes within the AICUZ, such as hospitals, schools, coliseum, or other areas identified by the installation.

**2.2.3.1.4.** Once the above maps have been obtained, an updated narrative summary of existing land use and zoning should be prepared for the AICUZ area. This discussion should include, but not be limited to, the following: The location of major developments, cities, or towns with respect to the installation. A review of the existing land uses by category (e.g., residential, commercial, industrial, etc.) and a general description of their location within the AICUZ. A review of the zoning map and zoning changes (if applicable). This review should compare the amount of land zoned with the actual amount of land within the AICUZ. In addition, significant zoning changes should be reviewed.

**2.2.3.1.5.** When reviewing local ordinances, some of the items to look for are:

**2.2.3.1.5.1. Planned Unit Development Ordinances** (may also be known as Planned Residential Development, Planned Commercial Districts, or Cluster Zoning): These ordinances look at a development as being a single entity rather than a collection of individual lots. In contrast to standard zoning, there are very few requirements for minimum lot dimensions, rear yard size minimums, etc. Requirements are geared more towards the quality of the spaces, how usable yards are rather than how big, and the dedication of open spaces and facilities for community use.

**2.2.3.1.5.2. Site Plan Review Process:** In the zoning ordinance, each development proposal is carefully scrutinized by the planning staff on the basis of an expanded set of criteria. This allows the community greater control over certain uses. Rather than set forth a "recipe" supposedly satisfying all situations, the planning board treats each development as a unique project to be evaluated individually.

**2.2.3.1.5.3. Bonus and Incentive Plans:** A community attempting to improve the quality of development in the area may implement a bartering system with developers. For instance, the community may relax density regulations (permitted number of dwelling units per acre), if the developer provides playgrounds.

**2.2.3.1.5.4. Use of Performance Standards Rather Than Specifications:** This can evidence itself in building codes as well as other regulatory ordinances. For example, a performance specification could require all interior water pipes be copper and two inches in diameter. In contrast, a performance standard could require all interior pipes be capable of handling a specific water pressure, whether they be copper and two inches in diameter or plastic and 1 1/2 inches in diameter.

**2.2.3.1.5.5. Historical Trends**, of items reviewed above, should be discussed.

**2.2.3.1.5.6. Summary Tables** should be included.

**2.2.3.2. Future Land Use.** A future land use map will be developed. The main source for data is the local planning or zoning commission. Other data should be available from appropriate agencies (i.e., school board, chamber of commerce, water district, etc.). At the regional level, Councils of Government or regional planning commissions should be able to provide necessary data. Data for state plans should be obtained from the appropriate state agency. In addition, the following data may be obtained:

**2.2.3.2.1. Local Comprehensive Plans:** Maps and reports are available. The planner should obtain maps of sufficient detail and scale to provide useful information. If area-wide maps of sufficient detail are not available, determine whether sub-area plans have been or are being developed.

**2.2.3.2.2. Regional Comprehensive Plans:** Maps and reports are available. In many cases, comprehensive plans are prepared by a jurisdictional regional body such as a council of governments or a regional planning commission. Alternatively, the regional body may prepare the area-wide plans and the local jurisdiction may prepare the sub-area plans.

**2.2.3.2.3. Other Local Plans:** Maps and documents are available. Examples include housing, population, economic base, income and employment studies, utility plans, transportation plans, school and other capital improvement programs, etc. These plans will cover the various elements comprising the infrastructure necessary for the future community. Because they often contain short-term programs as well as long-range plans, these plans should reflect growth patterns clearly.

**2.2.3.2.4. Other Regional and State Plans:** Maps and documents can be obtained. Any community may have elements partially controlled or impacted by the actions of state or regional agencies. Example agencies include the highway departments, parks and recreational departments, coastal zone management, water management, etc. These state or regional agencies should be contacted for maps or plans relating to the AICUZ area.

**2.2.3.2.5.** Once this information has been obtained and analyzed, land use categorization within the AICUZ area can be determined based on the land use categories described in section 2.2.3.1. An updated land use map can then be developed.

**2.2.3.2.6.** The next step is to create an updated analysis on future land use. As a baseline, the planner can use the Future Land Use Analysis in the previously published AICUZ study or amendment. The analysis should include a summary of the future land use and development plans for the jurisdictions surrounding the installation. Local jurisdictions to survey are: municipalities, counties or parishes, regional councils, EO 12372 designated agencies and single points of contact, special districts (schools, sewer, water, fire, flood control, soil conservation, etc.), and utility companies. The Directory of State Environmental Planning Agencies lists and describes state agencies to contact. Also see Appendix A-4 of Volume II, *Interim Environmental Planning Bulletin 14*. Volume II of *Interim Environmental Planning Bulletin 15* contains guidance for surveying federal agency plans. The Future Land Use Analysis should discuss the following for each jurisdiction surrounding the installation:

**2.2.3.2.6.1.** An assessment of the realistic expansion of municipal services to undeveloped areas.

**2.2.3.2.6.2.** An assessment of the geophysical characteristics influencing growth. These include wetlands and flood plains.

**2.2.3.2.6.3.** A review of general determinants influencing area growth, such as economic development, completion of proposed highways, and general marketability of the area.

**2.2.3.2.6.4.** Plans for designation of open space or recreation areas near the installation.

**2.2.3.2.6.5.** An assessment of the impact the installation has on the community's rate of growth.

**2.2.3.3. Land Use Compatibility Narrative Analysis.** Once the planner has updated the zoning and land use maps, the next step is to prepare the Land Use Compatibility Narrative Analysis using the analyses developed in the previously released AICUZ as the baseline. Existing operations, future operations, existing civilian community, and future civilian community are four main elements to consider when analyzing land use in the AICUZ vicinity.

**2.2.3.3.1.** The review and analysis of these four elements are essential in evaluating opportunities to reduce noise exposure and propose usable recommendations to communities. Information on existing and future aircraft operations and installation configurations are available within the Air Force. Land use information must be obtained from civilian sources. AICUZ activities must anticipate and respond to the pressures and thrusts of the civil community. This can only be accomplished by identification and analysis of both existing and future operations and existing and future land use. Using the updated existing land use, existing zoning, and future land use maps, the degree and nature of existing and future incompatible and conditionally incompatible land uses should be thoroughly discussed. Subjects to be addressed are:

**2.2.3.3.1.1.** What are the determining land use factors?
**2.2.3.3.1.2.** What are the future land use alternatives?
**2.2.3.3.1.3.** How can the future land use be directed or redirected?
**2.2.3.3.1.4.** Who decides the future land use pattern?
**2.2.3.3.1.5.** What actions has the Air Force taken to reduce conflicts? What actions by the community?
**2.2.3.3.1.6.** What can the Air Force do to reduce incompatible land uses?
**2.2.3.3.1.7.** What recommendations should be made to other government agencies?
**2.2.3.3.2.** Wyle Research Report, WR 89-7, "Guidelines for the Sound Insulation of Residence Exposed to Aircraft Operations" is a study which provides improved methods for attaining noise level reductions for various structures mitigating impacts of high aircraft noise levels.

**2.3. Phase II -- Data Review and Validation.** The Air Installation Compatible Use Zone program, like any successful activity, is dependent on the quality, accuracy, and completeness of its database. A program like AICUZ requires more comprehensive treatment than others because the data may be used for plans that could eventually be translated into local law or ordinances. There is also the possibility the data could be challenged in a court of law. Phase II provides the quality assurance the AICUZ program requires.
**2.3.1. Objective.** The purpose of Phase II of the AICUZ program is to provide quality assurance for data collected during Phase I. During Phase II, the major command reviews the Phase I data package for adequacy. Data packages will vary from installation to installation. A comprehensive review helps to identify and correct deficiencies before they are publicly released. In some portions of the program, a significant degree of judgment must be exercised, particularly in the analysis of land use compatibility. The analysis one installation submits may be adequate, while the same level of effort would be unacceptable from another. Judgment should be based on an appraisal of the local situation. In addition to determining the content and quality of Phase I data, Phase II offers the opportunity to identify instances where major command assistance is required. Comprehensive land use planning is conducted throughout the phases of an AICUZ study. Errors or omissions in Phase I can easily compromise subsequent phases.
**2.3.2.** There are five basic procedures in Phase II: First determine if all elements of Phase I have been completed. Second review the nonoperational data elements in detail. Third review the flight and maintenance data elements in detail. Fourth correct errors and augment insufficient data. Finally review results of item 4.
**2.3.2.1. Review of Phase I for Completion.** Using guidance from Chapter 4 of this Handbook and comparing previous studies, the Major Command should review and evaluate each element of the submitted package. Table 2.1 can be used as a guide to determine if all elements of Phase I have been completed:

**Table 2.1. Items Completed During Phase I.**

| Organization | Responsibilities |
|---|---|
| Commander (CC) | Establish Team |
| Base Civil Engineer (CE) | Existing land use analysis<br>Existing zoning analysis<br>Future land use analysis<br>Incompatible land use analysis |
| Deputy Commander for Operations (DO) | Operational data collection/validation |
| Deputy Commander for Maintenance (LG) | Maintenance data collection/validation |
| Staff Judge Advocate (JA) | State land use legislation<br>Local land use regulation<br>Legal land use issues (court decisions) |

**2.3.3.** Installations have been granted exemptions from the AICUZ program when the data collection and analysis resulted in noise levels that did not extend beyond Air Force boundaries. Installations have received exemptions when fewer than 10 jet or 25 propeller aircraft operations occur per day. Some installations that released AICUZ studies in the past have since received waivers allowing them to suspend AICUZ activities. However, having an AICUZ exemption or waiver does not permanently end an installation's AICUZ responsibilities. At least every two years, or whenever an Environmental Impact Analysis Process occurs, or if a number of small operational changes cumulatively exceed the 2 dB threshold, an installation with an AICUZ waiver should be reevaluated, to determine if the criteria used to establish the waiver remain valid. If the waiver criteria are no longer valid, the installation must initiate Phase I AICUZ data collection.

**2.4. Phase III--Preparation of AICUZ Report or Amendment.** Phase III of the AICUZ program includes the preparation of the final AICUZ report or amendment including production of all maps.

**2.4.1.** During Phase II, the major command has already reviewed and approved the operational and maintenance data used to generate the noise footprint. If a new AICUZ is required, the final map graphics are produced for inclusion in the AICUZ report. Zoning and land use overlays must also be completed using background maps overlaid with noise contours and accident potential zones. These maps must be professionally reproduced using a minimum of two colors to distinguish the contour lines from lines on the background map.

**2.4.1.1.** While final AICUZ maps are being prepared, the Base Civil Engineer initiates preparation of the AICUZ Study and the Implementation and Maintenance Plan (IMP). Other installation offices such as comptroller, procurement, and special services assist in preparing the study or amendment. The Public Affairs and Legal Offices assist the Base Civil Engineer in preparing the AICUZ IMP.

**2.4.1.2.** The Base Civil Engineer coordinates these documents through the Environmental Protection Committee (EPC), Legal Office, and Public Affairs in accordance with the guidance in this Handbook and any additional specific guidance issued by the major command. The major command must approve all documents prior to any public involvement or release.

**2.4.2. The AICUZ Study.** Each installation with an active, Air Force owned and operated runway (see paragraph 2.4.4 for joint use installations) prepares, publicly releases, and maintains an AICUZ study defining, and mapping aircraft noise levels and accident potential areas around the installation. All operations, including those on secondary runways, must be evaluated in these operational studies. An installation may receive an exemption if the AICUZ does not extend beyond the installation boundaries or if fewer than 10 jet or 25 propeller-driven aircraft operations occur per day at the installation.

**2.4.2.1.** An AICUZ study typically reflects current aircraft operations at an installation. An AICUZ study may contain noise contours based upon flying operations which are proposed in an approved Environmental Assessment (EA) or Environmental Impact Statement (EIS). Environmental documentation approval is defined as an EA for which a Finding of No Significant Impact (FONSI) has been executed or an EIS for which a Record of Decision (ROD) has been executed. Under certain circumstances, in cooperation with local communities and with approval from MAJCOM/CE, long range contours based upon true expansion potential of the installation may be included as part of an AICUZ study. Many factors may go into long range noise contours including but not limited to: likely aircraft types, available apron area for expansion, and mission and operational needs. To ensure realism in developing these future noise contours, the installation AICUZ Program Manager must work closely with MAJCOM, Base Operations, Operations Group, Air Traffic Control, Airspace Management, and Logistics Group. Future noise contours must contain a statement indicating the projected nature of the contours. In every case where future noise contours are included in an AICUZ study, the study must also include noise contours for current flying operations or flying operations from an approved EIAP document in order to provide full disclosure to the public.

**2.4.2.1.1.** The Environmental Impact Analysis Process serves as a basic source for determining the need for updating an AICUZ study. An EIAP analyzes proposed actions such as major operational or maintenance modifications, mission realignments, or mission beddowns. EIAP requires aircraft operational and maintenance data for any change be validated and fully analyzed (AFPD 32-70, AFI 32-7061, AFI 32-7063, AFI 13-201, and AFI 13-213). Alternatives to reducing noise exposure may be considered in the process. During the EIAP, analysis will determine if there is a significant impact on the AICUZ which would necessitate an AICUZ update.

**2.4.2.1.2.** Sometimes an AICUZ needs updating because a series of small modifications have been made in the flying mission. Often these changes individually are of little consequence and have been Categorically Excluded (CATEXed) from NEPA (AFI 32-7061). However, cumulatively, these changes may warrant updating the AICUZ study, particularly when the 2 dB threshold is exceeded.

**2.4.2.2.** An AICUZ study typically contains specific land use compatibility recommendations based on analysis of the relationships between aircraft operational effects and existing land use, existing zoning, and planned or anticipated land use. The study should include narratives discussing existing and future compatible and incompatible land uses. The AICUZ study and Implementation and Maintenance Plan (IMP) are prepared according to this AICUZ Handbook and approved by MAJCOM. Each AICUZ study should contain the elements listed in Table 2.2.

**Table 2.2. AICUZ Study Elements**

| | |
|---|---|
| Volume 1, The AICUZ Report | |
| Dated Transmittal Letter Signed by Group or Installation Commander and indicating the installations POC and phone number. | |
| Introduction to the AICUZ Program: | Purpose<br>Need<br>Procedure |
| Description of the Installation: | Installation Mission, Summary of the Flying Activity, Aircraft Types, and Economic Impact Study, If Desired |
| Brief Description of the Basis for Land Use Compatibility or Incompatibility: | In the Accident Potential Zones<br>In the Noise Zones<br>Height Restrictions<br>Additional Considerations |
| Recommendations and Guidelines for Determining Compatible Land Use (Tables and Appropriate Narrative | |
| Land Use Analysis: | Existing Land Use<br>Zoning and Other Ongoing Implementation Actions<br>Future Land Use<br>Incompatible Development |
| Maps with Appropriate Narrative: | Vicinity Map<br>Flight Tracks Map<br>Separate Accident Potential Zones Map (optional)<br>Separate Noise Contour Map (optional)<br>Existing Off-Base Land Use Map overlaid on copy of G5<br>Existing Off-Base Zoning Map overlaid on copy of G5, (if applicable)<br>Future Off-Base Land Use Map overlaid on copy of G5<br>Composite AICUZ Map (combined noise contour and accident potential zone map, G3 combined with G4) |
| Implementation and Maintenance Responsibilities of Air Force and Local Government | |
| Volume 2, The Appendices | |
| Appendix A | The AICUZ Concept, Program, Methodology, and Policies |
| Appendix B | Accident Potential Zones |
| Appendix C | Description of the Noise Environment |
| Appendix D | Height and Obstruction Criteria |
| Appendix E | Noise Level Reduction Guideline Sources |
| Volume 3, The Implementation and Maintenance Plan (for internal use only) | |
| Implementation and Maintenance Responsibilities Including Public Release Procedures | |
| Points of Contact | |

**2.4.2.2.1.** The maps included in the AICUZ report, Volume 1, should be intermingled with the narrative. The AICUZ report should include all three volumes, each as a separate volume. However, in some cases, it may be more cost effective to combine Volumes 1 and 2 into a single volume. If this occurs, Volume 2 should be called the Appendices of Volume 1 and Volume 3 should be designated Volume 2.

**2.4.2.3.** The installation may prepare a Citizens Brochure, summarizing the AICUZ process in nontechnical terms and containing the noise contours and summarized land use compatibility recommendations. These brochures are used in conjunction with the public release of the full AICUZ report. Sample formats for the AICUZ study, Appendices, Implementation and Maintenance Plan and Citizens Brochure are provided in Attachment 5 and are also available from MAJCOM or AFCEE/ECC.

**2.4.3. AICUZ Amendments.** The major command must approve each AICUZ amendment before public release. An AICUZ amendment format may be employed in place of a full AICUZ study, if the following conditions are met: If the current AICUZ study is less than four years old (release date). If changes are few and minor in nature. If little explanation is needed. If no known controversy exist.

**2.4.3.1.** AICUZ studies will no longer include Appendix F, Sample Population Density Guidelines. Installations may provide, as a separate document, the updated version of the SACOG population density guidance to local officials upon request.

**2.4.3.2.** The AICUZ amendment consists of the following elements: Transmittal letter dated and signed by the Group or Installation commander. Corrected pages for insertion into the latest AICUZ study.

**2.4.3.2.1.** The AICUZ amendment will be released as follows: First, public notification of mail out release is accomplished through newspapers and other media two weeks in advance of the mail out. Second, copies mailed simultaneously to all recipients of the latest public release of the AICUZ study. Finally, copies sent simultaneously to local libraries, agencies, local governments, organizations, and individuals known to have an interest.

**2.4.4. AICUZ Requirements at Joint Use Installations.** AICUZ requirements also apply to installations owned and operated by the Air Force where non-Air Force flying operations are conducted. All flying operations are included in the AICUZ study.

**2.4.4.1.** Where the Air Force conducts aircraft operations as part of a joint use arrangement in which the Air Force does not own or operate the runways, an AICUZ map showing noise contours based on both military and civilian operations is prepared. The map is submitted to the airfield operator with a request to jointly prepare and publish an AICUZ or similar study. If the airfield operator does not agree, all AICUZ materials are turned over to the airfield operator and all land use compatibility matters are referred to the operator. The Air Force assists as required.

**2.4.4.2.** If an Air Force unit is located on an airfield neither owned nor operated by the Air Force, the MAJCOM/CE must inform the airfield operators of the AICUZ program and encourage preparation of a joint AICUZ study or equivalent. If the airfield operator requests an AICUZ study, the Air Force assists as required.

**2.4.4.3.** At major commercial airports, the NEPA noise requirement is met by the Federal Aviation Administration (FAA) analyzing noise contours developed using their methodology, the Integrated Noise Model (INM). If desired, AFRES or ANGRC units at commercial airports can generate a NOISEMAP noise contour grid file based only on the Air Force aircraft activity. The NOISEMAP grid file can then be combined with the FAA (INM noise contour) grid file using either a Geographic Information System (GIS) or the plotting portion of NOISEMAP called NMPLOT. Where the commercial airport operator has previously released airport noise contours, care must be taken to ensure any noise contours released by the Air Force do not conflict with those published by the FAA.

**2.4.4.4.** During an EIAP action at a joint use airfield (not operated by the Air Force), a noise zone map is prepared for a proposed operational or maintenance change, mission realignment, or mission beddown and then given to the airfield operator once a FONSI or ROD has been signed. If a commercial airport operator has already published a noise map for the airfield, the noise methodology (INM or NOISEMAP) used in the original release may be used to update the published noise maps in the EIAP. If an AICUZ study has already been released, it must be amended to show the changes.

**2.4.4.5.** The only time the Air Force will use INM is when an Air Force installation is converting to civil aviation use only. INM can not be use to adequately address ground runup noise and existing noise scenarios involving military only or joint use operations. NOISEMAP can evaluate specific flying characteristics at specific bases, whereas INM is geared to routine flying operations at typical airports.

**2.4.4.5.1.** When an Air Force airfield is proposed for conversion to civil aviation use, but will retain military activity, use the NOISEMAP Model with minimum noise contour of 65 DNL. For California use Community Noise Equivalent Level (CNEL) noise contours as well as DNL noise contours, all beginning with 60 dB. When the installation is converting to civil use only use the Integrated Noise Model (INM).

**2.5. Phase IV -- Public Release of an AICUZ Study or Amendment.** Following the incorporation of reviewers' comments and major command approval, Phase IV begins and the AICUZ study or amendment is released to the general public and government officials.

**2.5.1.** Generally, the installation commander releases the AICUZ study or amendment in a public meeting. The installation CE, DO, PA, and JA assist the commander in all phases of the public release. For unique cases, MAJCOM/CE 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/CE. If a waiver is approved, copies of the amendment are sent simultaneously to all parties who would have been invited to the public meeting or who received a previous study or amendment. Furthermore, advance notice of the release is placed in the media and copies of the AICUZ study or amendment are made available to the general public (placed at local libraries, given upon request, etc.). Following the public release, a copy of the AICUZ study or amendment is sent to each state single point of contact identified in EO 12372. Copies of the AICUZ study or amendment are also sent to other pertinent state and local review agencies designated under the state process.

**2.5.2.** Phase IV places the AICUZ program into the public forum. During this phase, a coordinated team effort is imperative to ensure those who may be affected by the AICUZ are brought into the planning process and to provide

additional guidance and clarification, if needed. Chapter VI, Section B.2 and Appendix E-1 of the IICEP Handbook covering Coordination with Civilian Agencies (IEPB 14) should be reviewed at this time and used as guidance.

**2.5.2.1.** Typically the public release meeting is held off base to encourage maximum participation and avoid the perception of undue influence by the base. A good or bad location could set the tone for the entire meeting. All Air Force participants need to provide clear, concise, and consistent information so the base's goals and objectives are apparent to the public.

**2.5.3.** The appropriate Air Force Regional Compliance Office coordinates the release of the study or amendment with appropriate federal regional officials. The Regional Compliance Offices are divisions of the Air Force Center for Environmental Excellence and are located in Atlanta (AFCEE/CCR-A), Dallas (AFCEE/CCR-D), and San Francisco (AFCEE/CCR-S).

**2.5.3.1.** HQ USAF/ILEV coordinates distribution of the study or amendment to federal agency and congressional officials in Washington, DC. Prior to public release, congressional coordination is conducted through the Secretary of the Air Force, Office of Legislative Liaison.

**2.5.3.2.** In order to ensure proper coordination with appropriate state and federal agencies and congressional delegations, it is necessary to send the following to arrive at least 10 days prior to the public release meeting:

**2.5.3.2.1.** Twelve (12) copies of the AICUZ study or amendment, two (2) copies of the Citizens Brochure, and one (1) copy of the AICUZ Implementation and Maintenance Plan (IMP) to HQ USAF/ILEV. Notification to HQ USAF/ILEV should be made by telephone when the package is shipped.

**2.5.3.2.2.** Six (6) or the appropriate number of copies of the AICUZ study or amendment and one (1) copy of the IMP to the appropriate Regional Compliance Office (AFCEE/CCR-A, AFCEE/CCR-D, or AFCEE/CCR-S).

**2.5.3.2.3.** Two (2) copies of the AICUZ study or amendment, one (1) copy of the IMP, and two (2) copies of the Citizens Brochure to MAJCOM/CE.

**2.5.3.2.4.** One (1) copy of the AICUZ study or amendment, one (1) copy of the IMP, and one (1) copy of the Citizens Brochure to AFCEE/ECC.

**2.5.3.3.** The actual public release date must be coordinated with MAJCOM/CE, HQ USAF/ILEV, and the appropriate Regional Compliance Office (AFCEE/CCR-A, CCR-D or CCR-S). Federal agencies normally require at least a 21-day advance notice of the public release date for their review and scheduling purposes.

**2.5.3.4.** At least 21 days prior to public release, the Regional Compliance Office will distribute copies along with a cover letter announcing the date and location of the public release meeting to appropriate federal agency regional offices, each state single point of contact identified in EO 12372 and other state and local contacts in accordance with state and local Memoranda of Understanding.

**2.5.4.** Where possible or feasible, an updated AICUZ study or amendment should be prepared simultaneously with the Environmental Assessment and/or Draft Environmental Impact Statement. Updated AICUZ studies should be publicly released in accordance with AFI 32-7063 after a Finding of No Significant Impact (FONSI) has been made or a Record of Decision has been finalized.

**2.5.5.** Following release of the AICUZ study or amendment, the installation should forward periodic progress reports to MAJCOM/CE, who in turn consolidates and sends progress reports to HQ USAF/ILEV, AFCEE/ECC, and the appropriate Regional Compliance Office on the release status such as: recommendations implemented or possible litigation action. In all cases where adverse governmental or public reaction occurs, HQ USAF/ILEV, MAJCOM/CE, AFCEE/ECC, and the appropriate Regional Compliance Office should be notified and provided with details. Such information allows these offices to achieve necessary coordination with other agencies and respond to questions in a timely manner.

**2.5.6.** At the installation, a copy of the AICUZ study or amendment is maintained in the Housing Referral Office, Public Affairs, Legal Office, and Civil Engineering. An enlarged copy of the AICUZ map should be displayed in a conspicuous location at the Housing Referral Office. This ensures Air Force personnel seeking off-base housing will be aware of the noise or accident potential impacting adjacent land areas.

**2.6. Phase V -- AICUZ Implementation and Maintenance.** After the AICUZ study or amendment is prepared and released, the installation is ready to begin the most important aspect of the program -- Implementation and Maintenance. The basis for implementing AICUZ guidelines lies in the exercising of police powers by local governments to protect the public health, safety, and welfare. Through conveyance of these powers from the state, local governments adopt and enforce zoning regulations and other land use controls. These controls are the primary tools for protecting Air Force installations from encroachment by incompatible development. The following sections discuss specific methods, strategies, and actions for the Air Force to use in promoting implementation of AICUZ recommendations. Included is a discussion of the Joint Land Use Study (JLUS) program, a method for promoting local community implementation of the Air Force AICUZ program.

**2.6.1.** The success of the AICUZ program depends on its voluntary acceptance and use by local governments, private individuals, and other agency officials. These groups and individuals must know, understand, and be convinced of the need for the AICUZ program. This is accomplished through a series of steps taken by the installation as well as higher

headquarters. During this process, local governments, agencies, groups and individuals should continually be informed of the need for compatible development. The installation must stay abreast of activities within the AICUZ area and, when necessary, take a formal position on land use proposals. In Phase V, the primary emphasis is on developing an effective and sustaining relationship with local communities on land use planning. The installation fully participates in the local and regional planning and intergovernmental coordination and public information exchange. The Regional Compliance Offices (AFCEE/CCR-A, CCR-D, and CCR-S) work through state legislative coordination processes while HQ USAF/ILEV maintains interagency coordination with federal officials in Washington, DC.

**2.6.2. AICUZ Implementation Strategies.**

**2.6.2.1. Step 1: Informing the Public and Government Agencies.** AICUZ is primarily implemented through voluntary action of local government officials and the policies of federal agencies (e.g., Department of Housing and Urban Development, Veterans Administration, or Farmers Home Administration). These officials must know what the AICUZ recommendations are before they can consider acting on them. The process of providing information to the general public should continue after the formal release of the AICUZ study or amendment. The process of providing general AICUZ information to local planning agencies, however, can begin before the formal release. Local planning officials should be brought into the process at an early stage in order to improve the prospects for acceptance of the AICUZ recommendations.

**2.6.2.1.1.** Information can be exchanged on a government-to-government basis where local planning officials are given an opportunity to review the AICUZ information and identify potential problems and solutions. Bringing the local planning officials into the process early is a means to gain support for the AICUZ study process. However, draft AICUZ contour maps must not be released to local agencies or the general public without prior approval of the MAJCOM/CE. Agency personnel responsible for making land use decisions may change. When this occurs, new personnel should be briefed on the AICUZ program and process.

**2.6.2.1.2.** There are a number of agencies and organizations with a potential interest in receiving AICUZ information. The installation AICUZ Program Manager should determine which local governmental agencies and special interest groups to brief on the program. The installation AICUZ Program Manager should determine which agencies are considering actions which may potentially impact the installation. Table 2.3 (by no means complete) contains a number of agencies to consider contacting.

**Table 2.3. Potential Agencies Interested in AICUZ Information.**

| **Federal Government** | |
|---|---|
| Department of Agriculture | Department of Education |
| U S Forest Service | Department of Commerce |
| Soil Conservation Service | Census Bureau |
| Department of the Interior | Department of Labor |
| Bureau of Land Management | Veterans Administration |
| Fish and Wildlife Service | Farmers Home Administration |
| National Park Service | Office of Economic Planning/Development |
| Advisory Council on Historic Preservation | Environmental Protection Agency |
| Health & Human Services | Department of Energy |
| Department of Transportation | Navy/Marines |
| Federal Aviation Administration | Army (COE) |
| Federal Highway Administration | Coast Guard |
| Housing & Urban Development | |
| **State Government** | |
| Senators (local and key committees) | Agriculture |
| Representatives (local and key committees) | Emergency Response Agency |
| Planning Department | Transportation |
| Economic Department | EO 12372 Single Point of Contact |
| Employment Department | County Agency |
| Highway Department | Aeronautics Department |
| Recreation Department | State Historic Preservation Office |
| Natural Resources | Conservation Department |
| Fish and Wildlife | Coastal Agency |
| Land Department | Solid Waste Department |
| Water Resources | Environmental Agency |
| Air Quality | Health Agency |
| **Local Government** | |
| Municipal | Fire Districts |
| County | Emergency Response Agencies |
| Councils of Government | Water Districts |
| Planning and Zoning Boards | Soil Conservation Districts |
| EO 12372 Designated Agencies | Flood Control Districts |
| School Districts | Solid Waste Authority |
| Sewer Districts | Redevelopment Agencies |
| **Interest Groups** | |
| Air Force Association | Local Chapters of Professional Organizations (e.g., AIA, ASCE, APA) |
| American Legion | Bar Association |
| Veterans of Foreign War | Newspapers |
| Chamber of Commerce | Television Stations |
| Board of Realtors | Radio Stations |
| Real Estate Brokers Association | Industrial Councils |
| Homebuilders Association | Council of Churches |
| Homeowners Associations | Key Landowners & Developers |
| Base Community Councils | Unions |
| Environmental Groups | |
| Retiree Organizations | |

**2.6.2.1.3.** The installation AICUZ Program Manager should:

**2.6.2.1.3.1. Establish both a formal and informal network of contacts to routinely exchange planning information.** Installations may develop Memoranda of Understanding (MOUs) with appropriate local planning and community development agencies to establish a formal exchange of information on land use proposals. In addition to local agencies, it is especially important to coordinate with federal agencies that directly subsidize housing, such as the U. S. Department of Housing and Urban Development, Veterans Administration, and Farmers Home Administration. Under Federal

Management Circular 75-2, these federal agencies, through their various housing support programs, are required to help protect Air Force bases from encroachment. However, these agencies require Air Force assistance. The Regional Environmental Offices provide copies of newly released AICUZ studies and amendments to these agencies. Nonetheless, the installation AICUZ Program Manager must manage the day-to-day coordination on issues relating to the installation. The installation should maintain an up-to-date list of contacts, addresses, and telephone numbers of each relevant agency and organization.

**2.6.2.1.3.2. Installation personnel should prepare a formal presentation of the AICUZ program.** This presentation can be given individually or collectively to local planning commissions, city councils, county legislatures, county planning commissions, councils of government and other interested agencies. This presentation should inform the general public on AICUZ issues, installation economic impact, and the need for responsible land use planning. The presentation may be given to organizations (e.g., Chamber of Commerce, Board of Realtors, etc.) and at town meetings. Elected officials are ultimately responsible for compatible land use development. However, they typically receive land use recommendations from a planning commission (made up of appointed local citizens) who are advised by a planning department. The biggest impact on the elected officials, however, comes from the concerns of the general public as well as vested interests.

**2.6.2.1.3.3. Develop a skill for working with the public.** Working with the public is an acquired skill, developed by experience. There are documents available to help with this task. Techniques for dealing with the public are discussed in information documents, such as FAA's *Community Involvement Manual* (FAA-EE-90-03, August 1990, USDOT FAA, Office of Environment and Energy, Washington, DC 20591 NTIS #ADA 081465), and *Public Participation in Resource Planning* (U. S. Forest Service, Selected Literature Abstracts, April 1982). These manuals provide valuable information and describe techniques for working with the public (meetings, hotlines, brochures, exhibits, open houses, etc.). Procedures for conducting public meetings can also be found in Attachment 3 of AFI 32-7061.

**2.6.2.2. Step 2: Identifying Incompatible Land Uses.** 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. Lines of communication should be established with other applicable government agencies (councils of governments, airport authorities, other military installations, utility districts, etc.) as well area offices of as appropriate federal and state agencies (State Airport Board, State Real Estate Commission, Office of Economic Planning and Development, HUD, VA, FHA, FAA, etc.). These agencies may have an influence on proposed developments near air installations.

**2.6.2.2.1.** The Base Community Planner, accompanied by other installation experts, if possible, should attend and participate at appropriate zoning commission, city council, county board, and other meetings and hearings where they may potentially affect the installation. In order to obtain additional information on future development plans affecting the installation, efforts should also be made to attend and participate at meetings of local airport authorities, council of governments, utility districts, realtors' associations, homebuilders' associations, etc. Like any other landowner, the Air Force has the right to express concern in planning and zoning issues. The Air Force needs representatives at these meetings to look out for Air Force interests. The installation representative shall obtain prior clearance from Public Affairs before stating any official or unofficial position or making a presentation at a public meeting.

**2.6.2.2.2.** Local changes in land use cannot be monitored solely from the desk. Installation personnel should make regular field visits outside the installation to look for signs of development (surveyor stakes, For Sale signs, proposed zoning change notices, development signs, digging, etc.) that could affect AICUZ. Installation personnel may identify development proposals from several sources:

**2.6.2.2.2.1.** State or Local single point of contact

**2.6.2.2.2.2.** Local or Regional or State plans (e.g., county comprehensive plans, regional transportation plans, etc.)

**2.6.2.2.2.3.** Articles and notices in local newspapers

**2.6.2.2.2.4.** Agency newsletters

**2.6.2.2.2.5.** Advisory committee meetings of county and regional planning agencies

**2.6.2.2.2.6.** Informal discussions with local planners, transportation planners, utility companies, bankers, realtors, and developers

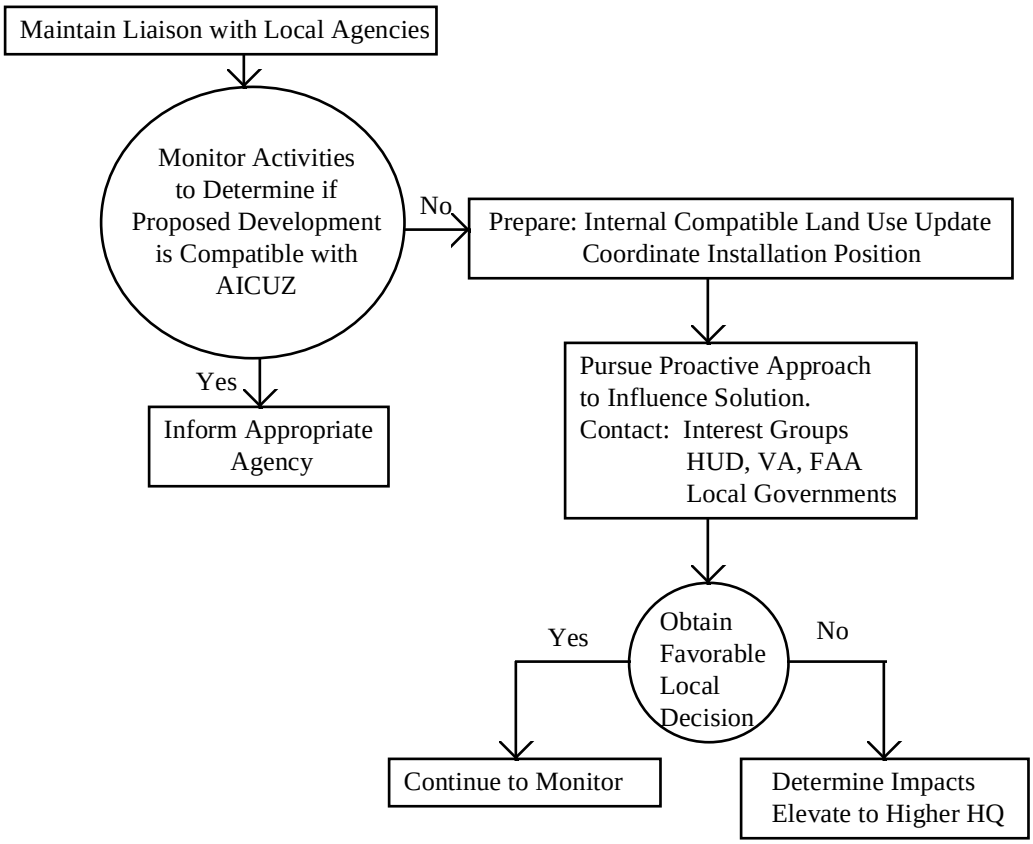
**2.6.2.2.2.7.** In addition, the Air Force Regional Compliance Offices obtain information from federal regional offices about plans, programs, and projects for which a federal agency has direct or indirect responsibility.

**2.6.2.2.2.8.** Planning or Zoning board agendas

**2.6.2.2.3.** Installations should take positive action to develop support in the community for the AICUZ study and for the Air Force mission. The installation should stipulate the AICUZ recommendations to the community are only recommendations. Installations should participate in the local planning process through pertinent organizations. Full information regarding AICUZ requirements should be made available to local governments, civic associations, libraries, school districts, and other concerned groups. Appropriate groups or individuals may be invited to the installation to familiarize them with installation operations and mission. Membership representation on speaker bureaus and membership in community organizations are additional opportunities to present the Air Force position in nonadversarial circumstances.

**2.6.2.2.4.** Potential incompatible land use proposals may take many forms:
**2.6.2.2.4.1.** Request to a planning board for rezoning or a variance to permit an incompatible use, a higher density, or removal of a height restriction.
**2.6.2.2.4.2.** Proposal for a major thoroughfare change or expressway development.
**2.6.2.2.4.3.** Proposal for a major extension of water, electric, or sewage lines.
**2.6.2.2.4.4.** Request for major flood control improvement or infrastructure construction.
**2.6.2.2.4.5.** Request to a planning board for approval of a subdivision.
**2.6.2.2.4.6.** Selection of a site for a community facility (e.g., school or hospital).
**2.6.2.2.4.7.** Request to the town engineer to approve a street map.
**2.6.2.2.4.8.** Request to a utility or sewer district for a new hookup.
**2.6.2.2.4.9.** Request to a state or regional agency for a coastal or wetlands permit.
**2.6.2.2.4.10.** Request to a state or federal agency for financial assistance.
**2.6.2.2.4.11.** Proposal to complete a comprehensive land use plan.
**2.6.2.2.5.** After identifying a potentially significant incompatible land use proposal, the installation should inform the appropriate agency of why the proposal is considered to be incompatible. A multidisciplinary team approach will be most effective in this endeavor. The installation should use its own expertise to help with encroachment issues. The Base Community Planner identifies an initial encroachment issue, integrates the views of the Installation Commander, the Staff Judge Advocate, the Public Affairs Officer, and Flight Operations Officer, and helps prepare the installation's position to be presented to the decision-making agency. Additional support could also be enlisted from the flying wings, base operations, etc. The Base Community Planner prepares an internal report describing the proposed changes in land use and community-installation interactions. This report will provide written record of the AICUZ program implementation while informing key installation personnel, major command, Regional Compliance Office, Air Staff and AFCEE/ECC of ongoing developments. Complete records of all AICUZ actions should be maintained. AFMAN 37-139, *Records Disposition--Standards*, describes AICUZ file retention requirements.
**2.6.2.3. Step 3: Opposing Incompatible Land Use Proposals.** Once a land use proposal has been identified as incompatible with the AICUZ guidelines, the installation must assess the impact and inform appropriate agencies of its concerns. Direct 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, an installation representative should attend the hearing to voice the concerns. If a MOU is implemented, it should be utilized to provide opportunities for comments. 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 and the installation should ensure its views are presented. The installation should provide information to the news media explaining the reason for opposition to the proposal.
**2.6.2.3.1.** Presentation of the installation's concerns should be a team effort involving the Installation Commander, the Base Community Planner, the Public Affairs Officer, the Staff Judge Advocate, and the Airspace Manager. The team should determine who should speak, what information should be released, and to whom it should be distributed. The installation should negotiate with the decision-making body to achieve a result protecting the vital interests of the installation. (A flow diagram summarizing the strategy for opposing incompatible land use is provided in Figure 2.1.)

**Figure 2.1. AICUZ Coordination -- Strategy for Opposing Incompatible Land Use.**




NOTE: Chart refers to installation action unless otherwise noted

**2.6.2.4. Step 4: Promoting Long Term Solutions.** The installation should seek long term solutions to achieve land use compatibility rather than dealing with problems on a case-by-case basis. In a case-by-case approach, some proposals may succeed for reasons other than the merits of the issue. A long term solution may be easier to enforce, once adopted. An important point to make to local officials throughout the AICUZ process is AICUZ inputs are just one of several planning determinants a community considers in developing a comprehensive plan or evaluating a plan amendment. The AICUZ land use guidelines describe land use compatibility based on aircraft operations only. Final land use plans and implementing ordinances should address other land use determinants such as physiographic features, vegetation, soil characteristics, existing land use, and economic and social demands. The general categories of long term solutions for compatible land use are listed below:

Plans and Programs
Acquisitions
Capital Improvements
Land Development Controls
Financing Restrictions
State Legislation
Land Swaps
Building Codes
Fair Disclosure

**2.6.2.4.1.** Table 2.4 list questions that should be used in developing the installation's long term strategies for implementing solutions for compatible land use within the AICUZ:

**Table 2.4. Questions on Long Term Strategies.**

| |
|---|
| Does the public receive AICUZ information? |
| Is the community reaction to and support of AICUZ positive?<br>Are home buyers and renters advised of aircraft noise and airport hazards? |
| Is there an AICUZ coordination process? |
| In general, is there a cooperative and effective effort underway?<br>Are Environmental Impact Statements relating to AICUZ properly coordinated?<br>Is the EO 12372 process working? (EO 12372 is the executive order covering interagency/intergovernmental coordination for environmental planning) |
| Is AICUZ included in USAF plans and programs? |
| Plans: Is AICUZ totally included in the Installation Comprehensive Plan?<br>Is AICUZ partly included in the Installation Comprehensive Plan<br>Is AICUZ included in other Air Force plans? |
| Environmental Management Program: Is AICUZ included in the Coastal Zone Management Program? |
| Has there been land acquisition by civilian agencies for AICUZ? |
| Has there been capital improvements used for AICUZ? |
| Are there local development controls? |
| Land Use Plans: Is AICUZ totally included in Land Use plans?<br>Is AICUZ partially included in Land Use plans? |
| Zoning: Is AICUZ totally implemented in zoning ordinances?<br>Is AICUZ partially implemented in zoning ordinances?<br>Are there any height and obstruction ordinances? |
| Are there subdivision regulations used for AICUZ? |
| Are there special use designations used for AICUZ? |
| Are there special permits used for AICUZ |
| Do building codes incorporate noise level reduction? |
| Is there an official map used for AICUZ? |
| Are there financing restrictions used for AICUZ? |
| Is there state legislation for airport/airfield planning? |
| Other Possible Questions |
| Have incompatible development proposals been denied?<br>Have developers voluntarily modified proposals for AICUZ?<br>Are any actions pending?<br>Is encroachment taking place on land zoned for AICUZ? |

**2.6.2.4.2.** The installation should prepare a document entitled, "Long Term Land Use Compatibility Trends." The document should be a strategy paper describing the land use situation, proposing a strategy for compatible development, and giving recommendations for implementation. This strategy paper should be presented to key installation personnel. The paper should be evaluated by the group, modified when necessary and adopted as official installation policy. This policy will help the installation avoid conflicting statement when different representatives discuss development issues with local communities.

**2.6.3. Clear Zone Issues.** The only real property interests to be acquired by the Air Force are those necessary to prevent incompatible land use in the Clear Zone (Certain joint-use installations are exempt from the Clear Zone Acquisition

Program). Clear Zones are safety areas, typically 3000 feet by 3000 feet, located immediately off the ends of active runways. The overall risk for aircraft accidents in the Clear Zone is so high, the Air Force generally acquires off-base land through purchase or easement to prevent development. MAJCOM/CE is responsible for acquiring real property interests within the Off-Base portions. A real property interest must be acquired over all property within the Clear Zone. MAJCOM/CE determines exceptions to the Clear Zone boundaries and the real property interest to be acquired on a case-by-case basis. All real property interests are acquired per AFI 32-9001 guidance.

**2.6.3.1. Land Use in the Clear Zone.** Existing Air Force facilities and land uses may continue in the Clear Zone; however, replacement facilities will be programmed as part of the normal planning and programming process and must be sited outside the Clear Zone. People-intensive facilities and facilities for other than flight operations should be relocated outside the Clear Zone where possible. Exceptions to this would be navigational aids and essential operational requirements that, because of their functions, need to be sited within the Clear Zone for optimal performance. MAJCOM/CE must approve alterations, minor additions, or improvements to facilities in the Clear Zone. The width of Clear Zones may be based on highest accident potential area for specific runway and acquisition constraints. A Clear Zone 3000 feet wide should be observed for new construction of proposed Air Force facilities regardless of the established Clear Zone dimensions. The installation must fully justify and the MAJCOM/CE must approve any deviation to this restriction.

**2.6.3.1.1.** The Air Force (or others under Air Force permit) must not plan, locate, or construct a new use or facility within the boundaries of the Clear Zone. Acceptable uses within the Clear Zone are: agriculture; livestock grazing (excluding feed and dairy lots); permanent open space; existing or new water areas provided they do not create bird strike hazards; rights-of-way for single track railroads and fenced, two-lane highways without sidewalks or bicycle trails provided they do not violate obstacle clearance criteria; rights-of-way for communications and utilities provided all facilities are at grade level or underground; and essential navigation aids and operational facilities, provided there are no feasible alternatives. (This requires MAJCOM/CE approval.)

**2.6.3.1.2. The following uses are specifically prohibited within the Clear Zone (AFJM 32-8008 and AFI 32-70):**

**2.6.3.1.2.1.** A use releasing any substance into the air, such as steam, dust, and smoke, which impairs visibility or otherwise interferes with aircraft operations.

**2.6.3.1.2.2.** A use producing electrical emissions that interferes with aircraft operations, communications or navigational aid systems, or aircraft navigation equipment.

**2.6.3.1.2.3.** A use that produces light emissions either direct or indirect (reflective) which might interfere with pilot vision.

**2.6.3.1.2.4.** A use unnecessarily attracting birds or waterfowl, such as operation of sanitary landfills, operation of maintenance and feeding stations, or growth of certain crop or vegetation.

**2.6.3.1.2.5.** Explosives as described in AFMAN 91-201.

**2.6.3.1.3.** Buildings on newly acquired fee land within the Clear Zone must be demolished or relocated outside the Clear Zone and rubble must be removed. Easement acquisitions must conform to the estate acquired. Through programming avenues, the major command is responsible for any relocation of above-ground utilities, fencing, and any grading or seeding. In addition, MAJCOM determines what should be done with roads and sidewalks terminating in the acquired areas.

**2.6.3.1.4.** The building footprint for a shopping malls or centers will be considered as a single entity in all land use compatibility analysis. Shopping malls and centers will not be subdivided into individual land use types for the purpose of determining incompatible uses. Due to the concentrations of people associated with shopping malls and centers, these land uses are considered as incompatible within all Clear Zones.

**2.6.4. Land Use in the Accident Potential Zones.** Accident potential zone I is less critical than the clear zone, but still possesses a significant risk factor. This 3,000 foot by 5,000 foot area has land use compatibility guidelines which 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 concentrate people in small areas are not acceptable.

**2.6.4.1.** Accident potential zone II is less critical than accident potential zone I, but still possesses potential for accidents. Accident potential zone II, also 3,000 feet wide, is 7,000 feet long extending to 15,000 feet from the runway threshold. Acceptable uses include those of accident potential zone I, as well as low density single family residential, and those personal and business services and commercial/retail trade uses of low intensity or 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 appropriate.

**2.6.4.2.** High people densities should be limited to the maximum extent possible. The optimum density recommended for residential usage (where it does not conflict with noise criteria) in accident potential zone II is one dwelling per acre. For most non-residential usage, buildings should be limited to one story and the lot coverage should not exceed 20 percent.

**2.6.4.3.** The building footprint for a shopping malls or centers will be considered as a single entity in all land use compatibility analysis. Shopping malls and centers will not be subdivided into individual land use types for the purpose of

determining incompatible uses. Due to the concentrations of people associated with shopping malls and centers, these land uses are considered as incompatible within all Accident Potential Zones (APZ's).

**2.6.5. Joint Land Use Study (JLUS) Program.** The AICUZ program was established to provide information to local communities about noise and accident potential from aircraft operations, and to encourage communities to adopt land use controls that will ensure compatible development within the AICUZ area of influence. While some communities have accepted these recommendations, others have not. In order to enhance the acceptance of the AICUZ recommendations the Air Force initiated the Joint Land Use Study (JLUS) program in 1985.

**2.6.5.1.** JLUS is a cooperative effort between the installation and nearby communities. The objective of the program is twofold: First to encourage cooperative land use planning between the military installation and the surrounding communities so that future community growth and development are compatible with the training or operational missions of the installation. Second to seek ways to reduce the operational impacts on adjacent land.

**2.6.5.1.1.** The JLUS program encourages communities and the installation to study the issues in an open forum, taking into consideration both community and military viewpoints. Recommendations in these studies are used to guide local jurisdictions in developing and implementing of land use controls. The intent of the controls is to ensure that future public and private development around the installation will be compatible with both the military mission and the development needs of the community. Participation in the JLUS program is voluntary. The Department of Defense, Office of Economic Adjustment (OSD/OEA) coordinates and provides matching grants for preparation of this type of study.

**2.6.5.1.2.** The real success of JLUS is that the communities have been stepping forward to take positive action to control incompatible development which could adversely impact the flying mission. The following are several examples:

**2.6.5.1.2.1.** Sacramento County modified its zoning ordinance to improve protection for local Air Force bases.

**2.6.5.1.2.2.** A zoning ordinance has been enacted by Hoke County, NC near Pope AFB.

**2.6.5.1.2.3.** Land use plans, zoning amendments and building code changes were implemented for the communities surrounding Shaw AFB, SC.

**2.6.5.1.2.4.** Land use plan and zoning changes were implemented for jurisdictions surrounding Robins AFB, GA. Also, the State of Georgia appropriated funds to purchase land in APZ I.

**2.6.5.1.2.5.** The State of South Dakota has agreed to move the interstate highway interchange serving Ellsworth AFB that has caused the development of incompatible commercial uses in APZ I.

**2.6.5.2. Air Force Procedure.** The Air Force and OSD/OEA have agreed on the following procedures to be used to provide grants, cooperative agreements, and assistance in developing joint land use studies:

**2.6.5.2.1.** An annual call letter is sent to the MAJCOMs from AFCEE/EC each June to solicit applicants for the JLUS program. The MAJCOMs, AFCEE/EC and HQ USAF/ILEV narrow the field of applicants from which HQ USAF nominates bases through the Deputy Assistant Secretary of the Air Force, Environment, Safety and Occupational Health (SAF/MIQ) to OSD/OEA. The Air Force will nominate installations based on analysis of:

**2.6.5.2.1.1.** The extent and pattern of incompatible development around the base

**2.6.5.2.1.2.** The potential for future encroachment.

**2.6.5.2.1.3.** The relationship between installation and community. Prior history of cooperation on land use issues.

**2.6.5.2.1.4.** Identification of existing state airport or other legislation that would facilitate planning around the installation.

**2.6.5.2.1.5.** Written assurance of base support in updating AICUZ studies and participation in the JLUS activities.

**2.6.5.2.1.6.** Other factors, such as a proposed mission change, that would require the support of JLUS.

**2.6.5.2.1.7.** Description of the implementation status of the last AICUZ release and any plans for future releases.

**2.6.5.2.2.** A prioritized list of candidate installations will be provided by SAF/MIQ to OEA by the end of August. OEA grant approval for a community JLUS program should occur before May the following year, otherwise the Air Force will be asked by OEA to renominate the installation the following year.

**2.6.5.2.3.** SAF/MIQ consults with OEA to determine the number of installations to be nominated for a given year.

**2.6.5.2.4.** HQ USAF/ILE, will coordinate appropriate command support and require full base participation. The installation is the primary DoD representative in the joint DoD-community planning and zoning effort.

**2.6.5.3. OSD/OEA Procedures.** OEA procedures relating to the JLUS are as follows:

**2.6.5.3.1.** A cost share basis is 50% local, 50% OEA.

**2.6.5.3.2.** Coordination with SAF/MIQ on the selection of candidate installations. Coordination with HQ USAF pertaining to policy and guidance.

**2.6.5.3.3.** OEA will work with the communities to structure a joint DoD-community planning effort.

**2.6.5.3.4.** Provide assistance to the community and Air Force during the JLUS process. This assistance will include community visits and review of study products.

**2.6.5.3.5.** Emphasize to local communities that the objective of the study is implementation through development control mechanisms that protect the public's health, safety and welfare, and the Air Force installation's mission. An implementation strategy is to be included in all studies.

**2.6.5.3.6.** Work with the President's Economic Adjustment Committee (EAC) in implementing the recommendations of the approved JLUS.

**2.6.5.3.7.** It is mutually agreed that policy correspondence from any element of OSD, USD(A&T)ES going to the communities involved will be coordinated with the Wing Commander of the installation and MAJCOM/CE.

**2.6.5.4. Installation Participation.** For a successful JLUS, the installation's Wing Commander and personnel must be committed partners in the study. There are general requirements expected of the installation once they are approved for a JLUS. The installation supporting staff needs to fully participate in all steps which culminate with implementation of the study. The tangible gains of the Joint Land Use Study program far outweigh the commitments that the installation must make to the program. Further information on the program can be provided by AFCEE/ECC.

2.6.5.4.1. Air Force policy does not permit land acquisition under the AICUZ program in order to prevent incompatible land development, except in clear zones. JLUS proposals for Air Force land acquisition outside clear zones, must tactfully be discouraged by installation personnel attending JLUS committee meetings. Installation personnel must participate in the JLUS process and must emphasize achieving land use compatibility goals through AICUZ recommendations relating to land use planning, zoning and other forms of land use controls.

2.6.5.4.2. If the JLUS committee proceeds with recommendations of Air Force land acquisition which are not permitted, installations must endorse completed JLUS reports with the condition that the Air Force has a policy precluding land acquisition outside clear zones, for the purpose of controlling land use. Furthermore, installations need to indicate to JLUS committees that clear zone purchases, if still needed, are subject to standard Air Force project programming requirements and current federal budgetary constraints.

## Chapter 3

## ROLES AND RESPONSIBILITIES

**3.1. Introduction.** AFI 32-7063 establishes roles and responsibilities for the AICUZ program. The instruction identifies the MAJCOM's as having the primary responsibilities for the program, however, they are given the latitude to delegate responsibilities to the installations for their AICUZ program. This should be accomplished by issuing a supplement to AFI 32-7063. The greatest focus of activity for the AICUZ program is at the installation.

**3.1.1.** A team approach needs to be adopted to develop and maintain a good AICUZ program. Individuals from key organizations need to participate in the continuing effort of the program and participate in local community meetings on issues that affect their AICUZ program. The importance of working with local planning officials cannot be over emphasized. This relationship is critical in order to achieve and maintain the desired goal of compatible land use controls around the installation. Local officials and others in the community should be briefed on the status of the program and the need for its continued maintenance. Credibility and acceptance of the program by the local community is paramount to the program's success. This credibility can be achieved by an open information exchange and involving the public officials in the AICUZ process. The base AICUZ program manager, along with the base leaders, must make a commitment to promote AICUZ if this program is to be successful. The following sections identifies the roles and responsibilities of personnel involved in the AICUZ program.

**3.2.** The Assistant Secretary of the Air Force for Manpower, Reserve Affairs, Installations and Environment (SAF/MI). Provides the policy oversight for the AICUZ program.

**3.3. Headquarters United States Air Force (HQ USAF).**

**3.3.1.** The Civil Engineer (HQ USAF/ILE). Oversees the AICUZ program execution. Develops and interprets policy. Monitors policies, plans, programs and projects of other federal agencies at HQ level that may affect the AICUZ policies and procedures. Advocates for resources required to support the AICUZ program. Coordinates with and distributes the study or amendment to Federal agency officials and Congressional Officials in Washington DC. Resolves policy conflicts and controversy.

**3.3.2.** The Judge Advocate General (HQ USAF/JA) provides legal advice on all aspects of the AICUZ program.

**3.4. AFCEE.**

**3.4.1.** Air Force Center for Environmental Excellence Regional Environmental Offices (AFCEE/CCR)

**3.4.1.1.** Monitors the activities, plans, programs and projects of State legislatures and Federal regional agencies that may affect land use within the AICUZ.

**3.4.1.2.** Takes formal positions as required.

**3.4.1.3.** Assists MAJCOMs and installation, upon request, in implementing the AICUZ program.

**3.4.1.4.** Coordinates the study or amendment with appropriate Federal regional officials.

**3.4.1.5.** Keeps the installations, MAJCOMs, AFCEE/EC and HQ USAF informed of all significant AICUZ program events.

**3.4.1.6.** Works with State legislatures and regional officials in developing legislation relevant to noise and land use controls.

**3.4.1.7.** Supports the Joint Land Use Program.

**3.4.2.** Air Force Center for Environmental Excellence Environmental Conservation and Planning (AFCEE/EC) will: Maintain the central archive for all AICUZ and EIAP noise studies, and other related noise information programming. Provide technical assistance, quality assurance, data manipulation, and retrieval functions as requested. Notify MAJCOM/CEs when outside agencies have requested information and/or assistance involving their installations. Provide AICUZ training and inform MAJCOM/CEs of changes in the AICUZ program to include computer models.

**3.5. Major Commands (MAJCOMs).** As mentioned above, AFI 32-7063 establishes the MAJCOM's as having the broad responsibilities for implementing the AICUZ program. This requires full and continuous representation from the installation civil engineer, operations, air traffic control, public affairs, legal, safety, maintenance, comptroller, bioenvironmental engineering, weather, and other base personnel. MAJCOM's may delegate responsibilities to installations with the exception of MAJCOM approval, wavier, and exemption authorities. The following list of roles and responsibilities, while identified as MAJCOM responsibilities, may be delegated to the individual installations for implementing and maintaining the AICUZ program. The installation is where the responsibility for the AICUZ program belongs. It is where the data is gathered and where community involvement is established. The base Environmental

Protection Committee coordinates base aircraft operational and maintenance data and creates the team to support the AICUZ program.

**3.5.1.** MAJCOM/CE

**3.5.1.1.** Establishes and maintains an AICUZ program at each installation with an active runway.

**3.5.1.2.** Gathers, updates, and analyzes installation AICUZ data as well as any waivers/exemptions, and certifies their accuracy.

**3.5.1.3.** Prepares noise contour maps for approval.

**3.5.1.4.** Conducts technical reviews.

**3.5.1.5.** Prepares and updates the installations AICUZ study or amendment, the Implementation and Maintenance Plan, and the Citizens Brochure. Approves each document after technical review.

**3.5.1.6.** Releases the installation AICUZ studies in a public meeting with local and areawide officials.

**3.5.1.7.** Ensures coordination of the study with local, state and federal agencies.

**3.5.1.8.** Ensures the Air Force takes part in local and areawide planning and participates in the coordination process. Promote and encourage local community acceptance and adoption of AICUZ land use recommendations.

**3.5.1.9.** Initiates AICUZ updating actions.

**3.5.1.10.** By 1 July, each even number year sends an AICUZ status update (Biennial AICUZ Status Survey, RCS: HAF-CEV (BE) 9426) and review schedule for the next 24 months for each installation having an AICUZ requirement to AFCEE/ECC.

**3.5.1.11.** Consolidates and sends AFCEE/EC updated operational and maintenance data.

**3.5.1.12.** Updates the AICUZ file and historical documentation.

**3.5.1.13.** Updates the following land use descriptions or analyses: Existing land use, Future land use, Existing zoning, Planned developments, and incompatible land use.

**3.5.1.14.** Monitors development plans, programs, and projects that may affect land use within the AICUZ

**3.5.1.15.** Informs local and regional officials and the public of AICUZ considerations and take formal positions as required.

**3.5.1.16.** Participates in local government land use planning and control meetings.

**3.5.1.17.** Notifies the higher headquarters AICUZ staff of any off-base proposal or action that would result in incompatible land use or if a AICUZ study or amendment is, or may become, the subject of a court suit.

**3.5.1.18.** Ensures all AICUZ presentations and appearances by Air Force personnel are conducted according to HQ USAF policy and guidance.

**3.5.2.** MAJCOM Operations

**3.5.2.1.** Reviews and updates AICUZ aircraft operational data.

**3.5.2.2.** Coordinates all AICUZ matters affecting airspace use with the Air Force representative to the Federal Aviation Administration Regional Office.

**3.5.2.3.** Reviews and updates the maintenance data relative to flight line engine run-ups.

**3.5.2.4.** Evaluates and coordinates all proposed operational and flight line maintenance changes, thru EIAP.

**3.5.3.** MAJCOM Logistics evaluates and coordinates all proposed test cell and test stand maintenance changes, thru EIAP. This office also updates maintenance data from engine test cells.

**3.5.4.** MAJCOM Safety Office identifies all safety considerations to the operations group for analysis of operational changes.

**3.5.5.** MAJCOM Bioenvironmental Engineer assists in evaluating specific noise events.

**3.5.6.** MAJCOM Weather Office provides meteorological data.

**3.5.7.** MAJCOM Judge Advocate will update the state land use related legislation, local ordinances, legal (court) decisions, and legal descriptions (land).

**3.5.8.** MAJCOM Public Affairs Office serves as a focal point for working with local media and handling media and public inquiries. This office will also assists the installation commander.

**3.5.9.** MAJCOM Air Traffic Control Office will update any navigational aid changes, standard approaches or departures, and standard local patterns.

## Chapter 4

## DATA COLLECTION

**4.1. Introduction.** Data collection is the most crucial step in the AICUZ process. The accuracy of aircraft operational and performance data obtained for a NOISEMAP computer run is critical to the prediction of accurate noise contours. Information is gathered from pilots, unit commanders, and operations and maintenance personnel on the number and type of aircraft operations conducted at the installation. Interviews with key personnel are usually the best means of obtaining the required data. This information is entered onto AICUZ data sheets following the guidelines given in this chapter. The data is then entered into the BASEOPS input program for processing in the computer noise model, NOISEMAP. NOISEMAP is the Air Force approved noise modeling program which will be used for all studies to produce the noise contours. The most current version of NOISEMAP is available from AFCEE/ECC.

**4.1.1.** This chapter defines the typical process used to collect and enter the data onto the Noise Survey data sheets. The data requirements for NOISEMAP are extensive and it is the responsibility of the data collector to understand the data requirements, sources of data, and where errors can occur. Assistance on AICUZ policy matters and procedures is available through MAJCOM/CE and HQ USAF/ILEVP. Assistance concerning technical matters involving the data collection phase, BASEOPS, and NOISEMAP is available from MAJCOM/CE and AFCEE/ECC.

**4.2. Preparing For A Data Collection.** A wide range of data must be collected to ensure noise contours are accurate. These various types of data correspond directly to the AICUZ data sheets on which they are recorded. The data covers assigned, transient and civil aircraft activities. The level of data required pertains directly to it's impact on the noise environment. The data collected include the following:

Airfield information
Aircraft summary
Daily operations
Individual flight track sketches
Individual flight profiles
Flight track inventories
Ground run-ups

**4.2.1. Initial Data to Be Collected.** The AICUZ data collection process, involves several steps:

**4.2.1.1.** Determine all activities associated with the operation of aircraft at the installation. This includes Air Traffic Control, Radar Approach Control, Base Weather Office, Aero Club, Transient Alert, Military Airlift Schedulers, Flying Squadrons, and Engine Maintenance Personnel.

**4.2.1.2.** Develop an interview schedule for each activity allowing plenty of time for the interview process. (For example, the interview with pilots of one type of primary aircraft requires a minimum of three hours. The interview with maintenance personnel on maintenance procedures for one aircraft type requires about one hour.)

**4.2.1.3.** A data package with a cover letter should be sent to each organization to be interviewed, at least two (2) months in advance of the scheduled interview. This gives the interviewees time to prepare. A follow-up call should be made to each organization to ensure the data package was received and see if there are any questions. Immediately before the data collection is to take place, a meeting should be held with representatives (preferably the interviewees) from all organizations to discuss the process and answer any questions.

**4.2.1.4.** A conference room should be dedicated to the data collection team while at the installation for conducting interviews and work sessions. The room requires a table that will seat 6 to 8 people and be large enough to lay out flight track maps and sketches.

**4.2.1.5.** Obtain a vicinity map including the base and surrounding area. The map should be of sufficient scale for pilots to recognize visual reference points. Transparent material (tracing paper, mylar, etc.) should be available to draw actual ground tracks while noting the power settings, airspeeds and altitudes flown on the tracks.

**4.2.1.6.** Obtain a base map (C-1 Map or Aircraft Parking Plan) showing parking spots of aircraft and any other locations where maintenance runs are performed (hush house, etc.).

**4.2.2. General Airfield Data.** The first data sheet of an AICUZ data package is the General Airfield Data, AF Form 3997, (See sample data in Figure 4.1.) records the information listed in Table 4.1.

**Table 4.1. Required General Airfield Data.**

| Required General Airfield Data | |
|---|---|
| Installation name and location | Standard TEMPERATURE and HUMIDITY at the airfield |
| Date the data collection was accomplished | Runway identifiers (IDENT) |
| Glide slope (GS) | Magnetic declination (MAG DEC) of the airfield |
| Runway length | Latitude and longitude of the midpoints of the runway thresholds |
| Elevation (ELEV) of the installation | Navigational aids (NAVAIDS) identifiers |
| Type of NAVAIDS | Latitude and longitude of the NAVAIDS. |

**4.2.2.1.** Some of the above data can be obtained from the DoD Flight Information Publication (FLIP),"High/Low Altitude Instrument Approach Procedures." The latest version of this publication can be obtained from Base Operations. The FLIP contains information on the installation's airfield to include runway identifiers, runway widths and lengths, the elevation of the base (identified inside a small box), and the magnetic declination. The glide slope (GS) will be given in the ILS Approach Figure found in the FLIP. All of this information can usually be obtained from Base Operations.

**4.2.2.2.** Navigational aid data are contained in the FLIP, "IFR Supplement," also obtainable from Base Operations. The Air Installation Data Sheet requests the following information regarding the navigational aid (NAVAID): the identifier, the type, and latitude/longitude coordinates. Types of NAVAIDs include TACAN, VOR, VORTAC, NDB, and VORDME. These NAVAIDs can be used for visual feedback in the BASEOPS program. When a NAVAID is entered into BASEOPS, the NAVAID will be displayed whenever a flight track is viewed to aid in the proper placement of the flight tracks.

**Figure 4.1. Sample AF Form 3997, General Airfield Data.**

| GENERAL AIRFIELD DATA | INSTALLATION | | | DATE *(YYYY MM DD)* |
|---|---|---|---|---|
| | Yourbase AFB TX | | | 1998 05 20 |
| POINT OF REFERENCE | LATITUDE | | LONGITUDE | ALTITUDE |
| Runway 05 | 38^15'18.3" North | | 35^59'29.5" East | 238 MSL |
| MAGNETIC DECLINATION | TEMPERATURE | X FAHRENHEIT | RELATIVE HUMIDITY | |
| 3.5^ West | 63 | CENTIGRADE | 69.00% | |

**RUNWAYS**

| RUNWAY NUMBER | GLIDE SLOPE | MAGNETIC HEADING | LENGTH | WIDTH | LATITUDE | LONGITUDE |
|---|---|---|---|---|---|---|
| 05 | 2.500 | 51.000 | 10001 | 200 | 38^15'18.3" North | 35^59'29.5" East |
| 23 | 2.500 | 231.000 | 10001 | 200 | 38^20'14.4" North | 35^62'48.2" East |
| | | | | | | |
| | | | | | | |
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**VTOL PADS**

| IDENTIFIER | VTOL PAD DESCREIPTION | LATITUDE | LONGITUDE | DISTANCE (IN FEET) FROM REFERENCE POINT | |
|---|---|---|---|---|---|
| | | | | X DISTANCE | Y DISTANCE |
| 05H | Helipad at TW A & RW 05 | 38^15'18.3" North | 35^59'23.5" East | 0 | -52 |
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**NAVAIDS**

| IDENTIFIER | NAVAID DESCREIPTION | LATITUDE | LONGITUDE | DISTANCE (IN FEET) FROM REFERENCE POINT | |
|---|---|---|---|---|---|
| | | | | X DISTANCE | Y DISTANCE |
| DAN | TACAN | 38^20'18.3" North | 35^60'29.5" East | 65 | -82 |
| NANC | Reporting Point NANCY | 38^40'22" North | 35^57'31.1" East | 6000 | -8500 |
| DIAN | Reporting Point Diane | 38^05'46.2" North | 35^45'24.7" East | -1500 | 6650 |
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**AF FORM 3997, AUG 98 *(EF-V1)***

**4.2.2.3.** The "standard day" temperature and relative humidity for the installation must be noted on an AF Form 3997, General Airfield Data. Since weather is an important factor in the propagation of noise, identifying the temperature and humidity conditions is critical to the accuracy of the final noise contours. NOISEMAP requires a medium air absorption value to represent sound absorption on a "standard day". This is determined using the Air Absorption Values chart in Table 4.2. The procedure for determining the "standard day" temperature and relative humidity values for a specific location for the purpose of "standard day" absorption values is as follows:

**4.2.2.3.1.** From the Base Weather Station, obtain a Air Weather Service Climatic Brief or Climatological Data Summary for the installation. This report gives climatic data for each month of the year, usually averaged over a 30 year time period.

**4.2.2.3.2.** Determine the average monthly temperature and relative humidity for each month of the year.

**4.2.2.3.3.** For each month of the year, use the average temperature and humidity to determine the air absorption coefficient on the following Atmospheric Absorption Coefficient Table, Table 4.2.

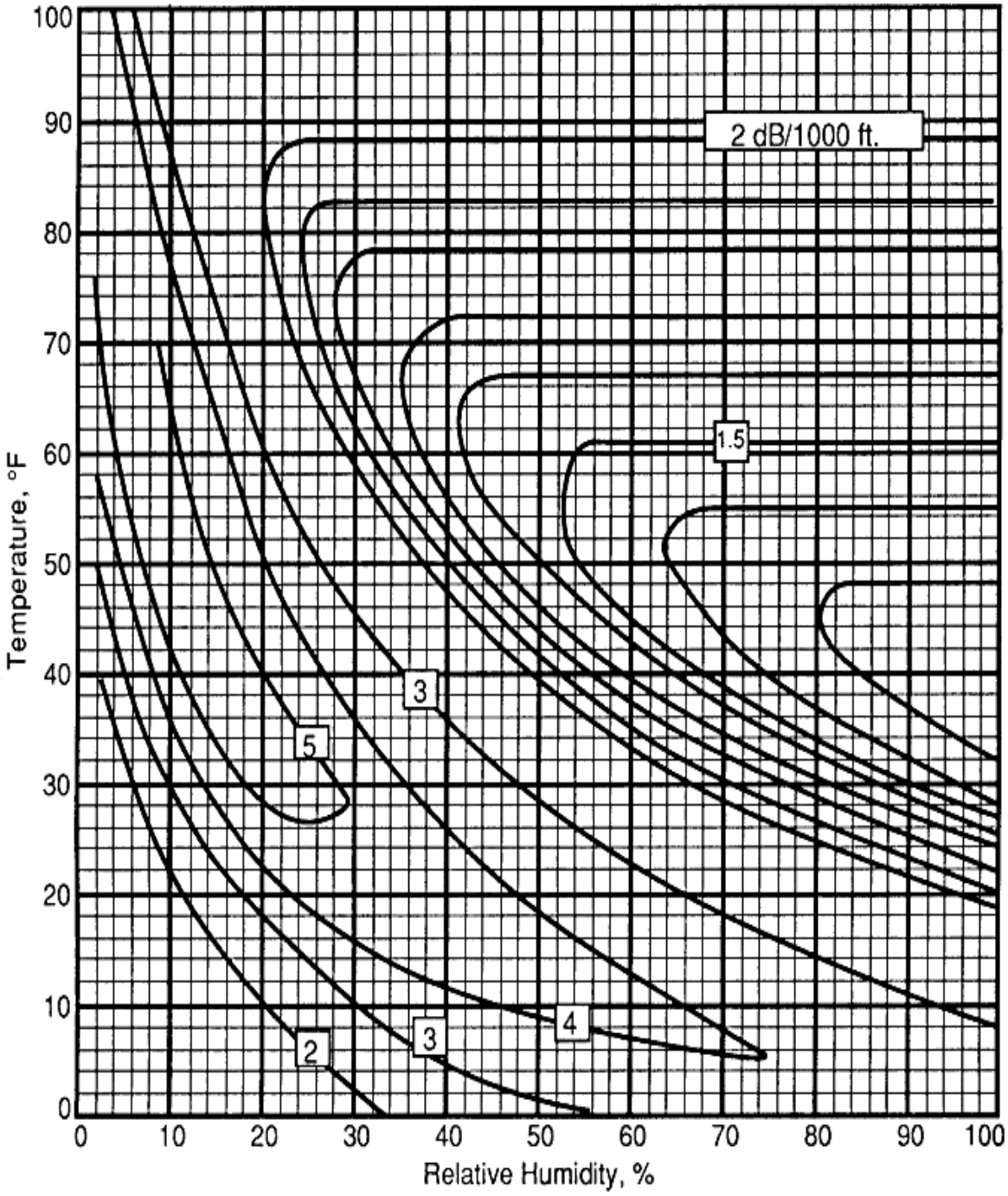
**4.2.2.3.4.** Once the absorption coefficient has been determined for all twelve months, rank the absorption coefficients in ascending order from smallest to largest absolute values.

**4.2.2.3.5.** Select the sixth smallest value of absorption coefficient and use the average monthly temperature and relative humidity corresponding to this absorption coefficient.

**4.2.2.3.6.** Where not given directly, monthly average values should be the arithmetic average (mean) of the "mean daily maximum" and "mean daily minimum" temperatures, and the arithmetic average of the highest and lowest relative humidity values listed for the month.

**4.2.2.4.** Only a rough estimate of latitude and longitude of the runway threshold at the centerline can be obtained from linear interpolation of the latitude and longitude lines on a map. Sometimes when such data are used in BASEOPS (and ultimately in NOISEMAP), crosswind runways will not be perpendicular to main runways or parallel runways may not be exactly parallel. Accuracy of runway threshold at the centerline in degrees, minutes, seconds, and to hundredths of a second are required to pin down the runway locations and assure proper orientation. Few maps will allow interpolation of latitude and longitude of runway threshold at the centerline to that accuracy. Base Operations or the Base Civil Engineer's office may have the most accurate data on the latitude and longitude of the runway threshold at the centerline.

**Table 4.2. Atmospheric Absorption Table. Atmospheric Absorption as a Function of Temperature and Relative Humidity in dB per 1000 feet -- at 1000 Hz Frequency.**




**4.2.3. Noise Sensitive Location Data .** The second page of the Data Collection Package is the AF Form 3998, Specific Noise Sensitive Location (Figure 4.2.) This form records the location and Day-Night Average Sound Level (DNL) at various locations I the vicinity of the installation which have been identified as noise sensitive areas. An area may be considered a noise sensitive area if aircraft noise may interfere with the normal activities associated with the use of the land. Noise sensitive areas include residential neighborhoods, educational, health and religious structures and sites and outdoor recreational, cultural and historic sites. The threshold for updating the AICUZ report is a change in DNL of 2 dB or more at a noise sensitive area. The noise modeling computer program, NOISEMAP, will compute the DNL at the selected critical locations. Determining if the 2 dB threshold has been exceeded can be done by comparing the current (or projected) DNL level to the previous DNL level at the spot.

**Figure 4.2. Sample AF Form 3998, Specific Noise Sensitive Location.**

| SPECIFIC NOISE SENSITIVE LOCATIONS | | INSTALLATION Yourbase AFB TX | | DATE (YYYY MM DD) 1996 07 27 | |
|---|---|---|---|---|---|
| IDENTIFIER | LOCATION DESCRIPTION | X DISTANCE [1] OR LATITUDE | Y DISTANCE [1] OR LONGITUDE | DNL BASELINE | DNL PROPOSED |
| LCRK | Little Creek Wildlife Refuge | 12916 | -10995 | 65.97 | 55.85 |
| MHN | Mobile Homes North of Airfield | 16393 | 8047 | 62.39 | 63.53 |
| HOSP | Psychiatric Hospital | 12916 | 6094 | 73.91 | 68.82 |
| GOLF | Golf Course Club House | -8279 | 2318 | 70.93 | 67.32 |
| HSCH | Private High School | -12585 | 3974 | 64.04 | 58.89 |
| RES1 | Residential Area | -21758 | 2318 | 68.19 | 63.65 |
| RES2 | Residential Area | -23182 | -6789 | 67.59 | 52.94 |
| RES3 | Residential Area | -30965 | 4305 | 57.45 | 56.79 |
| RES4 | Residential Area | -36263 | 4305 | 57.45 | 56.79 |
| MHS | Mobile Homes South of Airfield | -44377 | -5299 | 58.31 | 63.65 |
| SOC1 | Proposed Soccer Field Option 1 | 15896 | 3808 | 72.68 | 68.29 |
| SOC2 | Proposed Soccer Field Option 2 | 13909 | 3643 | 76.59 | 68.16 |
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1. DISTANCE MEASURED FROM THE AIRFIELD REFERENCE POINT.

**AF FORM 3998, AUG 98 *(EF-V1)***

**4.2.4. Aircraft Data Summary.** The Based Aircraft Operations, AF Form 3999 (See sample data in Figure 4.3.) should be completed listing all of the aircraft that fly at the installation. This should include assigned aircraft as well as aircraft which are deployed to the installation on a regular basis

**4.2.4.1.** The information to be included on the Bases Aircraft Operations form includes the following: aircraft type, daytime and nighttime departures, daytime and nighttime arrivals, daytime and nighttime closed patterns, daytime and nighttime takeoffs, daytime and nighttime landings, and daytime and nighttime total operations.

**4.2.4.2.** The following information should be used in calculating the daily operations for the Based Aircraft Operations form (AF Form 3999):

**4.2.4.2.1. Operation** is defined as either one departure, one approach, or half of a closed pattern.

**4.2.4.2.2. Approach** is defined as a landing operation which may or may not be flown multiple times. An aircraft can approach to a full stop, a touch-and-go, or to a low approach and climbout.

**4.2.4.2.3. Departure** is considered to be any non-closed pattern takeoff on a runway.

**4.2.4.2.4. Arrival** is considered to be any non-closed pattern landing or low approach to a runway.

**4.2.4.2.5. Closed Pattern** (flown as multiple approaches) is comprised of a departure segment and a approach segment usually flown on the same runway. In some cases, a closed pattern may depart from one runway and land on or approach a second runway. Keep in mind, each closed pattern is actually two operations, a departure from either a full stop, low approach or touch-and-go and a approach to either a full stop, low approach or touch-and-go into another pattern.

**4.2.4.2.6. Total Takeoffs** are composed of all the departure operations plus the closed pattern departure segment operations. Takeoffs = Departures + Closed Patterns Departure Segments

**4.2.4.2.7. Total Landings** are composed of all the arrival operations plus the closed pattern approach segment operations. Landings = Arrivals + Closed Patterns Approach Segments

**4.2.4.2.8. Total operations** are the sum of the landing and the takeoff operations. In essence, one departure counts as an operation, one approach counts as an operation, and one closed pattern counts as two operations. Total Operations = Takeoffs + Landing

**4.2.4.2.9. Sortie** is an aircraft flight consisting of one departure, one approach, and any number of closed patterns. Sorties can be referred to as mission sorties, local sorties, air refueling sorties, proficiency sorties, etc. Please note that one sortie is made up of more than one operation. Without clarification, knowing the number of sorties per day does not provide enough information to determine the number of operations per day. Be sure to discount those operations flown at other locations.

**4.2.4.2.10. Daytime,** for the purposes of noise modeling**,** is defined as the period from 0700 to 2200, except in California where it is 0700 to 1900.

**4.2.4.2.11. Nighttime** is defined as the period from 2200 to 0700 hours. Because noise occurring at night is more disruptive, a 10 dB penalty or weighting is applied to the noise level of flights occurring during this time period.

**4.2.4.2.12. Evening** is the period of time from 1900 to 2200 hours. The state of California requires a day to be divided into three time periods for noise modeling purposes: daytime, evening, and nighttime. California considers daytime as the period of time from 0700 to 1900 hours. In addition to the 10 dB penalty applied to nighttime operations (2200-0700 hours), a 5 dB penalty or weighting is applied to the noise of operations occurring during evening hours.

**Figure 4.3. Sample AF Form 3999, Based Aircraft Operations.**

| BASED AIRCRAFT OPERATIONS | | | INSTALLATION Yourbase AFB TX | | | DATE (YYYY MM DD) 1998 01 01 | |
|---|---|---|---|---|---|---|---|
| AIRCRAFT TYPE | ENGINE TYPE | NUMBER OF AIRCRAFT [1] | FLYING DAY PER YEAR | DAILY OPERATIONS | | | TOTAL [2] DAILY OPERATIONS |
| | | | | DEPARTURES | ARRIVALS | CLOSED PATTERNS | |
| C-130 | T56-A-15 | 2 | 5 | 1.11 | 1.11 | 2.110 | 6.440 |
| C-141 | TF33-P-7 | 5 | 5 | 0.84 | 0.84 | 24.860 | 51.400 |
| VC-135 | TF33-P-5 | 6 | 5 | 1.00 | 1.00 | 6.000 | 14.000 |
| C-12 (USMC) | PT6A-41 | 4 | 5 | 3.46 | 3.46 | 0.000 | 6.920 |
| C-12 (USN) | PT6A-41 | 4 | 5 | 2.50 | 2.50 | 3.900 | 12.800 |
| C-21 (FSA) | TFE731-2 | 2 | 5 | 2.00 | 2.00 | 1.000 | 6.000 |
| C-21 (USAF) | TFE731-2 | 2 | 7 | 3.90 | 3.90 | 2.880 | 13.560 |
| C-21 (TX ANG) | TFE731-2 | 4 | 5 | 2.50 | 2.50 | 3.400 | 11.800 |
| C-22 | JT8D-7 | 3 | 5 | 1.50 | 1.50 | 2.000 | 7.000 |
| UH-1N | T400-CP-400 | 17 | 5 | 16.00 | 16.00 | 36.000 | 104.000 |
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1. NUMBER OF AIRCRAFT USED IN CALCULATING THE DAILY OPERATIONS.
2. TOTAL DAILY OPERATIONS = DEPARTURES + ARRIVALS + (2 X CLOSED PATTERNS).

**AF FORM 3999, AUG 98 *(EF-V1)***

**4.2.4.3.** It is imperative that information regarding both day and night operations be collected. If evening operations are applicable, information regarding operations during this time period should also be obtained and collected.

**4.2.5. The Average Busy Day Concept.** At an installation, the number of assigned, transient, and civil aircraft operations will usually vary from day to day. BASEOPS requires that the number of operations for aircraft flying at the installation be entered as a specific number of operations per day. The Air Force does not follow the Federal Aviation Administration in its use of the "average annual day" in which annual operations are averaged over an entire 365-day year. The Air Force also does not use the "worst-case day" since it typically does not represent the normal noise exposure either. Air Force uses the "average busy day" concept, in which the operations entered into BASEOPS represent the average number of operations that could occur on "routine, busy days." Non-flying days (for example, weekends or holidays) are not used in computing the "average busy day" operations.

**4.2.5.1.** For each assigned, transient, or civil aircraft flying at an installation, compute the number of "annual busy day" operations by first determining the total yearly operations for the aircraft at the installation. For assigned aircraft, each squadron usually maintains records of its sorties. Using the sortie count and information furnished by flying squadron personnel during the interview process, the sortie records for the squadron can be used to compute the total yearly operations for the aircraft. Once the total yearly operations for the assigned aircraft have been determined, the "average busy day" operations for the aircraft are computed by dividing the total yearly operations by the number of flying days in a year. The operations for the "average busy day" can be further separated into daytime and nighttime (and evening, if required) operations based upon information furnished during the interview process.

**4.2.5.1.1.** Information on transient and civil aircraft operations can be obtained by examining monthly transient reports such as Transient Alert logs, AMC terminal reports, maintenance depot records, or, for joint use airfields, the commercial airline schedules. Using these reports, determine the "annual average day" operations for each transient or civil aircraft by first computing its total yearly operations at the installation and then dividing the total by 365.

**4.2.5.2.** There are occasionally exceptions that require some special handling to determine the yearly operations. This usually occurs because of heavy flying activity caused by events such as special exercises or escalated mission operations. Yearly operations may also be affected by events such as runway repairs. During the interview process determine if operations for the past year have been the norm or an exception.

**4.2.5.3.** The "annual average day" must be determined for each type of aircraft using the installation's runways. The information you arrive at should correlate with an average day based on the Air Traffic Control's yearly count.

**4.3 Data Collection Process.** With an understanding of the various types of operational data that need to be collected, the process for collecting the data is now discussed.

**4.3.1.** The first set of interviews should be with Radar Control, Air Traffic Control, and Base Weather Office. Information from Radar Control and Air Traffic Control will be needed when interviewing the Flying Squadrons. other interviews needed are with Transient Alert and Military Airlift Schedulers. Following is the type of information they can provide:

**4.3.1.1. Base Weather** - Local Climatological Data Summaries that will let you determine the average monthly temperature and relative humidity needed by NOISEMAP.

**4.3.1.2. Radar Control** - Details on known flight restrictions or avoidance areas, the Standard Instrument Departures (SID), Instrument Flight Rule (IFR) arrivals, and any hard altitude restrictions. Additional information needed includes dimensions, heading and altitudes of the IFR patterns at the installation. Radar Control can also provide reports of number of transient aircraft doing instrument approaches. These reports can be used as "sanity checks" against operational data gathered from the interviews with flying organizations.

**4.3.1.3. Air Traffic Control** - Information on Visual Flight Rule (VFR) arrivals and departures, the VFR entry points, and the dimensions, headings and altitudes of the VFR patterns. Although no written records are kept on patterns done by transient aircraft, the Tower can provide the best estimate on the type and number of patterns done by transient aircraft including aircraft using the installation runways for proficiency work only (some of these transients do not land and are not serviced by Transient Alert). Air Traffic Control can also provide copies of monthly or yearly tower counts. These reports will be used as a "sanity check" to substantiate operational data gathered from interviews with flying organizations. If differences exist determine the reason for the discrepancies and document the rational for utilizing the data in the report.

**4.3.1.3.1.** The operational counts should also be compared to operational counts described in previous AICUZ studies.

**4.3.1.4. Transient Alert** - maintains a log of every transient aircraft making a full stop and serviced at the installation. Transient Alert can provide a copy of the log that identifies transient aircraft by type and the time it arrives and departs from the base on a day by day basis. Review this list and ask questions about aircraft which are unfamiliar (engine type and number of engines).

**4.3.1.5. Military Airlift Schedulers** - A copy of a log, the Monthly Station Traffic Handling Report, that identifies military airlift aircraft by type and time it arrives and departs from the base on a day by day basis.

**4.3.2. Assigned Aircraft.** Each flying squadron should be interviewed to find out where they fly, how they fly and how often they fly. The primary source of information for assigned aircraft are the Stan/Eval pilots and the squadron schedulers. They know the typical flying activities of their unit. The following should be noted by the data collector.

**4.3.2.1.** Aircraft model and type of engine

**4.3.2.2.** Number of primary assigned aircraft

**4.3.2.3.** The number of flying days per month

**4.3.2.4.** The frequency and schedules of special exercises that occur

**4.3.2.5.** The percent Runway Use

**4.3.2.6.** Any Runway displacement

**4.3.2.7.** The number of sorties flown in an average day or week and what type of sorties are flown ( example of sortie types: Airlift support, refueling support, mission, local, low level, closed pattern proficiency work, etc.). Each type of sortie should be investigated to determine the types and numbers of operations involved. Remember: one sortie is composed of more than one operation (one departure, one arrival, and a number of closed patterns). To better determine the operations information you will need:

**4.3.2.7.1.** The percentage of sorties that return to airfield and practice multiple approaches. Determine the types of patterns flown and how many.

**4.3.2.7.2.** The percentage of training sorties (aircraft stay at airfield to practice multiple approaches only).

**4.3.2.8.** The percent of sorties that depart and/or arrive between 2200 and 0700 hours.

**4.3.2.9.** The percentage of departures that are standard instrument departures (SID) and the percentage that the pilot is usually given clearance to fly direct

**4.3.2.10.** The percentage of departures in afterburner (if so equipped) or reduced thrust

**4.3.2.11.** The percentage of arrivals that are straight-in full stop. The arrivals may consist of an instrument approach (PAR, ASR, ILS, TACAN, VOR, NDB) or a visual (VFR) approach to a straight-in full stop

**4.3.2.12.** The percentage of arrivals that include a pitchout or overhead approach and the percent of these arrivals that must re-enter

**4.3.2.13.** Any special maneuvers required (Simulated Flameout (SFO), Functional Check Flights (FCF), etc.)

**4.3.3.** The term **flight profile** refers to the power settings, airspeeds, altitudes, and track distances used on a flight segment by the pilot. One of the advantages in using the NOISEMAP program is custom profiles flown at a base can be input into BASEOPS rather than using some "standard" way of flying. The result leads to more accurate contour predictions. This additional accuracy requires the user to supply detailed flight profile data for each segment of each flight track. The following explains technical terms used in pilot interviews:

**4.3.3.1. Track distance** refers to the cumulative distance measured from either departure end of runway or approach end of runway to the location of the aircraft. It is a 2 dimensional representation of the actual three-dimensional flight track.

**4.3.3.2. Distance** for flight tracks is usually measured in terms of **nautical miles** (NM). For conversion purposes, 1 NM =6080 feet but typically rounded to 6000 feet). The distance is usually measured from either the runway or a navigational aid (NAVAID).

**4.3.3.3. Distance Measuring Equipment** (DME) distance is the distance an aircraft is from a navigational aid (NAVAID). In order to use the DME distance, you need to know which NAVAID the DME distance is measured from. The radial measured off the NAVAID further pinpoints the location of the aircraft. DME should not be used unless it is measured from a installation's NAVAID.

**4.3.3.4. Altitude** is another part of the flight profile that must be determined. Altitude must be entered into BASEOPS as Altitude Above Ground Level (**AGL**). Pilots will usually provide altitude information in terms of Altitude Above Mean Sea Level (**MSL**). Pilots generally give altitudes below 1000 feet AGL in terms of AGL and above 1000 feet AGL in MSL. For accuracy, ask the pilot if the altitude is AGL or MSL.

**4.3.3.5.** In order to get the flight profile information needed for BASEOPS input, interviews with the pilots must cover every flight track the aircraft flies. Establishing the exact location of flight tracks is a very important step in the data collection process since the contours are dependent on where, when, and how the aircraft fly each flight track.

**4.3.4.** All flight tracks and flight profile data describing how the aircraft actually flies in terms of power setting, airspeed, and altitude must be determined for assigned, transient, and civil aircraft operations. To collect this information it will be necessary to investigate (1) Departure Tracks, (2) Arrival Tracks and (3) Closed Patterns. When interviewing pilots focus on only one of these three types of tracks at a time. While analyzing a specific type of track, the following procedures are recommended:

**4.3.4.1.** Request the pilot draw each type of track (either departure, arrival, or pattern) on tracing paper over background map or directly on a copy of the background map, remembering to get headings and distances.

**4.3.4.2.** Ask for percent of runway usage. This should add up to 100 percent for each runway.

**4.3.4.3.** Determine the percentage of time each track is flown. This should add up to 100 percent for the type of track (departure, arrival, or pattern).
**4.3.4.4.** The percentage of operations on the track between 2200 and 0700 hours.
**4.3.4.5.** Remember to check to see if special procedures are performed such as Simulated Flameout (SFO) and Functional Check Flight (FCF).
**4.3.4.6.** Remember, there are two ends of a runway and you need flight track information and profiles for each runway end.
**4.3.4.7.** Once all the tracks of one type (departure, arrival, or pattern) are drawn, have the pilot place the specific flight profile information on each track. Each configuration change point (change in power setting, altitude, or airspeed) along the track should be marked.
**4.3.5.** The following details listed in Table 4.3 should be included in interviews regarding the specific type of track (departure, arrival, or pattern):

**Table 4.3. Questions on Flight Tracks.**

| |
|---|
| For Departures you will need to know: |
| If the pilot is required to perform a preflight check at the hammerhead of the runway. If so, determine the power setting of the engines and the length of time the check takes. This information will be entered into BASEOPS as an engine run-up at the hammerhead |
| The power setting of the aircraft at the runway threshold, immediately before brake release |
| The time aircraft is at this power before releasing brake |
| If the aircraft uses both Afterburner and Military Power or reduced thrust and full thrust departures, two separate power settings and airspeeds will be needed |
| If more than one profile (military, afterburner, reduced thrust) is used for departures, what percentage of the time each is done |
| Distance aircraft travels before rotating (lifting off). At this point you will need the power setting and airspeed |
| Altitude, power setting, and airspeed of the aircraft at the end of the runway |
| Distance to the next aircraft configuration change: Power changes (afterburner off, thrust reduced)<br>Change in rate of climb<br>Change in rate of airspeed<br>Altitude<br>Repeat this process until you have reached an altitude of 10,000 AGL or a minimum of 20 miles from the base. (The exception to the 20 mile rule would be an aircraft descent into other airspace; i.e., low-level route. In that case, level the aircraft at its highest altitude prior to entry.) At each configuration change point, get the altitude, power setting, and airspeed of the aircraft. |
| Determine if any special departure procedures are flown that were not disclosed.<br>Some examples include: Functional check flights<br>Live ordnance departures<br>Any other unordinary maneuvers |
| For Arrivals you will need to know: |
| Power setting, airspeed, and altitude as aircraft crosses runway threshold. |
| Location of each aircraft configuration change along the track.<br>For arrivals, this may include: When aircraft levels off<br>When aircraft intersects glide slope<br>When pilot puts power back<br>When pilot puts power up<br>When aircraft is one mile from approach end of runway<br>When aircraft reaches initial and/or final approach fix<br>When aircraft begins descent into local airspace<br><br>Remember: You will need the power setting, airspeed and altitude at each configuration change point. |
| Remember to check if there are other specialized maneuvers that were not disclosed, such as circling approaches or simulated flameout's |
| If more than one profile (precision, non-precision,) is done, what percentage is each |
| For VFR arrivals, you will need a percentage for overhead versus straight-in full stops, if applicable |
| For Closed Patterns, you will need to know |
| The type of closed pattern flown. There can be several types of closed patterns because of the many type of approaches or maneuvers pilots are required to practice. Some examples are:<br>Closed Inside Downwind (usually a racetrack).<br>Closed Outside Downwind (also called a Reentry Pattern). This pattern will sometimes have a dogleg to a straight-in visual or to a pitchout.<br>Rectangular Pattern (also called Conventional or simply VFR pattern). This pattern is similar to a closed inside downwind except |

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|---|
| crosswind and base legs consist of four 90 degree turns and usually a short final.<br>Radar pattern (may be called Successive IFR Pattern, Repetitive Ground Control Approach (GCA) Pattern). This pattern is flown with Instrument Flight Rules (IFR).<br>Multiple VOR or TACAN approaches are considered closed patterns, not arrivals. |
| The width of the pattern. |
| Distance to each aircraft configuration change. For closed patterns, this may include:<br>If aircraft touches down and rolls before lifting off (touch-and-go), you will need the distance of the roll and the power and airspeed when lifting off.<br>If aircraft makes a low approach, you will need the distance traveled at the lowest altitude before beginning climb. You will need the power, airspeed, and altitude at the point where the climb begins.<br>Change in rate of climb.<br>Change in rate of airspeed (either a gain or loss).<br>When level-off at pattern altitude is reached.<br>When descent from pattern altitude begins.<br>When aircraft configures for approach.<br>The power and airspeed at approach end of runway.<br><br>Remember: You will need the power setting, airspeed and altitude at each change. |
| If more than one profile (precision, non-precision, visual straight-in) is done on a closed pattern, what percentage of the time is each done |

**4.3.6. Helocopter Aircraft.** At some Air Force installations, a helicopter unit is stationed on or adjacent to the installation. A visit to the helicopter unit is required to obtain information on the unit's flying activities. Data collection for helicopter information can be obtained using the same procedures used for gathering information on fixed-wing aircraft. The helicopter data is recorded on the same data sheets as the fixed-wing aircraft.

**4.3.7. Transient and Civil Aircraft.** For transient aircraft, you will have to rely on the logs maintained by Transient Alert and the closed pattern estimates Air Traffic Control can provide. The arrival and departure tracks used by transient and civil aircraft can be obtained from Radar Control and Air Traffic Control. The logs obtained from Transient Alert and Military Airlift should provide information on frequency of civil and transient military daily operations. In the case of joint use airports, the Official Airline Guide (OAG) provides operations for each commercial aircraft as a function of time of day. The OAG contains information on the type of aircraft flown and the dates and times of arrival and departure. Through the interview process, the Aero Club management can usually provide information regarding the frequency of the club's daily operations. When collecting the operations data for any of the these aircraft, determine the number of flying days per week or month.

**4.3.7.1.** Flight profile information will also need to be determined, if possible. Aero Club information can usually be obtained from the Aero Club manager. You would follow the same interview process you used for the assigned aircraft. The NOISEMAP program has default flight profile information which can be used for transient and civil aircraft. However, when using the default profiles, you need to remember that it is generic data. Flight segment distances and altitudes may vary at the installation and will need to be changed on the default profiles.

**4.3.7.2.** Once daily operations are calculated for the transient aircraft, enter the information on the Transient Aircraft Operations Form, AF Form 4000 (See sample data in Figure 4.4).

**Figure 4.4. Sample AF Form 4000, Transient Aircraft Operations.**

| **TRANSIENT AIRCRAFT OPERATIONS** | INSTALLATION Yourbase AFB TX | | | DATE *(YYYY MM DD)* 1997 12 25 |
|---|---|---|---|---|
| TRANSIENT AIRCRAFT OPERATIONS ARE CALCULATED USING 365 FLYING DAYS PER YEAR | | | | |
| AIRCRAFT TYPE [1] | DEPARTURES PER DAY | ARRIVALS PER DAY | CLOSED PATTERNS PER DAY [2] | TOTAL DAILY [3] OPERATIONS |
| A-10 | 0.240 | 0.240 | 0.000 | 0.480 |
| C-5 | 0.440 | 0.440 | 0.000 | 0.880 |
| C-9 | 2.240 | 2.240 | 0.000 | 4.480 |
| C-21 | 5.340 | 5.340 | 0.000 | 10.680 |
| C-130 | 1.720 | 1.720 | 0.000 | 3.440 |
| C-141 | 2.280 | 2.280 | 0.000 | 4.560 |
| F-15 | 0.200 | 0.200 | 0.050 | 0.500 |
| F-16 | 0.460 | 0.460 | 0.100 | 1.120 |
| T-1 | 0.200 | 0.200 | 0.000 | 0.400 |
| 2-Engine Prop | 0.400 | 0.400 | 0.000 | 0.800 |
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1. A transient aircraft may be grouped with similar aircraft in an appropriate category if its daily operations are less than 0.50.
2. Information on which transient aircraft fly closed patterns can be obtained by interviewing Air Traffic Control personnel.
3. Total Daily Operations = Arrivals + Departures + (2 x Closed Patterns).

**AF FORM 4000, AUG 98 *(EF-V1)***

**4.3.8. Flight Track and Profile Data.** All flight tracks must be determined for the assigned, transient, and civil aircraft operations. Establishing the exact location of flight tracks is a very important step in the operational data collection process since the noise contours are dependent on where the aircraft flies. The credibility of the AICUZ would be in question if the report fails to represent a track where aircraft actually do fly. The interview process described above should include all the flight tracks. Once this information has been gathered, the information must be transferred to AICUZ data sheets for entry into BASEOPS.

**4.3.8.1. Flight Track Sketches.** All flight tracks must be sketched onto separate Flight Track and Flight Profile Data Sheet, AF Form 3999. An example of a departure track is shown in Figure 4.5. It is necessary to provide track sketches along with track distances for each segment of the flight path. When completing the Flight Track sketches, the following information must be identified on the data sheet:

**4.3.8.1.1.** The runway used for the flight track.

**4.3.8.1.2.** The type of flight track (departure, arrival, closed pattern)

**4.3.8.1.3.** The 4-character flight track identification label (discussed below in 4.3.8.2)

**4.3.8.1.4.** A sketch of the flight track including magnetic headings (or angle, if known), radii of turns, and distances on each leg of the track.

**4.3.8.1.5.** A brief written description of the flight track.

**4.3.8.1.6** Once the flight track sketch is drawn and labeled with the above information, copies of the track should be made--one copy for each aircraft type that flies the track. For each aircraft using the track, a copy of the AF Form 4001, Flight Track and Profile (Figure 4.5) should be used to identify the following data about the flight profile flown on the track:

**4.3.8.1.6.1.** The type of aircraft

**4.3.8.1.6.2.** Location of each configuration change point along the track

**4.3.8.1.6.3.** At the configuration change point, give the cumulative distance along the track measured in the following way:

**4.3.8.1.6.3.1.** On departures, cumulative distance is measured from the beginning of the runway or break release point.

**4.3.8.1.6.3.2.** On arrivals, cumulative distance is measured from the approach end of the runway. This distance is measured backwards from the way the track is flown.

**4.3.8.1.6.3.3.** On closed patterns, cumulative distance is measured from the beginning of the runway, since the departure portion of the pattern will be entered into BASEOPS first.

**4.3.8.1.6.4.** At the configuration change point, give the altitude, power setting, and airspeed of the aircraft.

**4.3.8.1.6.5.** The daytime and nighttime daily operations for the aircraft on this track (also evening operations for California installations).

**4.3.8.1.6.6.** A four-character alphanumeric label to identify the aircraft flight profile on the track.

**Figure 4.5. Sample AF Form 4001, Flight Track And Profile .**

| FLIGHT TRACK AND PROFILE | INSTALLATION | | DATE *(YYYY MM DD)* |
|---|---|---|---|
| | Yourbase AFB TX | | 1995 05 15 |
| TRACK TYPE *( X one)*: | ARRIVAL | X DEPARTURE | CLOSED PATTERN |
| RUNWAY | AIRCRAFT TYPE | FLIGHT TRACK ID | PROFILE ID |
| 05 | F-15C | 05D2 | C151 |

TRACK DESCRIPTION AND COMMENTS
Standard departure to the North

**AF FORM 4001, AUG 98** ***(EF-V1)***

**Figure 4.5. Continued.**

| FLIGHT TRACK AND PROFILE | | INSTALLATION Yourbase AFB TX | | | DATE (YYYY MM DD) 1995 05 15 |
|---|---|---|---|---|---|
| AIRCRAFT/ENGINE TYPE | FLIGHT TRACK ID | PROFILE ID | DAILY OPERATIONS | | |
| | | | DAY | EVENING [1] | NIGHT |
| F404-GE-400 | 05D2 | C151 | 0.23 | N/A | 0.0 |
| PROFILE DESCRIPTION AND COMMENTS | Afterburner Departure | | | | |
| POWER UNITS %NC | LANDING DISPLACEMENT [2] None | TAKEOFF DISPLACEMENT None | STATIC RUNUP DURATION [3] 5 Seconds | | |

| SEGMENT IDENTIFIER | CUMULATIVE DISTANCE (IN FEET) | ALTITUDE (IN AGL) | POWER SETTING | AIRSPEED (KIAS) | A/B (Y/N) | CLEAN (Y/N) |
|---|---|---|---|---|---|---|
| A | 0 | 0 | 91 | 0 | N | N |
| B | 2500 | 0 | 91 | 160 | N | N |
| C | 10000 | 800 | 90 | 300 | N | Y |
| D | 50000 | 4787 | 94 | 350 | Y | Y |
| E | 105000 | 9787 | 94 | 350 | N | Y |
| F | 200000 | 10287 | 75 | 350 | N | Y |
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1. USED TO COMPUTE CNEL.
2. IF NEEDED.
3. NEEDED ON DEPARTURE PROFILES ONLY.

**AF FORM 4001, AUG 98** ***(EF-V1)(Reverse)***

**4.3.8.2. Labeling Flight Tracks.** For entry into BASEOPS, each flight track is labeled. The flight track designator is a four-character alphanumeric code to identify the track. The preferred procedure for labeling tracks is as follows:

**4.3.8.2.1.** The **first two characters** identify the runway. For parallel runways drop the 10's digit and use the 1's digit with an L (left), R (right) or C (center).

**4.3.8.2.2.** The **third character** identifies the flight track type. **D** for departures, **A** for arrivals, and **C** for closed patterns.

**4.3.8.2.3.** The **fourth character** will simply be the number of the flight track in sequential order. Use digits 1-9 and 0 and then A-Z in the fourth character.

**4.3.8.2.4.** Using this procedure, track **21C2** would indicate a second closed pattern on runway 21. Track **09AC** would represent an arrival track on runway 09 (the thirteen arrival track on that runway). If an installation has three parallel runways identified by 21R, 21L and 21C, track **1CD4** would represent a departure track on runway 21C.

**4.3.8.3. Determining Daily Operations on Flight Tracks.** The daily operations need to be determined for each flight track profile. This is calculated from the information gathered during the interview process. Special care needs to be used if a flight track has more than one profile on it for one aircraft type. For example, (1) the aircraft departs in both afterburner and military power, (2) the aircraft uses straight-in and circling approaches on the track or (3) the aircraft flies both precision and non-precision multiple approaches on the closed patterns. If a track has more than one profile for an aircraft, that will need to be included when calculating the aircraft's daily operations.

**4.3.8.3.1.** Additional information gathered during the interview process is used to determine the daily operations on each flight profile. From the information given on sorties and percentage of use for both runways and tracks, the average daily operations can be calculated for the various departures, approaches and closed patterns. This information includes:

**4.3.8.3.1.1.** Runway split (the percentage of time one runway is used over another).

**4.3.8.3.1.2.** Nighttime and daytime operations. Sometimes specific information can be gathered on nighttime flying frequency. Sometimes a percentage is used to determine nighttime operations.

**4.3.8.3.1.3.** Mission requirements. For example, one squadron may do 80% of their sorties away from the base (counted as arrivals and departures only), while 20% of their sorties are local proficiency sorties (counted as closed patterns).

**4.3.8.3.1.4.** Off station sorties.

**4.3.8.3.2.** Daily operations for transient and military airlift aircraft must also be determined. The logs obtained from Transient Alert and Military Airlift should provide information on frequency of civil and transient military daily operations. In the case of joint use airports, the Official Airline Guide (OAG) provides operations for each commercial aircraft as a function of time of day. When calculating the daily operations for any of these aircraft, remember to determine the number of flying days per week or month the aircraft could fly at the installation. Information obtained from the Aero Club management can usually provide information from which the frequency of the club's daily operations can be calculated.

**4.3.8.3.3.** Once the daily operations for each flight track profile flown by each aircraft is determined it should be recorded on the profiled flight track sketch. It also will be recorded on the Flight Track Inventory Data Sheet.

**4.3.8.4. Flight Track Inventory Data Sheet.** The AF Form 4002, Flight Track Inventory (See example in Figure 4.6) is a summary of the operations per flight track, itemized on a runway by runway basis. A separate data sheet should be prepared for each runway. These data sheets indicate the number of daily operations during both daytime and nighttime hours for each track. All departures, approaches, and closed patterns should be included on these sheets, remembering a flight track may have more than one profile. All aircraft, (assigned, transient and civil) should be included on these flight track inventory sheets.

| FLIGHT TRACK INVENTORY FOR RUNWAY 05 | | | | | | | INSTALLATION Yourbase AFB TX | | | | | | DATE (YYYY MM DD) 1998 09 30 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TRACK DESCRIPTION | From East through Nottingham via Radar | | From North | | From South / West through IRONS | | Straight In | | | | | | | |
| TRACK ID | 1lA1 | | 1LA2 | | 1LA3 | | 1LA4 | | | | | | | |
| AIRCRAFT TYPE | OPERATIONS | | | | | | | | | | | | | |
| | DAY | NIGHT | DAY | NIGHT | DAY | NIGHT | DAY | NIGHT | DAY | NIGHT | DAY | NIGHT | DAY | NIGHT |
| C-130 | | | 0.020 | 0.000 | 0.200 | 0.000 | 0.100 | 0.000 | | | | | | |
| C-141 | | | 0.080 | 0.000 | 0.080 | 0.000 | | | | | | | | |
| C-135 | 0.180 | 0.020 | | | 0.070 | 0.010 | | | | | | | | |
| C-12 (USMC) | | | 0.020 | 0.000 | 0.060 | 0.010 | | | | | | | | |
| C-12 (Navy) | | | 0.610 | 0.070 | 0.360 | 0.040 | | | | | | | | |
| C-21 (USAF) | 0.290 | 0.020 | 0.290 | 0.010 | 0.280 | 0.030 | | | | | | | | |
| C-21 (TX ANG) | | | 0.380 | 0.000 | 0.250 | | | | | | | | | |
| C-22 (TX ANG) | | | 0.220 | 0.000 | 0.150 | 0.000 | | | | | | | | |
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AF FORM 4002, AUG 98 *(EF-V1)*

THIS PAGE FOR DNL USE

**Figure 4.6. Sample AF Form 4002, Flight Track Inventory.**

Figure 4.6. Continued.

| FLIGHT TRACK INVENTORY FOR RUNWAY | | | | INSTALLATION | | | | DATE *(YYYY MM DD)* | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TRACK DESCRIPTION | | | | | | | | | | | | | | | | | |
| TRACK ID | | | | | | | | | | | | | | | | | |
| AIRCRAFT TYPE | OPERATIONS | | | | | | | | | | | | | | | | |
| | DAY | EVENING | NIGHT | DAY | EVENING | NIGHT | DAY | EVENING | NIGHT | DAY | EVENING | NIGHT | DAY | EVENING | NIGHT | | |
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AF FORM 4002, AUG 98 *(EF-V1) (Reverse)*

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**4.3.9. Aircraft Maintenance and Engine Ground Run-ups.** Engine maintenance can be a significant source of noise. In order to predict the contributions of ground run-up activities, obtain information on both in-frame and out-of-frame engine testing. Two types of data need to be acquired. The first type include the locations of the ground run-ups and the direction of the nose of the aircraft at each location. The second set of data is a summary of the ground run-up procedure including the duration of each run-up as a function of power setting and the number of operations (daytime and nighttime). Aircraft maintenance personnel responsible for engine runs should be interviewed to find out where and how often maintenance work is performed. The following information should be obtained by the data collector:

**4.3.9.1.** Aircraft model and type of engine and number of engines on the aircraft.

**4.3.9.2.** The locations and headings (direction of the nose of the aircraft) where engine maintenance runs are done( this should be marked on a base map).

**4.3.9.3.** Test Cell, Test Stand, or Hush House locations (also marked on the base map).

**4.3.9.4.** Any special locations for power runs and any noise suppression used.

**4.3.9.5.** The maximum power the aircraft is permitted or authorized to run at in parking spots.

**4.3.9.6.** If engines require warm-up prior to flight or prior to maintenance runs.

**4.3.9.7.** If engines require cool down after flight or after maintenance runs.

**4.3.9.8.** If an engine requires scavenge (momentary increase in engine power prior to engine shutoff, required to expel burned gases or other substances from engine cylinders).

**4.3.9.9.** Establish the types of maintenance runs. These may include:

**4.3.9.9.1**. Operational Checks (Idle Runs) such as: Starter and Operations Checks. Leak Checks. Oil and Fuel Pressure Checks. Hydraulic System Checks.

**4.3.9.9.2.** Electrical and Environmental System Malfunctions (Power Runs): Pressurization Malfunctions. System Component Checks. Electrical System Operational Checks.

**4.3.9.9.3.** Engine Performance Checks: Acceleration Checks. Engine Vibration Checks. Engine De-icing Checks. Alignment Checks.

**4.3.9.9.4.** Engine Replacement/Malfunctions and Pre/Post-flight Checks.

**4.3.9.10.** For each type of engine run, the following information is required:

**4.3.9.10.1.** Length, location, and number of engines used during the runs.

**4.3.9.10.2.** Power of each engine. Determine if one or more engines go to power while others stay at idle.

**4.3.9.10.3.** Number of times a day, week, month the run is performed.

**4.3.9.10.4.** The percent of the engine runs occurring between 2200 and 0700 hours.

**4.3.9.11.** Test cells and hush houses usually have their own crews and those individuals should be contacted and interviewed concerning the maintenance runs performed in these facilities.

**4.3.9.12.** Ground run-up locations and headings are recorded on AF Form 4003, Ground Run-up Locations (See the example in Figure 4.7). The Pad ID is any four-character alphanumeric designator that can be used in BASEOPS to identify the specific runup pad. If latitude and longitude is unavailable for the run-up pad, the coordinates of its location can be determined by measuring its distance from the first runway entered into BASEOPS (called the primary runway). Refer to the BASEOPS Users Manual for further information on measuring distances to locate run-up pads.

**4.3.9.13.** Data concerned with specific engine run-ups should be entered on the AF Form 4004, Engine Ground Run-up Summary Data Sheet (Figure 4.8). When entering the information into BASEOPS, the computer operator will assign a four-digit alphanumeric designator to the specific ground run-up procedure to identify it.

**Figure 4.7. Sample AF Form 4003, Ground Runup Locations.**

| GROUND RUNUP LOCATIONS | | | INSTALLATION Yourbase AFB TX | | DATE *(YYYY MM DD)* 1997 08 27 |
|---|---|---|---|---|---|
| IDENTIFIER | LOCATION DESCRIPTION | AIRCRAFT/ENGINE TYPE | X DISTANCE [1] OR LATITUDE | Y DISTANCE [1] OR LONGITUDE | AIRCRAFT HEADING *(MAGNETIC)* |
| HH | Hush House | F-16, A-10 | 0 | -3100 | 155.00 |
| HAM | Hammerhead RW 05 | F-16/F100-PW-229 | -290 | -470 | 130.00 |
| TP | Trim Pad | F-16, A-10 | -3820 | -3300 | 265.00 |
| Dock | Nose Dock | A-10 | 2410 | -1230 | 265.00 |
| TAX3 | Taziway 3 | A-10 | -340 | -950 | 0.00 |
| A101 | Parking Spot | A-10 | 3510 | -1340 | 40.00 |
| A102 | Parking Spot | A-10 | 3510 | -1650 | 40.00 |
| A103 | Parking Spot | A-10 | 3510 | -1350 | 40.00 |
| A104 | Parking Spot | A-10 | 3510 | -1670 | 40.00 |
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1. DISTANCE MEASURED FROM THE AIRFIELD REFERENCE POINT.

**AF FORM 4003, AUG 98** ***(EF-V1)***

**Figure 4.8. Sample AF Form 4004, Engine Ground Runup Summary.**

**ENGINE GROUND RUNUP SUMMARY**

INSTALLATION: Yourbas AFB TX

DATE (YYYY MM DD): 1993 04 08

| | | | POWER SETTING | NO. OF ENGINES RUNNING | DAILY OPERATIONS* PER PAD | | | DURATION IN SECONDS |
|---|---|---|---|---|---|---|---|---|
| PROFILE ID | C5A - C5F | | | | DAY | EVENING[1] | NIGHT | |
| RUNUP LOCATION | C51 - C56 | | | | | | | |
| AIRCRAFT TYPE | C-5 | SUPPRESSION: | 2.0 | 4 | 2.06 | | | 810 |
| ENGINE TYPE | TF-39 | | | | | | | |
| POWER UNITS | EPR | NONE | | | | | | |

TYPE OF RUNUP
Preflight / Post-flight
Warm-up / Cool Down

HOW OFTEN IS THIS DONE?
Every sortie (3.1 per day)
No night ops

| | | | POWER SETTING | NO. OF ENGINES RUNNING | DAILY OPERATIONS* PER PAD | | | DURATION IN SECONDS |
|---|---|---|---|---|---|---|---|---|
| PROFILE ID | C5G - C5M | | | | DAY | EVENING[1] | NIGHT | |
| RUNUP LOCATION | C51 - C56 | | | | | | | |
| AIRCRAFT TYPE | C-5 | SUPPRESSION: | | 2 | .03 | | .01 | 600 |
| ENGINE TYPE | TF-39 | | | 4 | .03 | | .01 | 300 |
| POWER UNITS | EPR | NONE | | | | | | |

TYPE OF RUNUP
Trouble-shooting

HOW OFTEN IS THIS DONE?
4 per month

35% night ops

| | | | POWER SETTING | NO. OF ENGINES RUNNING | DAILY OPERATIONS* PER PAD | | | DURATION IN SECONDS |
|---|---|---|---|---|---|---|---|---|
| PROFILE ID | C5N - C5S | | | | DAY | EVENING[1] | NIGHT | |
| RUNUP LOCATION | C51 - C56 | | | | | | | |
| AIRCRAFT TYPE | C5 | SUPPRESSION: | 2.0 | 2 | 0.03 | | .01 | 600 |
| ENGINE TYPE | TF-39 | | 4.0 | 2 | .03 | | .01 | 300 |
| POWER UNITS | EPR | NONE | | | | | | |

TYPE OF RUNUP
CSD Check

HOW OFTEN IS THIS DONE?
4 per month

35% night ops

| | | | POWER SETTING | NO. OF ENGINES RUNNING | DAILY OPERATIONS* PER PAD | | | DURATION IN SECONDS |
|---|---|---|---|---|---|---|---|---|
| PROFILE ID | | | | | DAY | EVENING[1] | NIGHT | |
| RUNUP LOCATION | | | | | | | | |
| AIRCRAFT TYPE | | SUPPRESSION: | | | | | | |
| ENGINE TYPE | | | | | | | | |
| POWER UNITS | | | | | | | | |

TYPE OF RUNUP

HOW OFTEN IS THIS DONE?

1. Used to compute CNEL.
*NOISE IN RUNUP DATABASE IS BASED ON **ONE** ENGINE ONLY. DAILY OPERATIONS = # OF ENGINES RUNNING X FREQUENCY PER DAY.

**AF FORM 4004, AUG 98 *(EF-V1)***

**4.4. Conclusion.** Once the data has been collected and inputted into BASOPS, the input summary files are printed out, tracks and ground run-up locations plotted out at the scale of the background map. The data then is reviewed, confirmed and coordinated on by the interviewee to ensure that the data is realistic and accurate. BASEOPS is a computerized program for entering operational data needed to compute the total noise exposure around an installation. The BASEOPS manual should be referred to for instructions on inputting the operational data. NOISEMAP is a group 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. The NOISEMAP manual should be referred to for instructions on the use of the program.

## Chapter 5

## ENVIRONMENTAL IMPACT ANALYSIS PROCESS (EIAP) FOR AIRCRAFT NOISE AROUND AIR FORCE INSTALLATIONS

**5.1. Introduction.** The National Environmental Policy Act (NEPA) was signed into law on 1 January 1970. NEPA establishes national environmental policy and goals for the protection, maintenance and enhancement of the environment, and it provides a process for implementing these goals within federal agencies.

**5.1.1.** The NEPA process evaluates the environmental effects of a Proposed Action, and alternatives. One of three levels of analysis and documentation is required, based on whether an undertaking can significantly affect the environment:

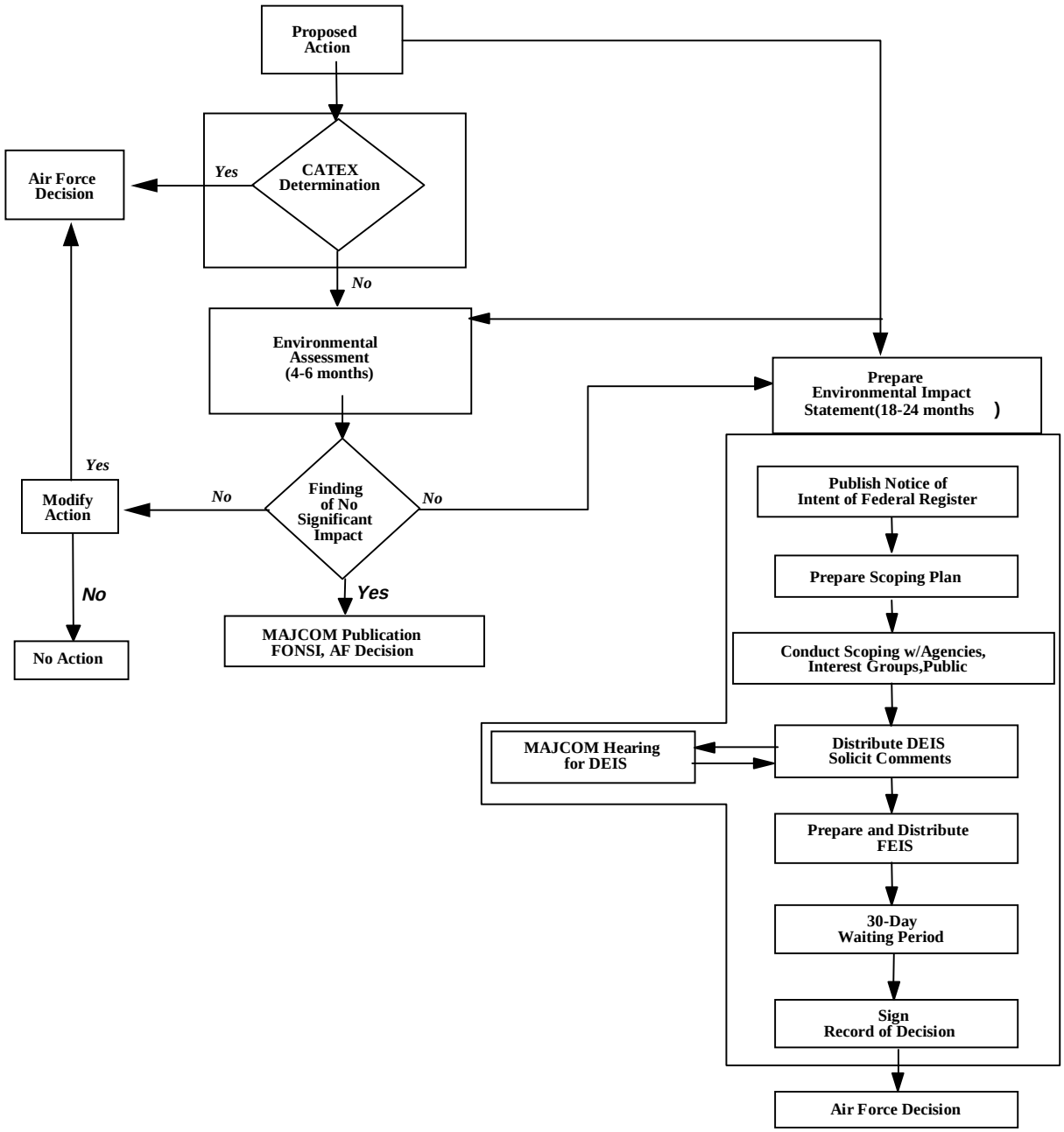
**5.1.1.1.** A Categorical Exclusion (CATEX) determination

**5.1.1.2.** Preparation of an Environmental Assessment (EA)

**5.1.1.3.** Preparation of an Environmental Impact Statement (EIS)

**5.1.2.** Air Force Instruction (AFI) 32-7061, the Environmental Impact Analysis Process (EIAP), describes the procedural requirements that must be followed by the Air Force in order to comply with NEPA. Figure 5.1 presents a block diagram of the major steps in this process.

**Figure 5.1. Environmental Impact Analysis Process.**




**5.2. Purpose.** The purpose of this chapter is to present an overview of the steps needed to complete the aircraft noise portion of an Environmental Assessment (EA) or Environmental Impact Statement (EIS), see Figure 5.2.

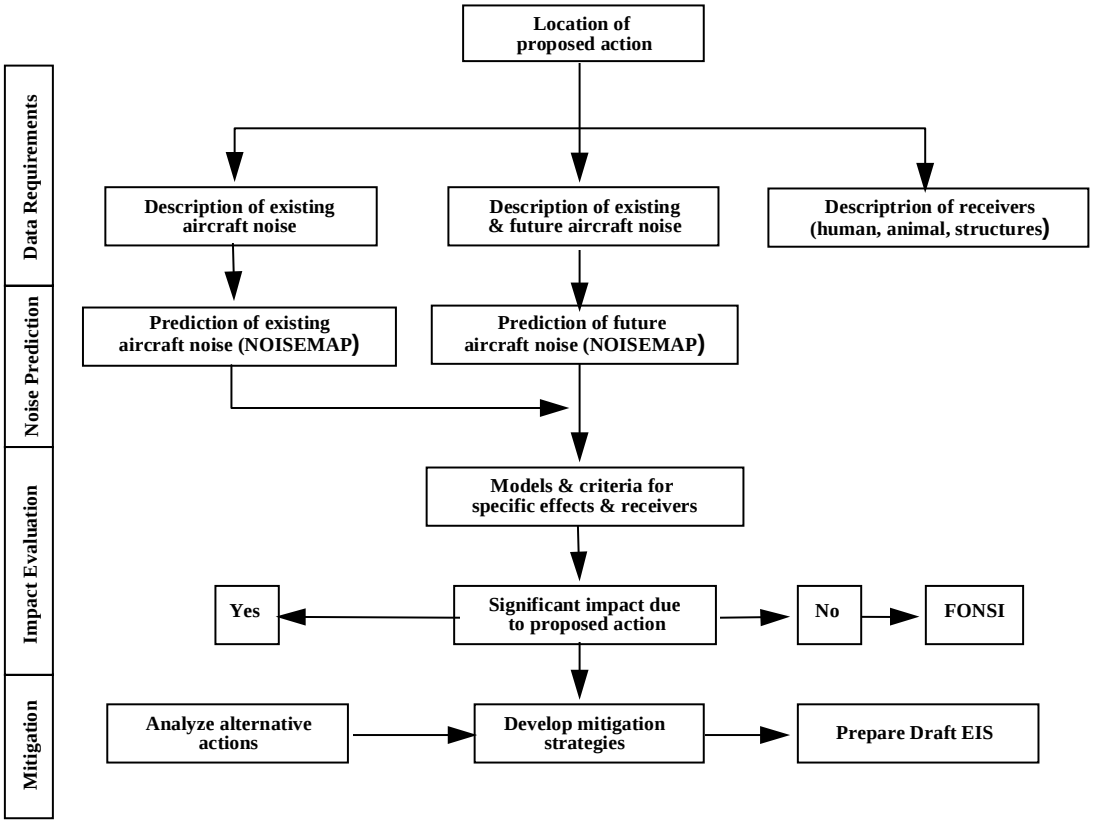
**5.2.1. Data Requirements.** EIAP purpose is to assess significant impacts of a proposed action on the existing environment. The first steps in the process are associated with defining the Proposed Action and alternatives, and identifying the data inputs required for the analysis (data collection phase). Two types of input data must be identified:

**5.2.1.1. Description of the aircraft noise.** Descriptions and analysis of the aircraft noise must be presented for both the existing conditions and the proposed action. When assessing an EIAP action, Air Force policy requires that existing (baseline) conditions be defined in a previously publicly-released noise contour map disseminated either through NEPA or AICUZ. The baseline data will be revalidated, to ensure accuracy, by using the data collection techniques described in Chapter 4 of this handbook.

**5.2.1.2. Description of the affected environment (receivers).** The second type of data input required in the problem definition phase of the analysis is a description of the affected environment, often referred to as the receivers. The affected environment category includes humans, animals and structures that may be affected by the change in the noise environment. In addition to humans, NEPA and the EIAP include animals (wild and domestic) and structures as receiver classes that must also be considered.

**Figure 5.2. General Overview of the Environmental Impact Analysis Process.**

**Figure 5.2 - General Overview of the Environmental Impact Analysis Process**




**5.2.2. Noise Prediction.** The prediction phase involves using the NOISEMAP computer program and the aircraft noise information for the proposed action to predict existing and future aircraft noise levels at receiver locations. NOISEMAP is used to perform noise exposure computations at specified locations and to develop the noise contours. Noise exposure predictions are presented in terms of Day-Night Sound Level (DNL).

**5.2.2.1.** The existing and future aircraft noise environments are compared to obtain the expected effect on the receivers. Effects on people include annoyance, sleep disturbance, and speech interference. Effects on animals include their ability to reproduce successfully or other concerns, as in the case of wildlife, or they may involve potential economic losses, as in the case of domestic animals such as cattle. Structural effects are normally associated with potential damage.

**5.2.3. Impact Evaluation.** When the existing and future effects are calculated, the differences are compared to establish the degree of change. The user must determine how many people, animals and/or structures will be affected by the proposed change within each noise contour range. The exposed population then must be evaluated against the available models to determine the effects for existing and future noise. Comparison of existing and future effects leads to a determination of impact. For example, the prevalence of annoyance model may predict that 20% of a population is "highly annoyed" by existing operations. Noise generated by the Proposed Action may result in a prediction that 28% of the population will be "highly annoyed." The resulting change is the predicted impact of the Proposed Action (i.e., 20% vs 28%). When this change is substantial, it becomes a significant impact and requires additional study of alternative actions. When the change is judged insignificant, then a Finding of No Significant Impact (FONSI) is made, as shown in Figure 5.2. An EIAP Handbook is planned to be developed to help the user evaluate the impacts.

**5.2.4. Mitigation.** A determination of significant impact typically requires that mitigation strategies be pursued in the form of alternative actions, and that steps associated with the preparation of an EIS be followed. This last phase of the process, noise mitigation, may take many forms. For aircraft noise, these strategies include changing a flight track, profile

and/or alignment, decreasing the number of operations, modifications to runway usage and avoiding flying during certain times of the day.

**5.2.4.1.** It is important to keep in mind that any mitigation strategy considered must first meet the operational requirements of the mission being evaluated. Thus, it is important that the environmental planner work closely with the airspace manager and/or the route planner when considering alternative actions.

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DCS/Installations & Logistics

## Attachment 1

## GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

***Abbreviations***

| | |
|---|---|
| AFB | Air Force Base |
| AFCEE | Air Force Center for Environmental Excellence |
| AFCEE/ECC | Air Force Center for Environmental Excellence/Design Group Division |
| AFCEE RCO | Air Force Center for Environmental Excellence Regional Compliance Office |
| AFH | Air Force Handbook |
| AFI | Air Force Instruction |
| AFJM | Air Force Joint Manual |
| AFMAN or AFM | Air Force Manual |
| AFPD | Air Force Policy Directive |
| AFR | Air Force Regulation |
| AFRES | Air Force Reserve |
| AGL | Above Ground Level |
| AICUZ | Air Installation Compatible Use Zone |
| ANG | Air National Guard |
| ANGRC | Air National Guard Readiness Center |
| APZ | Accident Potential Zones |
| BASEOPS | A computerized program for entering operational data needed to compute the total noise exposure around an installation. |
| CATEX | Categorical Exclusion |
| CNEL | Community Noise Equivalent Level |
| CZ | Clear Zones |
| dB | Decibel - unit of sound pressure. |
| DME | Distance Measuring Equipment |
| DNL | Day-Night Average Sound Level |
| DoD | Department of Defense |
| DoDI | Department of Defense Instruction |
| EA | Environmental Assessment |
| EAC | President’s Economic Adjustment Committee |
| EIAP | Environmental Impact Analysis Process |
| EIS | Environmental Impact Statement |
| EO | Executive Order |
| EPA | Environmental Protection Agency |
| EPC | Environmental Protection Committee |
| FAA | Federal Aviation Administration |
| FCF | Functional Check Flight |
| FHA | Farmers Home Administration |
| FICON | Federal Interagency Committee on Noise |
| FLIP | DoD Flight Information Publication |
| FMC | Federal Management Circular |
| FOA | Field Operating Agencies |
| FONSI | Finding of No Significant Impact |
| GIS | Geographic Information System |
| GS | Glide Slope |
| GSA | General Services Administration |
| HQ USAF | Headquarters, United States Air Force |
| HQ USAF/ILE | The Air Force Civil Engineer |
| HQ USAF/ILEV | The Air Force Civil Engineer Environmental Directorate |
| HQ USAF/ILEVP | The Air Force Civil Engineer Environmental Planning Division |
| HQ USAF/JA | The Air Force Judge Advocate General |
| HUD | Department of Housing and Urban Development |
| IEPB | Interim Environmental Planning Bulletin |

| | |
|---|---|
| IFR | Instrument Flight Rule |
| IICEP | Intergovernmental and Interagency Coordination for Environmental Planning |
| ILS | Instrument Landing System |
| IMP | Implementation and Maintenanc e Plan |
| INM | Integrated Noise Model |
| JLUS | Joint Land Use Studies |
| MAJCOM | Major Commands (USAF) |
| MOU | Memorandum of Understanding |
| MSL | Mean Sea Level |
| NAVAIDS | Navigational Aids |
| NEPA | National Environmental Policy Act of 1969 |
| NLR | Noise Level Reduction |
| NM | Nautical Mile |
| NOISEMAP | A group 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. |
| OAG | Official Airline Guide |
| OSD | Office of the Secretary of Defense |
| OSD/OEA | The Department of Defense, Office of Economic Adjustment |
| ROD | Record of Decision |
| SACOG | Sacramento Area Council of Governments |
| SAF/MI | Assistant Secretary of the Air Force for Manpower, Reserve Affairs, Installations and Environment |
| SAF/MIQ | Deputy Assistant Secretary of the Air Force (Environment, Safety, and Occupational Health) |
| SEL | Sound Exposure Level |
| SFO | Simulated Flameout |
| SID | Standard Instrument Departure |
| SLUCM | Standard Land Use Coding Manual |
| VA | Veterans Administration |
| VFR | Visual Flight Rule |

## Attachment 2

## DNL CONCEPT

**A2.1. Noise Environment Descriptor.** The noise contour methodologies used are the Day-Night Average Sound Level (DNL) and the Community Noise Equivalent Level (CNEL) for the state of California. These systems describe the noise environment. Efforts to provide a national uniform standard for noise assessment has resulted in adoption of DNL by the Environmental Protection Agency as the standard noise descriptor. The Air Force uses the DNL/CNEL descriptors in assessing the amount of aircraft noise exposure and as a metric for community response to the various levels of exposure. The DNL values used for planning purposes are 65, 70, 75, and 80 dB. The state of California uses CNEL and employs a 60 dB value in addition to the others. CNEL was developed for the state of California and is very similar to the DNL, except that it introduces an intermediate weighting for evening hours between 7:00 and 10:00 PM. The CNEL values are generally only slightly higher than DNL in most situations.

**A2.1.1.** A noise environment descriptor should consider the annoyance of a single event, the effect of repetition of such events and the time of day in which these events occur. The DNL and CNEL begins with a single event descriptor and adds corrections for the number of events and the time of day over a 24 hour period. Since the primary concern is residential, night-time events are considered more annoying than daytime events and are weighted accordingly.

**A2.2. Noise Event Descriptor.** The single event noise descriptor used in both the DNL and CNEL systems is the Sound Exposure Level (SEL). The SEL measure is an integration of the "A" weighted noise level over a period of a single event such as an aircraft flyover, in dB. Frequency, magnitude, and duration vary according to aircraft type, and power setting, therefore, individual aircraft noise data is collected for various types at different power settings and phases of flight.

**A2.2.1.** In addition to the assessment of aircraft flight operations, noise resulting from aircraft engine maintenance checks on the ground are incorporated. Data concerning the orientation of the noise source, type of engine, number of runs, the power settings, their duration, and use of suppression devices are collected. This information is processed and the noise contribution is added to the noise generated by flying operations to produce noise contours reflecting the overall noise environment.

**A2.3. Technical Information.** Additional information on DNL and CNEL procedures are available in the following publications:

**A2.3.1.** Community Noise Exposure Resulting from Aircraft Operations: Applications Guide for Predictive Procedure, AMRL-TR-73-105, November 1974 from National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22151.

**A2.3.2.** Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with Adequate Margin of Safety, EPA Report 550/9-74-004, March 1974, from Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

**A2.3.3.** Adopted Noise Regulations for California Airports, Title 4, Register 70, No. 48-11-28-70, Subchapter 6, Noise Standards.

**Attachment 3**

**ACCIDENT POTENTIAL ZONES**

**A3.1. Introduction.** When the AICUZ program first began, there were no comprehensive studies on accident potential. In support of the program, a study of Air Force accidents was accomplished. The initial study assessed aircraft data from 1968 to 1972 within 10 nautical miles of airfields. The study revealed that 369 accidents occurred within this area and 75% of these accidents occurred on or adjacent to the runway, in a corridor 3000 feet wide, and extending from the runway threshold along the centerline for a distant of 15,000 feet.

**A3.1.1.** Three zones were established based on the accident study: the Clear Zone (CZ), Accident Potential Zone I (APZ I) and Accident Potential II (APZ II). The clear zone starts at the end of the runway and extends outward 3,000 feet. It has the highest incident of accidents of the three zones. The Air Force adopted a policy of acquiring property rights to areas designated as clear zones due to the high accident potential. APZ I extends from the clear zone an additional 5,000 feet and APZ II extends from APZ I an additional 7,000 feet. Each area has a lesser accident potential.

**A3.1.2.** The risk of people due to aircraft accidents is small, however, an accident is a high consequence event and the result is often catastrophic. Despite stringent maintenance requirements and countless hours of training, past history makes it clear that accidents are going to occur. The Air Force does not attempt to base its land use recommendations on accident probabilities, but by the fact that an aircraft accident is a significant catastrophic event and poses a higher risk of injury and damage.

**A3.2. Analysis.** The potential for aircraft accidents differ between military and commercial/general aviation accidents because of the variety of aircraft used, the type of missions, and the number of training flights. In 1973, the Air Force conducted a aircraft accident hazard study in order to identify land near airfields with high risk of accident potential. The study found that 61% of the accidents were related to landing operations and 30% were takeoff related. It also found that 70% occurred in daylight and that fighter and training aircraft accounted for 80% of the accidents.

**A3.2.1.** The purpose of the study was to define the accident hazards. The data was plotted in relation to the airfield and it showed that the accidents were clustered along the runway and its extended centerline. Tables were developed to identify the frequency of accidents as a function of distance. Tables A3.1 and A3.2 show the percent of accidents and the cumulative percent of accidents, based on the 1973 accident study.

**A3.2.2.** Table A3.2 identifies an optimum width of the runway extensions, which would include the maximum percentage of accidents in the smallest area, which is the 3,000' width. The data in table A3.2 is then plotted as a distribution of cumulative percentage of accidents versus the distance of the accident from the runway. Figure A3.1, Distribution of Air Force Accidents (1968 - 1972), shows that the percentage of accidents rises rapidly from the end of the runway to 3,000 feet, rises gradually to 8,000 feet, continues at about the same increase to 15,000 feet where it almost levels off.

**Table A3.1. Percent of Accidents.**

| **Length From End of Runway** | **Width of Extensions*** | | |
|---|---|---|---|
| | 2,000' | 3,000' | 4,000' |
| | | | |
| On or adjacent to runway | 23 | 23 | 23 |
| 0 to 3,000' | 35 | 39 | 39 |
| 3,000' to 8,000' | 8 | 8 | 8 |
| 8,000' to 15,000' | 5 | 5 | 7 |

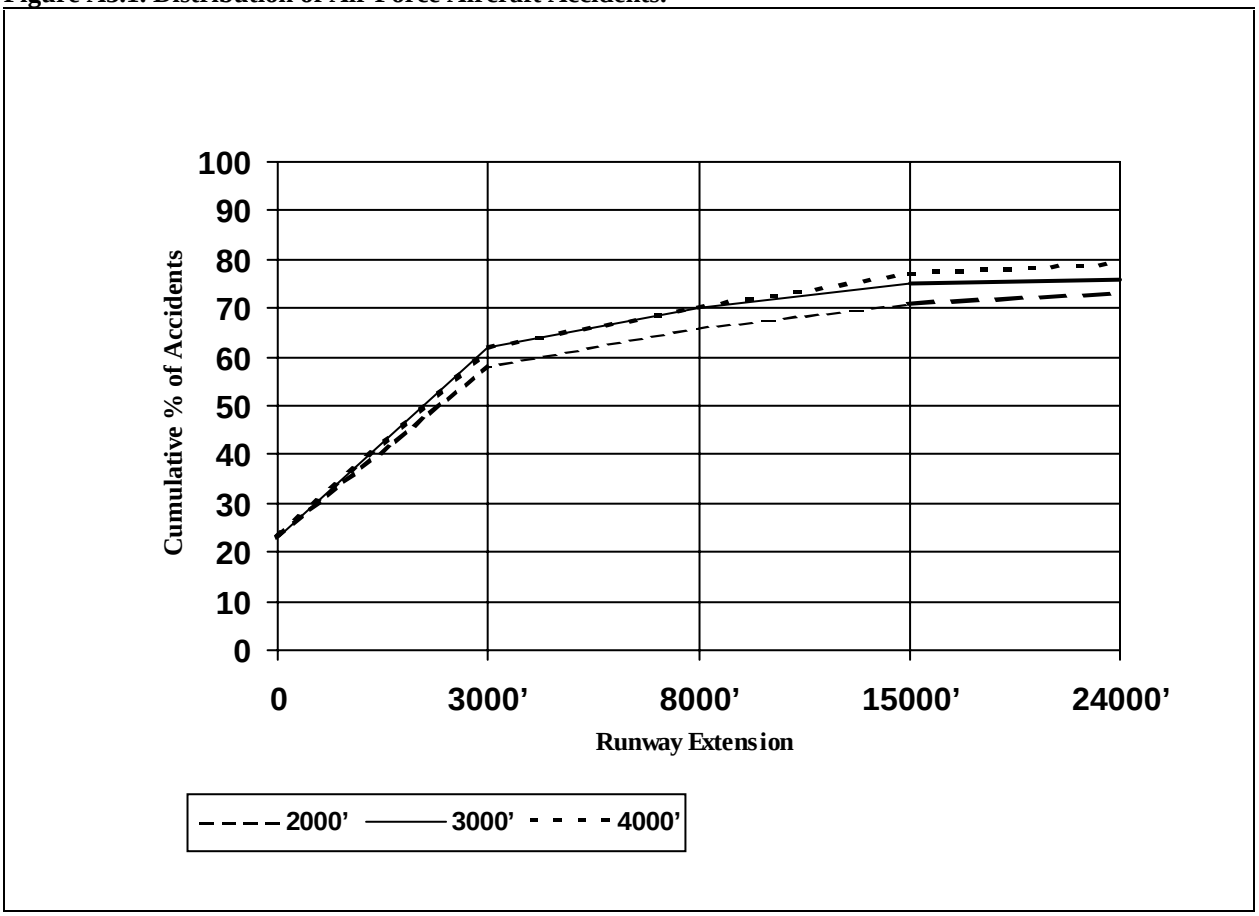
*** Note: The runway centerline is the midpoint for the widths.**

**Table A3.2. Cumulative Percentage of Accidents.**

| **Length From End of Runway** | **Width of Extensions*** | | |
|---|---|---|---|
| | 2,000' | 3,000' | 4,000' |
| | | | |
| On or adjacent to runway | 23 | 23 | 23 |
| 0 to 3,000' | 58 | 62 | 62 |
| 3,000' to 8,000' | 66 | 70 | 70 |
| 8,000' to 15,000' | 70 | 75 | 77 |

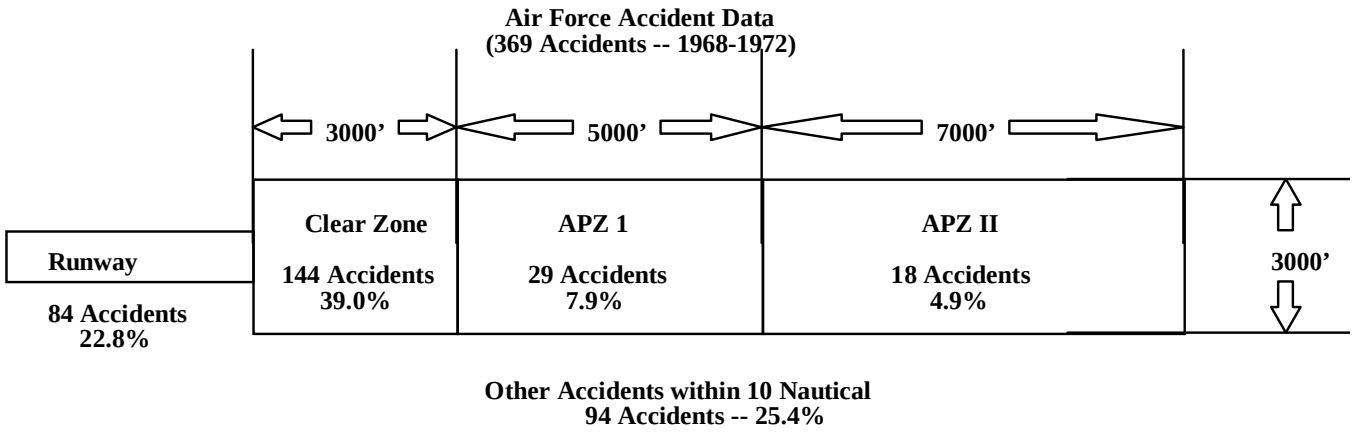
*** Note: The runway centerline is the midpoint for the widths.**

**Figure A3.1. Distribution of Air Force Aircraft Accidents.**



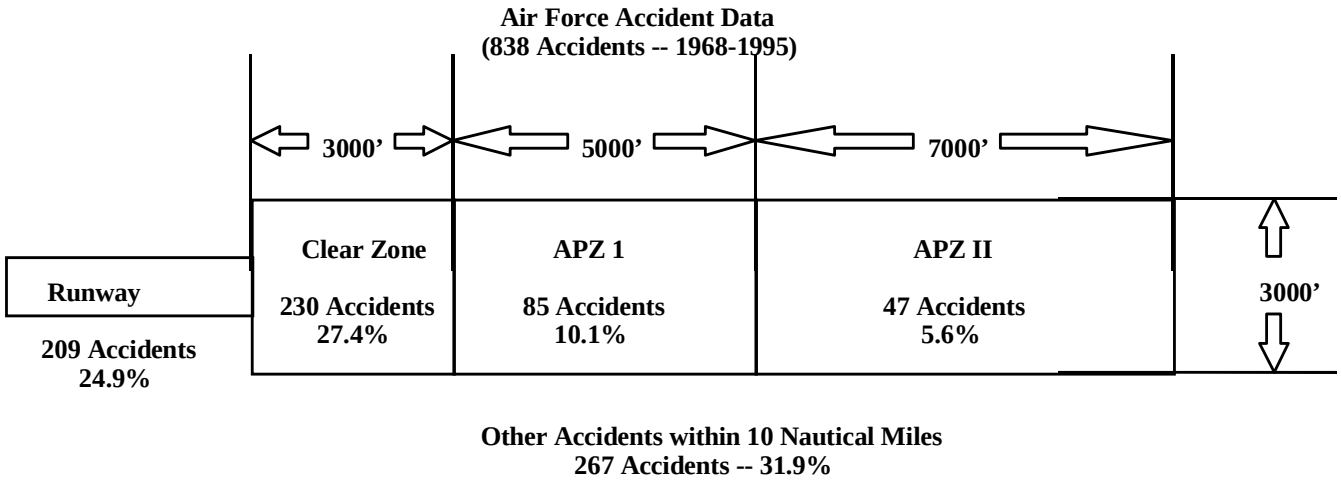

**A3.2.3.** Using the optimum runway extension width, 3,000 feet, and the cumulative distribution of accidents from the end of the runway, zones were established which correlated minimum land area with maximum percentage of accidents. The zone dimensions and accident statistics for the initial study are shown in figure A3.2.

**Figure A3.2. Air Force Accident Data (1968-1972).**




**A3.2.4.** The original study data has continually been updated, and includes 838 accidents during the 1968 thru September 1995 period. The accident statistics of the updated study are shown in figure A3.3.

**Figure A3.3. Air Force Accident Data (1968-1995).**




**A3.2.5.** Using the designated zones and the accident data, a ratio of percentage of accidents to percentage of area size can be calculated. The ratios in Table A3.3 show that the clear zone, with the smallest area size and the highest number of accidents, has the highest ratio, followed by the runway and adjacent area, APZ I and then APZ II.

**Table A3.3. Ratio of Percentage of Accidents to Percentage of Area (Air Force Accident Data -- 1968-1995).**

| | **Area (Acres)**<br><br>**See Note 1** | **Number of Accidents**<br><br>**See Note 2** | **Accidents per Acre** | **Percent of Total Area** | **Percent of Total Accidents** | **Ratio: % Accidents to % Area**<br>**See Note 3** |
|---|---|---|---|---|---|---|
| **Runway and Adjacent Area**<br>**See Note 4** | 487 | 209 | 1 per<br>2.3 acres | 0.183 | 24.9 | 136 |
| **Clear Zone** | 413 | 230 | 1 per<br>1.8 acres | 0.155 | 27.4 | 177 |
| **APZ I** | 689 | 85 | 1 per<br>8.1 acres | 0.258 | 10.1 | 39 |
| **APZ II** | 964 | 47 | 1 per<br>20.5 acres | 0.362 | 5.6 | 15 |
| **Other Area** | 264,053 | 267 | 1 per<br>989 acres | 99.042 | 31.9 | 0.3 |

**Notes:**

1. Area includes land within ten nautical miles of runway (266,606 acres).
2. Total number of accidents is 838.
3. Percent total accidents divided by percent total area.
4. Runway and Adjacent Area dimensions are 2000’ by 10,600’.

**Attachment 4**

**LAND USE COMPATIBILITY**

**Table A4.1. Land Use Compatibility With Respect To Noise And Accident Potential.**

| LAND USE | | ACCIDENT POTENTIAL ZONES | | | NOISE ZONES | | | |
|---|---|---|---|---|---|---|---|---|
| SLUCM NO. | NAME | CLEAR ZONE | APZ I | APZ II | 65-69 dB | 70-74 dB | 75-79 dB | 80+ dB |
| 10 | Residential | | | | | | | |
| 11 | Household units | | | | | | | |
| 11.11 | Single units; detached | N | N | Y[1] | A[11] | B[11] | N | N |
| 11.12 | Single units; semidetached | N | N | N | A[11] | B[11] | N | N |
| 11.13 | Single units; attached row | N | N | N | A[11] | B[11] | N | N |
| 11.21 | Two units; side-by-side | N | N | N | A[11] | B[11] | N | N |
| 11.22 | Two units; one above the other | N | N | N | A[11] | B[11] | N | N |
| 11.31 | Apartments; walk up | N | N | N | A[11] | B[11] | N | N |
| 11.32 | Apartments; elevator | N | N | N | A[11] | B[11] | N | N |
| 12 | Group quarters | N | N | N | A[11] | B[11] | N | N |
| 13 | Residential hotels | N | N | N | A[11] | B[11] | N | N |
| 14 | Mobile home parks or courts | N | N | N | N | N | N | N |
| 15 | Transient lodgings | N | N | N | A[11] | B[11] | C[11] | N |
| 16 | Other residential | N | N | N[1] | A[11] | B[11] | N | N |
| 20 | Manufacturing | | | | | | | |
| 21 | Food & kindred products; manufacturing | N | N[2] | Y | Y | Y[12] | Y[13] | Y[14] |
| 22 | Textile mill products; manufacturing | N | N[2] | Y | Y | Y[12] | Y[13] | Y[14] |
| 23 | Apparel and other finished products made from fabrics, leather, and similar materials; manufacturing | N | N | N[2] | Y | Y[12] | Y[13] | Y[14] |
| 24 | Lumber and wood products (except furniture); manufacturing | N | Y[2] | Y | Y | Y[12] | Y[13] | Y[14] |
| 25 | Furniture and fixtures; manufacturing | N | Y[2] | Y | Y | Y[12] | Y[13] | Y[14] |
| 26 | Paper & allied products; manufacturing | N | Y[2] | Y | Y | Y[12] | Y[13] | Y[14] |
| 27 | Printing, publishing, and allied industries | N | Y[2] | Y | Y | Y[12] | Y[13] | Y[14] |
| 28 | Chemicals and allied products; manufacturing | N | N | N[2] | Y | Y[12] | Y[13] | Y[14] |
| 29 | Petroleum refining and related industries | N | N | N | Y | Y[12] | Y[13] | Y[14] |
| 30 | Manufacturing | | | | | | | |
| 31 | Rubber and misc. plastic products, manufacturing | N | N[2] | N[2] | Y | Y[12] | Y[13] | Y[14] |
| 32 | Stone, clay and glass products manufacturing | N | N[2] | Y | Y | Y[12] | Y[13] | Y[14] |
| 33 | Primary metal industries | N | N[2] | Y | Y | Y[12] | Y[13] | Y[14] |
| 34 | Fabricated metal products;manufacturing | N | N[2] | Y | Y | Y[12] | Y[13] | Y[14] |

| LAND USE | | ACCIDENT POTENTIAL ZONES | | | NOISE ZONES | | | |
|---|---|---|---|---|---|---|---|---|
| SLUCM NO. | NAME | CLEAR ZONE | APZ I | APZ II | 65-69 dB | 70-74 dB | 75-79 dB | 80+ dB |
| 35 | Professional, scientific, and controlling instruments; photographic and optical goods; watches and clocks manufacturing | N | N | N[2] | Y | A | B | N |
| 39 | Miscellaneous manufacturing | N | Y[2] | Y[2] | Y | Y[12] | Y[13] | Y[14] |
| 40 | Transportation, communications and utilities | | | | | | | |
| 41 | Railroad, rapid rail transit and street railroad transportation | N[3] | Y[4] | Y | Y | Y[12] | Y[13] | Y[14] |
| 42 | Motor vehicle transportation | N[3] | Y | Y | Y | Y[12] | Y[13] | Y[14] |
| 43 | Aircraft transportation | N[3] | Y[4] | Y | Y | Y[12] | Y[13] | Y[14] |
| 44 | Marine craft transportation | N[3] | Y[4] | Y | Y | Y[12] | Y[13] | Y[14] |
| 45 | Highway & street right-of-way | N[3] | Y | Y | Y | Y[12] | Y[13] | Y[14] |
| 46 | Automobile parking | N[3] | Y[4] | Y | Y | Y[12] | Y[13] | Y[14] |
| 47 | Communications | N[3] | Y[4] | Y | Y | A[15] | B[15] | N |
| 48 | Utilities | N[3] | Y[4] | Y | Y | Y | Y[12] | Y[13] |
| 49 | Other transportation communications and utilities | N[3] | Y[4] | Y | Y | A[15] | B[15] | N |
| 50 | Trade | | | | | | | |
| 51 | Wholesale trade | N | Y[2] | Y | Y | Y[12] | Y[13] | Y[14] |
| 52 | Retail trade-building materials, hardware and farm equipment | N | Y[2] | Y | Y | Y[12] | Y[13] | Y[14] |
| 53 | Retail trade-general merchandise | N | N[2] | Y[2] | Y | A | B | N |
| 54 | Retail trade-food | N | N[2] | Y[2] | Y | A | B | N |
| 55 | Retail trade-automotive, marine craft, aircraft and accessories | N | Y[2] | Y[2] | Y | A | B | N |
| 56 | Retail trade-apparel and accessories | N | N[2] | Y[2] | Y | A | B | N |
| 57 | Retail trade-furniture, home furnishings and equipment | N | N[2] | Y[2] | Y | A | B | N |
| 58 | Retail trade-eating and drinking establishments | N | N | N[2] | Y | A | B | N |
| 59 | Other retail trade | N | N[2] | Y[2] | Y | A | B | N |
| 60 | Services | | | | | | | |
| 61 | Finance, insurance and real estate services | N | N | Y[6] | Y | A | B | N |
| 62 | Personal services | N | N | Y[6] | Y | A | B | N |
| 62.4 | Cemeteries | N | Y[7] | Y[7] | Y | Y[12] | Y[13] | Y[14,21] |
| 63 | Business services | N | Y[8] | Y[8] | Y | A | B | N |
| 64 | Repair services | N | Y[2] | Y | Y | Y[12] | Y[13] | Y[14] |
| 65 | Professional services | N | N | Y[6] | Y | A | B | N |

| LAND USE | | ACCIDENT POTENTIAL ZONES | | | NOISE ZONES | | | |
|---|---|---|---|---|---|---|---|---|
| **SLUCM NO.** | **NAME** | **CLEAR ZONE** | **APZ I** | **APZ II** | **65-69 dB** | **70-74 dB** | **75-79 dB** | **80+ dB** |
| 65.1 | Hospitals, nursing homes | N | N | N | A* | B* | N | N |
| 65.1 | Other medical facilities | N | N | N | Y | A | B | N |
| 66 | Contract construction services | N | Y[6] | Y | Y | A | B | N |
| 67 | Governmental services | N | N | Y[6] | Y* | A* | B* | N |
| 68 | Educational services | N | N | N | A* | B* | N | N |
| 69 | Miscellaneous services | N | N[2] | Y[2] | Y | A | B | N |
| 70 | Cultural, entertainment and recreational | | | | | | | |
| 71 | Cultural activities (including churches) | N | N | N[2] | A* | B* | N | N |
| 71.2 | Nature exhibits | N | Y[2] | Y | Y* | N | N | N |
| 72 | Public assembly | N | N | N | Y | N | N | N |
| 72.1 | Auditoriums, concert halls | N | N | N | A | B | N | N |
| 72.11 | Outdoor music shell, amphitheaters | N | N | N | N | N | N | N |
| 72.2 | Outdoor sports arenas, spectator sports | N | N | N | Y[17] | Y[17] | N | N |
| 73 | Amusements | N | N | Y[8] | Y | Y | N | N |
| 74 | Recreational activities (including golf courses, riding stables, water recreation) | N | Y[8,9, 10] | Y | Y* | A* | B* | N |
| 75 | Resorts and group camps | N | N | N | Y* | Y* | N | N |
| 76 | Parks | N | Y[8] | Y[8] | Y* | Y* | N | N |
| 79 | Other cultural, entertainment and recreation | N | Y[9] | Y[9] | Y* | Y* | N | N |
| 80 | Resources production and extraction | | | | | | | |
| 81 | Agriculture (except livestock) | Y[16] | Y | Y | Y[18] | Y[19] | Y[20] | Y[20,21] |
| 81.5 to 81.7 | Livestock farming and animal breeding | N | Y | Y | Y[18] | Y[19] | Y[20] | Y[20,21] |
| 82 | Agricultural related activities | N | Y[5] | Y | Y[18] | Y[19] | N | N |
| 83 | Forestry activities and related services | N[5] | Y | Y | Y[18] | Y[19] | Y[20] | Y[20,21] |
| 84 | Fishing activities and related services | N[5] | Y[5] | Y | Y | Y | Y | Y |
| 85 | Mining activities and related services | N | Y[5] | Y | Y | Y | Y | Y |
| 89 | Other resources production and extraction | N | Y[5] | Y | Y | Y | Y | Y |

**LEGEND**

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

**Y** - (Yes) - Land use and related structures are compatible without restriction.

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

**Y[X]** - (yes with restrictions) - Land use and related structures generally compatible; see notes indicated by the superscript.

**N[X]** - (no with exceptions) - See notes indicated by the superscript.

**NLR** - (Noise Level Reduction) - NLR (outdoor to indoor) to be achieved through incorporation of noise attenuation measures into the design and construction of the structures.

**A, B, or C** - Land use and related structures generally compatible; measures to achieve NLR for A(DNL/CNEL 65-69), B(DNL/CNEL 70-74), C(DNL/CNEL 75-79), need to be incorporated into the design and construction of structures.

**A*, B*, and C*** - Land use generally compatible with NLR. However, measures to achieve an overall noise level reduction do not necessarily solve noise difficulties and additional evaluation is warranted. See appropriate footnotes.

***** - The designation of these uses as "compatible" in this zone reflects individual federal agencies' and program considerations of general cost and feasibility factors, as well as past community experiences and program objectives. Localities, when evaluating the application of these guidelines to specific situations, may have different concerns or goals to consider.

**NOTES:**

1. Suggested maximum density of 1-2 dwelling units per acre, possibly increased under a Planned Unit Development (PUD) where maximum lot coverage is less than 20 percent.
2. Within each land use category, uses exist where further deliberating by local authorities may be needed due to the variation of densities in people and structures. Shopping malls and shopping centers are considered incompatible use in any accident potential zone (CZ, APZ I, or APZ II).
3. The placing of structures, buildings, or above-ground utility lines in the clear zone is subject to severe restrictions. In a majority of the clear zones, these items are prohibited. See AFI 32-7060 (formerly AFR 19-9) and AFJM 32-8008 (formerly AFM 86-14) for specific guidance.
4. No passenger terminals and no major above-ground transmission lines in APZ I.
5. Factors to be considered: labor intensity, structural coverage, explosive characteristics, and air pollution.
6. Low-intensity office uses only. Meeting places, auditoriums, etc., are not recommended.
7. Excludes chapels.
8. Facilities must be low intensity.
9. Clubhouse not recommended.
10. Areas for gatherings of people are not recommended.
11.

A. Although local conditions may require residential use, it is discouraged in DNL/CNEL 65-69 dB and strongly discouraged in DNL/CNEL 70-74 dB. The absence of viable alternative development options should be determined and an evaluation indicating a demonstrated community need for residential use would not be met if development were prohibited in these zones should be conducted prior to approvals.

B. Where the community determines the residential uses must be allowed, measures to achieve outdoor to indoor Noise Level Reduction (NLR) for DNL/CNEL 65-69 dB and DNL/CNEL 70-74 dB should be incorporated into building codes and considered in individual approvals

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

12. Measures to achieve the same NLR as required for facilities in DNL/CNEL 65-69 dB range 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.
13. Measures to achieve the same NLR as required for facilities in DNL/CNEL 70-74 dB range 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.
14. Measures to achieve the same NLR as required for facilities in DNL/CNEL 75-79 dB range 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.
15. If noise sensitive, use indicated NLR; if not, the use is compatible.
16. No buildings.
17. Land use is compatible provided special sound reinforcement systems are installed.
18. Residential buildings require the same NLR as required for facilities in DNL/CNEL 65-69 dB range.
19. Residential buildings require the same NLR as required for facilities in DNL/CNEL 70-74 dB range.
20. Residential buildings are not permitted.
21. Land use is not recommended. If the community decides the use is necessary, hearing protection devices should be worn by personnel.

**Attachment 5**

**AICUZ STUDY**

**A5.1. The AICUZ Report.** The following section is a generic AICUZ report. Generic Volumes I, II, III and Citizen Brochure are included for installations use in developing their AICUZ report. The AICUZ report will be provided to the local communities for their use in their planning around the installation.

MEMORANDUM FOR: Area Governments

FROM: **[Organization]**
**[Address]**

SUBJECT: Air Installation Compatible Use Zone (AICUZ) Study

1. This Air Installation Compatible Use Zone (AICUZ) Study for **[NAME]** Air Force Base is an update of the original AICUZ study dated **[Date]** and updated **[Date]**. The update was initiated because of **[provide reason for the study such as flight track changes, operational changes, and mission changes]**. It is a reevaluation of aircraft noise and accident potential related to Air Force flying operations. It is designed to aid in the development of local planning mechanisms which will protect the public safety and health, as well as preserve the operational capabilities of **[NAME]** AFB.

2. The enclosed report contains a summary description of the affected area around the base. The report outlines the location of runway clear zones, aircraft accident potential zones and noise contours, and recommends compatible land use for areas in the vicinity of the base. It is our hope that this information will be incorporated into your community plans, zoning ordinances, subdivision regulations, building codes, and other related documents.

3. The basic objective of the AICUZ program is to achieve compatible uses of public and private lands in the vicinity of military airfields by controlling incompatible development through local actions. This update provides noise contours based upon the Day-Night Average A-Weighted Sound Level (DNL) metric used by the Air Force. This report provides the information necessary to maximize beneficial use of the land surrounding **[NAME]** Air Force Base while minimizing the potential for degradation of the health and safety of the affected public.

4. We greatly value the positive relationship **[NAME]** AFB has experienced with its neighbors over the years. As a partner in the process, we have attempted to minimize noise disturbances through such actions as: minimizing night flying, avoiding flights over heavily populated areas, installing jet engine noise suppressers for maintenance activities, etc. We solicit your cooperation in implementing the recommendations and guidelines presented in this AICUZ report.

**[Commander's Signature Block]**

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## SECTION 1 PURPOSE AND NEED

### 1.1 Introduction

This study is an update of the **[NAME]** Air Force Base Air Installation Compatible Use Zone (AICUZ) Study. The update presents and documents the changes to the AICUZ for the period of **[YEAR of last AICUZ]** to **[YEAR]**. It reaffirms Air Force policy of promoting public health, safety, and general welfare in areas surrounding **[BASE]** AFB. The report presents changes in flight operations since the last study, and provides current noise contours and compatible use guidelines for land areas surrounding the base. It is hoped this information will assist the local communities, and serve as a tool for future planning and zoning activities. The changes in the AICUZ are attributed to:

**[List reason and changes from last AICUZ]**

### 1.2 Purpose and Need

As stated in the previous **[NAME]** AFB AICUZ Study, the purpose of the AICUZ program is to promote compatible land development in areas subject to aircraft noise and accident potential. As the cities of **[List the cities]**, towns of **[List the towns]**, and counties of **[List the counties]** prepare and modify their land use development plans, recommendations from this updated AICUZ study should be included in their planning process to prevent incompatibility that may compromise **[NAME]** AFB ability to fulfill its mission requirements. Accident potential and aircraft noise should be major considerations in their planning processes.

Air Force AICUZ land use guidelines reflect land use recommendations for clear zones, accident potential zones I and II, and four noise zones. These guidelines have been established on the basis of studies prepared and sponsored by several federal agencies, including the Department of Housing and Urban Development, Environmental Protection Agency, Air Force, and state and local agencies. The guidelines recommend land uses which are compatible with airfield operations while allowing maximum beneficial use of adjacent properties. The Air Force has no desire to recommend land use regulations which render property economically useless. It does, however, have an obligation to the inhabitants of the **[NAME]** AFB environs and to the citizens of the United States to point out ways to protect the people in adjacent areas, as well as the public investment in the installation itself.

The AICUZ program uses the latest technology to define noise levels in areas near Air Force installations. An analysis of **[NAME]** AFB's flying operations was performed, including types of aircraft, flight patterns utilized, variations in altitude, power settings, number of operations, and hours of operations. This information was used to develop the noise contours contained in this study. The Department of Defense (DoD) NOISEMAP methodology and the Day-Night Average A-Weighted Sound Level (DNL) metric was used to define the noise zones for **[NAME]** AFB.

### 1.3 Process and Procedure

Preparation and presentation of this update to **[NAME]** AFB's AICUZ Study is part of the continuing Air Force participation in the local planning process. It is recognized that, as local communities prepare land use plans and zoning ordinances, the Air Force has the responsibility of providing inputs on its activities relating to the community. This study is presented in the spirit of mutual cooperation and assistance by **[NAME]** AFB to aid in the local land use planning process. This study updates information on base flying activities since **[Year of last AICUZ]**. Noise contours portrayed on the AICUZ maps in this study are based on current mission plans.

**[NAME] AFB, [STATE]**

Data collection was conducted at **[NAME]** AFB in **[Month and Year]**. Aircraft operational and maintenance data was obtained to derive average daily operations by runway and type of aircraft. This data was supplemented by flight track information (where we fly), flight profile information (how we fly), and ground run-up information. After verification for accuracy, data was input into the NOISEMAP program to produce day-night average noise level (DNL) contours. Contours were plotted on an area map and overlaid with clear zone and accident potential zone areas. Appendix A of Volume II contains detailed information on the development of the AICUZ program.

## SECTION 2 INSTALLATION DESCRIPTION

### 2.1 Mission

**[Describe the mission and organizations that are assigned to the base. Give information on the squadrons, aircraft in each of the units, and their function.]**

### 2.2 Economic Impact

**[Describe location and economical impact on each city, county, and town within the region. Identify the number of personnel assigned to the base for each organization. Identify the amount of construction contracts and service, equipment, and supply contracts. Give a description of how the base impacts the community economically.]**

**Table 2-1. PERSONNEL BY CLASSIFICATION AND HOUSING - FY [YEAR]**

| CLASSIFICATION | LIVING ON-BASE | LIVING OFF-BASE | TOTAL |
|---|---|---|---|
| **ACTIVE DUTY MILITARY** | | | |
| **TRADITIONAL GUARDSMEN/RESERVE** | | | |
| **TOTAL MILITARY** | | | |
| **MILITARY RETIREES** | | | |
| **APPROPRIATED FUND CIVILIAN** | | | |
| General Schedule | | | |
| Federal Wage Board | | | |
| Other | | | |
| **NON-APPROPRIATED FUND, CONTRACT CIVILIANS, AND PRIVATE BUSINESS** | | | |
| Civilian NAF | | | |
| Civilian BX | | | |
| Contract Civilians | | | |
| Private Businesses On-base | | | |
| **GRAND TOTAL** | | | |

Each base should customize a table to fit their needs. This table is meant to be an example.

Source: **[NAME]** AFB Economic Resource Impact Statement, Fiscal Year **[YEAR]** .

**Table 2-2 SUMMARY OF ANNUAL GROSS PAYROLL - FY [YEAR]**

| CLASSIFICATION | LIVING ON-BASE | LIVING OFF-BASE | TOTAL |
|---|---|---|---|
| **ACTIVE DUTY MILITARY** | $ | $ | $ |
| **APPROPRIATED FUND CIVILIAN** | | | |
| General Schedule | | | $ |
| Federal Wage Board | | | $ |
| **NONAPPROPRIATED FUND CIVILIAN, CONTRACT CIVILIAN AND PRIVATE BUSINESS** | | | |
| Civilian NAF | | | $ |
| Civilian BX | | | $ |
| Private Business | | | $ |
| **MILITARY RETIREES (ALL BRANCHES)** | | | $ |
| **TOTAL PAYROLL** | | | **$** |

Each base should customize a table to fit their needs. This table is meant to be an example.

Source: **[NAME]** AFB Economic Resource Impact Statement, Fiscal Year **[YEAR]**.

**Table 2-3 SUMMARY OF CONSTRUCTION, CONTRACTS AND EXPENDITURES FOR MATERIALS, EQUIPMENT, AND SUPPLIES - FY [YEAR]**

| VARIABLE | ACTUAL ANNUAL EXPENDITURE |
|---|---|
| **CONSTRUCTION** | $ |
| **CONTRACTS & PROCUREMENT: SERVICES, MATERIALS, EQUIPMENT, AND SUPPLIES** | |
| Total Services | $ |
| Commissary & Base Exchange | $ |
| Health (CHAMPUS, Government Cost Only) | $ |
| Education (Impact Aid and Tuition Assistance) | $ |
| Temporary Duty Payments | $ |
| Other Materials, Equipment and Supplies Procurement | $ |
| **TOTAL ACTUAL ANNUAL EXPENDITURES** | **$** |

Each base should customize a table to fit their needs. This table is meant to be an example.

Source: **[NAME]** AFB Economic Resource Impact Statement, Fiscal Year **[YEAR]**.

**Figure 1 VICINITY MAP**
**[Show Map Here]**

**2.3 Flying Activity**

To describe the relationship between aircraft operations and land use, it is necessary to fully evaluate the exact nature of flying activities. An inventory has been made of such things as the types of aircraft based at **[NAME]** AFB, where those aircraft fly, how high they fly, how many times they fly over a given area, and at what time of day they operate.

Current aircraft activity at **[NAME] AFB** is summarized below.

| TYPE OF AIRCRAFT | AVERAGE DAILY OPERATIONS |
|---|---|
| **[Aircraft]** | **[Number of Daily Operations]** |

In addition to these assigned aircraft, numerous transient aircraft from other military installations land and take-off from **[NAME]** AFB.

**[NAME]** AFB aircraft use the following basic flight patterns:

Straight out departure.

Straight in approach.

Overhead landing pattern.

Instrument flight rules (IFR) or radar closed pattern.

Visual flight rules (VFR) or closed pattern.

Re-entry VFR pattern.

**[NAME]** AFB flight patterns (Figure 2) result from several considerations, including:

Takeoff patterns routed to avoid heavily populated areas as much as possible.

Air Force criteria governing the speed, rate of climb, and turning radius for each type of aircraft.

Efforts to control and schedule missions to keep noise levels low, especially at night.

Coordination with the Federal Aviation Administration (FAA) to minimize conflict with civilian aircraft operations.

To the maximum extent possible, engine run-up locations have been established in areas that minimize noise for people on-base, as well as for those in the surrounding communities. Normal base operations do not include late night engine runups, but heavy work loads or unforeseen contingencies sometimes require a limited number of nighttime engine runups.

Airfield environs planning is concerned with three primary aircraft operational/land use determinants: (1) accident potential to land users, (2) aircraft noise, and (3) hazards to operations from land uses (height obstructions, etc.). Each of these concerns is addressed in conjunction with mission requirements and safe aircraft operation to determine the optimum flight track for each aircraft type. The flight tracks depicted in Figure 2 are the result of such planning.

**Figure 2 FLIGHT TRACKS**
**[Show Map Here]**

## SECTION 3 LAND USE COMPATIBILITY GUIDELINES

### 3.1 Introduction

The Department of Defense (DoD) developed the Air Installation Compatible Use Zone (AICUZ) program for military airfields. Using this program, DoD works to protect aircraft operational capabilities at its installations and to assist local government officials in protecting and promoting the public health, safety, and quality of life. The goal is to promote compatible land use development around military airfields by providing information on aircraft noise exposure and accident potential.

AICUZ reports describe three basic types of constraints that affect, or result, from flight operations. The first constraint involves areas which the Federal Aviation Administration (FAA) and DoD have identified for height limitations (see Height and Obstruction Criteria in Appendix D of Volume II). Air Force obstruction criteria are based upon those contained in Federal Aviation Regulation Part 77, Subpart C.

The second constraint involves noise zones produced by the computerized Day-Night Average A-Weighted Sound Level (DNL) metric and the DoD NOISEMAP methodology. Using the NOISEMAP program, which is similar to FAA's Integrated Noise Model, DoD produces noise contours showing the noise levels generated by current aircraft operations. The AICUZ report contains noise contours plotted in increments of 5 dB, ranging from DNL 65 dB to 80+ dB. Figure 3 shows current DNL noise contours based on current operations. Additional information on noise methodology is contained in Appendix C of Volume II of this report.

The third constraint involves accident potential zones based on statistical analysis of past DoD aircraft accidents. DoD analysis has determined that the areas immediately beyond the ends of runways and along the approach and departure flight paths have significant potential for aircraft accidents. Based on this analysis, DoD developed three zones that have high relative potential for accidents. The clear zone, the area closest to the runway end, is the most hazardous. The overall risk is so high that DoD generally acquires the land through purchase or easement to prevent development. Accident potential zone I (APZ I) is an area beyond the clear zone that possesses a significant potential for accidents. Accident potential zone II (APZ II) is an area beyond APZ I having lesser, but still significant potential for accidents. While aircraft accident potential in APZs I and II does not warrant acquisition by the Air Force, land use planning and controls are strongly encouraged in these areas for the protection of the public. **[NAME]** AFB clear zones encompass areas 3,000 feet wide by 3,000 feet long. APZ I is 3,000 feet wide by 5,000 feet long, and APZ II is 3,000 feet wide by 7,000 feet long (Figure 3). Clear zones and accident potential zones are established for each runway. These zones overlap at **[NAME]** AFB as a result of the two parallel runways. Additional information on accident potential is contained in Appendix B of Volume II of this report.

**Figure 3 NOISE ZONES AND ACCIDENT POTENTIAL ZONES**
**[Show Map Here]**

### 3.2 Land Use Compatibility

Each AICUZ report contains land use guidelines. Figure 4 lists land uses versus all possible combinations of noise exposure and accident potential at **[NAME]** AFB, showing land uses that are compatible or incompatible. Noise guidelines are essentially the same as those published by the Federal Interagency Committee on Urban Noise in the June 1980 publication, *Guidelines for Considering Noise in Land Use Planning and Control*. The U.S. Department of Transportation publication, *Standard Land Use Coding Manual (SLUCM)*, has been used for identifying and coding land use activities.

### 3.3 Participation In The Planning Process

As local communities prepare their land use plans, the Air Force must be ready to provide additional inputs. The Base Civil Engineer has been designated as the official liaison with the local community on all planning matters. This office is prepared to participate in the continuing discussion of zoning and other land use matters as they may affect, or may be affected by, **[NAME]** AFB.

**[NAME] AFB, [STATE]**

**Figure 4**
**LAND USE COMPATIBILITY**

| LAND USE | | ACCIDENT POTENTIAL ZONES | | | NOISE ZONES | | | |
|---|---|---|---|---|---|---|---|---|
| SLUCM NO. | NAME | CLEAR ZONE | APZ I | APZ II | 65-69 dB | 70-74 dB | 75-79 dB | 80+ dB |
| 10 | Residential | | | | | | | |
| 11 | Household units | | | | | | | |
| 11.11 | Single units; detached | N | N | Y[1] | A[11] | B[11] | N | N |
| 11.12 | Single units; semidetached | N | N | N | A[11] | B[11] | N | N |
| 11.13 | Single units; attached row | N | N | N | A[11] | B[11] | N | N |
| 11.21 | Two units; side-by-side | N | N | N | A[11] | B[11] | N | N |
| 11.22 | Two units; one above the other | N | N | N | A[11] | B[11] | N | N |
| 11.31 | Apartments; walk up | N | N | N | A[11] | B[11] | N | N |
| 11.32 | Apartments; elevator | N | N | N | A[11] | B[11] | N | N |
| 12 | Group quarters | N | N | N | A[11] | B[11] | N | N |
| 13 | Residential hotels | N | N | N | A[11] | B[11] | N | N |
| 14 | Mobile home parks or courts | N | N | N | N | N | N | N |
| 15 | Transient lodgings | N | N | N | A[11] | B[11] | C[11] | N |
| 16 | Other residential | N | N | N[1] | A[11] | B[11] | N | N |
| 20 | Manufacturing | | | | | | | |
| 21 | Food & kindred products; manufacturing | N | N[2] | Y | Y | Y[12] | Y[13] | Y[14] |
| 22 | Textile mill products; manufacturing | N | N[2] | Y | Y | Y[12] | Y[13] | Y[14] |
| 23 | Apparel and other finished products made from fabrics, leather, and similar materials; manufacturing | N | N | N[2] | Y | Y[12] | Y[13] | Y[14] |
| 24 | Lumber and wood products (except furniture); manufacturing | N | Y[2] | Y | Y | Y[12] | Y[13] | Y[14] |
| 25 | Furniture and fixtures; manufacturing | N | Y[2] | Y | Y | Y[12] | Y[13] | Y[14] |
| 26 | Paper & allied products; manufacturing | N | Y[2] | Y | Y | Y[12] | Y[13] | Y[14] |
| 27 | Printing, publishing, and allied industries | N | Y[2] | Y | Y | Y[12] | Y[13] | Y[14] |
| 28 | Chemicals and allied products; manufacturing | N | N | N[2] | Y | Y[12] | Y[13] | Y[14] |
| 29 | Petroleum refining and related industries | N | N | N | Y | Y[12] | Y[13] | Y[14] |
| 30 | Manufacturing | | | | | | | |
| 31 | Rubber and misc. plastic products, manufacturing | N | N[2] | N[2] | Y | Y[12] | Y[13] | Y[14] |
| 32 | Stone, clay and glass products manufacturing | N | N[2] | Y | Y | Y[12] | Y[13] | Y[14] |
| 33 | Primary metal industries | N | N[2] | Y | Y | Y[12] | Y[13] | Y[14] |
| 34 | Fabricated metal products;manufacturing | N | N[2] | Y | Y | Y[12] | Y[13] | Y[14] |
| 35 | Professional, scientific, and controlling instruments; photographic and optical goods; watches and clocks manufacturing | N | N | N[2] | Y | A | B | N |
| 39 | Miscellaneous manufacturing | N | Y[2] | Y[2] | Y | Y[12] | Y[13] | Y[14] |
| 40 | Transportation, communications and utilities | | | | | | | |
| 41 | Railroad, rapid rail transit and street railroad transportation | N[3] | Y[4] | Y | Y | Y[12] | Y[13] | Y[14] |
| 42 | Motor vehicle transportation | N[3] | Y | Y | Y | Y[12] | Y[13] | Y[14] |
| 43 | Aircraft transportation | N[3] | Y[4] | Y | Y | Y[12] | Y[13] | Y[14] |
| 44 | Marine craft transportation | N[3] | Y[4] | Y | Y | Y[12] | Y[13] | Y[14] |

| LAND USE | | ACCIDENT POTENTIAL ZONES | | | NOISE ZONES | | | |
|---|---|---|---|---|---|---|---|---|
| **SLUCM NO.** | **NAME** | **CLEAR ZONE** | **APZ I** | **APZ II** | **65-69 dB** | **70-74 dB** | **75-79 dB** | **80+ dB** |
| 45 | Highway & street right-of-way | N[3] | Y | Y | Y | Y[12] | Y[13] | Y[14] |
| 46 | Automobile parking | N[3] | Y[4] | Y | Y | Y[12] | Y[13] | Y[14] |
| 47 | Communications | N[3] | Y[4] | Y | Y | A[15] | B[15] | N |
| 48 | Utilities | N[3] | Y[4] | Y | Y | Y | Y[12] | Y[13] |
| 49 | Other transportation communications and utilities | N[3] | Y[4] | Y | Y | A[15] | B[15] | N |
| 50 | Trade | | | | | | | |
| 51 | Wholesale trade | N | Y[2] | Y | Y | Y[12] | Y[13] | Y[14] |
| 52 | Retail trade-building materials, hardware and farm equipment | N | Y[2] | Y | Y | Y[12] | Y[13] | Y[14] |
| 53 | Retail trade-general merchandise | N | N[2] | Y[2] | Y | A | B | N |
| 54 | Retail trade-food | N | N[2] | Y[2] | Y | A | B | N |
| 55 | Retail trade-automotive, marine craft, aircraft and accessories | N | Y[2] | Y[2] | Y | A | B | N |
| 56 | Retail trade-apparel and accessories | N | N[2] | Y[2] | Y | A | B | N |
| 57 | Retail trade-furniture, home furnishings and equipment | N | N[2] | Y[2] | Y | A | B | N |
| 58 | Retail trade-eating and drinking establishments | N | N | N[2] | Y | A | B | N |
| 59 | Other retail trade | N | N[2] | Y[2] | Y | A | B | N |
| 60 | Services | | | | | | | |
| 61 | Finance, insurance and real estate services | N | N | Y[6] | Y | A | B | N |
| 62 | Personal services | N | N | Y[6] | Y | A | B | N |
| 62.4 | Cemeteries | N | Y[7] | Y[7] | Y | Y[12] | Y[13] | Y[14,21] |
| 63 | Business services | N | Y[8] | Y[8] | Y | A | B | N |
| 64 | Repair services | N | Y[2] | Y | Y | Y[12] | Y[13] | Y[14] |
| 65 | Professional services | N | N | Y[6] | Y | A | B | N |
| 65.1 | Hospitals, nursing homes | N | N | N | A* | B* | N | N |
| 65.1 | Other medical facilities | N | N | N | Y | A | B | N |
| 66 | Contract construction services | N | Y[6] | Y | Y | A | B | N |
| 67 | Governmental services | N | N | Y[6] | Y* | A* | B* | N |
| 68 | Educational services | N | N | N | A* | B* | N | N |
| 69 | Miscellaneous services | N | N[2] | Y[2] | Y | A | B | N |
| 70 | Cultural, entertainment and recreational | | | | | | | |
| 71 | Cultural activities (including churches) | N | N | N[2] | A* | B* | N | N |
| 71.2 | Nature exhibits | N | Y[2] | Y | Y* | N | N | N |
| 72 | Public assembly | N | N | N | Y | N | N | N |
| 72.1 | Auditoriums, concert halls | N | N | N | A | B | N | N |
| 72.11 | Outdoor music shell, amphitheaters | N | N | N | N | N | N | N |
| 72.2 | Outdoor sports arenas, spectator sports | N | N | N | Y[17] | Y[17] | N | N |
| 73 | Amusements | N | N | Y[8] | Y | Y | N | N |
| 74 | Recreational activities (including golf courses, riding stables, water recreation) | N | Y[8,9,10] | Y | Y* | A* | B* | N |
| 75 | Resorts and group camps | N | N | N | Y* | Y* | N | N |
| 76 | Parks | N | Y[8] | Y[8] | Y* | Y* | N | N |
| 79 | Other cultural, entertainment and recreation | N | Y[9] | Y[9] | Y* | Y* | N | N |
| 80 | Resources production and extraction | | | | | | | |
| 81 | Agriculture (except livestock) | Y[16] | Y | Y | Y[18] | Y[19] | Y[20] | Y[20,21] |
| 81.5 to 81.7 | Livestock farming and animal breeding | N | Y | Y | Y[18] | Y[19] | Y[20] | Y[20,21] |
| 82 | Agricultural related activities | N | Y[5] | Y | Y[18] | Y[19] | N | N |

| LAND USE | | ACCIDENT POTENTIAL ZONES | | | NOISE ZONES | | | |
|---|---|---|---|---|---|---|---|---|
| **SLUCM NO.** | **NAME** | **CLEAR ZONE** | **APZ I** | **APZ II** | **65-69 dB** | **70-74 dB** | **75-79 dB** | **80+ dB** |
| 83 | Forestry activities and related services | N[5] | Y | Y | Y[18] | Y[19] | Y[20] | Y[20,21] |
| 84 | Fishing activities and related services | N[5] | Y[5] | Y | Y | Y | Y | Y |
| 85 | Mining activities and related services | N | Y[5] | Y | Y | Y | Y | Y |
| 89 | Other resources production and extraction | N | Y[5] | Y | Y | Y | Y | Y |

**LEGEND**

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

**Y** - (Yes) - Land use and related structures are compatible without restriction.

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

**$Y^X$** - (yes with restrictions) - Land use and related structures generally compatible; see notes indicated by the superscript.

**$N^X$** - (no with exceptions) - See notes indicated by the superscript.

**NLR** - (Noise Level Reduction) - NLR (outdoor to indoor) to be achieved through incorporation of noise attenuation measures into the design and construction of the structures.

**A, B, or C** - Land use and related structures generally compatible; measures to achieve NLR for A(DNL/CNEL 65-69), B(DNL/CNEL 70-74), C(DNL/CNEL 75-79), need to be incorporated into the design and construction of structures.

**$A^*$, $B^*$, and $C^*$** - Land use generally compatible with NLR. However, measures to achieve an overall noise level reduction do not necessarily solve noise difficulties and additional evaluation is warranted. See appropriate footnotes.

***** - The designation of these uses as "compatible" in this zone reflects individual federal agencies' and program considerations of general cost and feasibility factors, as well as past community experiences and program objectives. Localities, when evaluating the application of these guidelines to specific situations, may have different concerns or goals to consider.

**[NAME] AFB, [STATE]**

**NOTES**

1. Suggested maximum density of 1-2 dwelling units per acre, possibly increased under a Planned Unit Development (PUD) where maximum lot coverage is less than 20 percent.
2. Within each land use category, uses exist where further deliberating by local authorities may be needed due to the variation of densities in people and structures. Shopping malls and shopping centers are considered incompatible use in any accident potential zone (CZ, APZ I, or APZ II).
3. The placing of structures, buildings, or above-ground utility lines in the clear zone is subject to severe restrictions. In a majority of the clear zones, these items are prohibited. See AFI 32-7060 (formerly AFR 19-9) and AFJM 32-8008 (formerly AFM 86-14) for specific guidance.
4. No passenger terminals and no major above-ground transmission lines in APZ I.
5. Factors to be considered: labor intensity, structural coverage, explosive characteristics, and air pollution.
6. Low-intensity office uses only. Meeting places, auditoriums, etc., are not recommended.
7. Excludes chapels.
8. Facilities must be low intensity.
9. Clubhouse not recommended.
10. Areas for gatherings of people are not recommended.
11.
    A. Although local conditions may require residential use, it is discouraged in DNL/CNEL 65-69 dB and strongly discouraged in DNL/CNEL 70-74 dB. The absence of viable alternative development options should be determined and an evaluation indicating a demonstrated community need for residential use would not be met if development were prohibited in these zones should be conducted prior to approvals.
    B. Where the community determines the residential uses must be allowed, measures to achieve outdoor to indoor Noise Level Reduction (NLR) for DNL/CNEL 65-69 dB and DNL/CNEL 70-74 dB should be incorporated into building codes and considered in individual approvals
    C. NLR criteria will not eliminate outdoor noise problems. However, building location and site planning, and design and use of berms and barriers can help mitigate outdoor exposure, particularly from near ground level sources. Measures that reduce outdoor noise should be used whenever practical in preference to measures which only protect interior spaces.
12. Measures to achieve the same NLR as required for facilities in DNL/CNEL 65-69 dB range 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.
13. Measures to achieve the same NLR as required for facilities in DNL/CNEL 70-74 dB range 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.
14. Measures to achieve the same NLR as required for facilities in DNL/CNEL 75-79 dB range 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.
15. If noise sensitive, use indicated NLR; if not, the use is compatible.
16. No buildings.
17. Land use is compatible provided special sound reinforcement systems are installed.
18. Residential buildings require the same NLR as required for facilities in DNL/CNEL 65-69 dB range.
19. Residential buildings require the same NLR as required for facilities in DNL/CNEL 70-74 dB range.
20. Residential buildings are not permitted.
21. Land use is not recommended. If the community decides the use is necessary, hearing protection devices should be worn by personnel.

## SECTION 4 LAND USE ANALYSIS

### 4.1 Introduction

Land use planning and control is a dynamic, rather than a "static" process. The specific characteristics of land use determinants will always reflect, to some degree, the changing conditions of the economic, social, and physical environment of a community, as well as changing public concern. The planning process accommodates this fluidity in that decisions are normally not based on boundary lines, but rather on more generalized area designations.

**[NAME]** AFB was originally developed in a relatively undeveloped area in **[County]**, **[State]**. In recent years, however, intensive development has increased to the **[directions]** of the base.

Computer technology has enabled **[NAME]** AFB to more precisely display its flight tracks and noise contours for land use planning purposes. This same technology has revealed the extent of **[NAME]** AFB's region of impact extends into the cities of **[cities that are impacted]**.

For the purposes of this study, existing land uses have been classified into one of the following six categories:

Residential: This category includes all types of residential activity, such as single and multi-family residences and mobile homes, at a density greater than one dwelling unit per acre.
Commercial: This category includes offices, retail, restaurants and other types of commercial establishments.
Industrial: This category includes manufacturing, warehousing, and other similar uses.
Public/Quasi-Public: This category includes publicly owned lands and/or lands to which the public has access, including military reservations and training grounds, public buildings, schools, churches, cemeteries, and hospitals.
Recreational: This category includes land areas designated for recreational activity, including parks, wilderness areas and reservations, conservation areas, and areas designated for trails, hikes, camping, etc.
Open/Agriculture/Low Density: This category includes undeveloped land areas, agricultural areas, grazing lands and areas with residential activity at densities less than or equal to one dwelling unit per acre..

### 4.2 Existing Land Use

Existing land uses in the vicinity of **[NAME]** AFB are shown in Figure 5. The compatibility of existing land use in each of the surrounding communities is discussed in detail in the following subsections.

#### 4.2.1 [County]
**[Description of land use]**

#### 4.2.2 [County]
**[Description of land use]**

#### 4.2.3 [CITY]
**[Description of land use]**

**4.2.4 [CITY]**
**[Description of land use]**

**4.3 Current Zoning**

Figure 6 depicts the current zoning in the vicinity of **[NAME]** AFB. The zoning in each of the surrounding communities is discussed in detail in the following subsections.

**4.3.1 [CITY]**
**[Description of zoning]**

**4.3.2 [CITY]**
**[Description of zoning]**

**4.3.3 [COUNTY]**
**[Description of zoning]**

**4.4 Future Land Use**
**[Description of future land use]**

**4.5 Incompatible Land Uses**

**4.5.1 Noise Zones**
**[Description of incompatible land use]**

**4.5.2 Clear Zones and Accident Potential Zones**
**[Description of incompatible land use]**

**4.5.3 Planning Considerations**

AICUZ noise contours describe the noise characteristics of a specific operational environment, and as such, will change if a significant operational change is made. Should a new mission be established at **[NAME]** AFB, adding a larger number of airplanes or additional model types, the AICUZ could be amended.

With these thoughts in mind, **[NAME]** AFB has revised the **[Year of last AICUZ]** AICUZ Study and has provided flight track, accident potential zone, and noise contour information in this report that reflects the most current and accurate picture of aircraft activities.

**[NAME] AFB, [STATE]**

**Figure 5 GENERALIZED EXISTING LAND USE MAP**

**[Show Map Here]**

**Figure 6 GENERALIZED ZONING MAP**

**[Show Map Here]**

**Figure 7 GENERALIZED FUTURE LAND USE MAP**

**[Show Map Here]**

## SECTION 5 IMPLEMENTATION

The implementation of the AICUZ Study must be a joint effort between the Air Force and the adjacent communities. The Air Force's role is to minimize the impact on the local communities by **[NAME]** AFB operations. The role of the communities is to ensure that development in the environs is compatible with accepted planning and development principles and practices.

### 5.1 Air Force Responsibilities

In general, the Air Force perceives its AICUZ responsibilities as encompassing the areas of flying safety, noise abatement, and participation in the land use planning process.

Well maintained aircraft and well trained aircrews do much to assure that aircraft accidents are avoided. Despite the best training of aircrews and maintenance of aircraft, however, history makes it clear that accidents do occur. It is imperative that flights be routed over sparsely populated areas as much as possible to reduce the exposure of lives and property to a potential accident.

By Air Force regulation, commanders are required to periodically review existing traffic patterns, instrument approaches, weather minima, and operating practices, and evaluate these factors in relationship to populated areas and other local situations. This requirement is a direct result and expression of Air Force policy that all AICUZ plans must include an analysis of flying and flying related activities designed to reduce and control the effects of such operations on surrounding land areas. Noise is generated from aircraft both in the air and on the ground. In an effort to reduce the noise effects of **[NAME]** AFB operations on surrounding communities, the base restricts nighttime flying activities and has routed flight tracks to avoid populated areas. Practice takeoffs/landings and instrument approaches are conducted at times when individuals are normally awake. These activities are not scheduled between 10:00 P.M. and 7:00 A.M. During this time, only mission essential aircraft arrivals and departures are conducted. Whenever possible, traffic patterns are all located away from the population centers, both on and off-base. Base maintenance run-up activities are not performed between 10:00 P.M. and 7:00 A.M., except for high priority mission requirements.

The preparation and presentation of this **[NAME]** AFB AICUZ Study is one phase of the continuing Air Force participation in the local planning process. It is recognized that as the local community updates its land use plans, the Air Force must be ready to provide additional inputs.

It is also recognized that the AICUZ program will be an ongoing activity even after compatible development plans are adopted and implemented. Base personnel are prepared to participate in the continuing discussion of zoning and other land use matters as they may affect, or may be affected by **[NAME]** AFB. Base personnel will also be available to provide information, criteria and guidelines to state, regional and local planning bodies, civic associations, and similar groups.

### 5.2 Local Community Responsibilities

Area residents and the personnel at **[NAME]** AFB have a long history of working together for mutual benefit. We feel that adoption of the following recommendations will strengthen this relationship, increase the health and safety of the public, and help protect the integrity of the base's flying mission:

Incorporate AICUZ policies and guidelines into the comprehensive plans of **[List the cities, towns and counties]**. Use overlay maps of the AICUZ noise contours and Air Force Land Use Compatibility Guidelines to evaluate existing and future land use proposals.

Modify existing zoning ordinances and subdivision regulations to support the compatible land uses outlined in this study.

Implement height and obstruction ordinances which reflect current Air Force and Federal Aviation Administration (FAA) Part 77 requirements.

Modify building codes to ensure that new construction within the AICUZ area has the recommended noise level reductions incorporated into its design and construction.

Continue to inform **[NAME]** AFB of planning and zoning actions that have the potential of affecting base operations. Develop a working group representing city planners, county planners, and base planners to meet at least quarterly to discuss AICUZ concerns and major development proposals that could affect airfield operations.

**[NAME] AFB AICUZ**

**VOLUME II**

**APPENDICES**

This is the companion document to Volume I of the Air Installation Compatible Use Zone (AICUZ) Study prepared for **[NAME]** AFB, **[STATE]**, in **[DATE]**. It contains supplemental AICUZ information.

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## APPENDIX A

## THE AICUZ CONCEPT, PROGRAM, METHODOLOGY, AND POLICIES

### A.1 Concept

Federal legislation, national sentiment, and other external forces which directly affect the United States Air Force mission have served to greatly increase the Air Force's role in environmental and planning issues. Problems of airfield encroachment from incompatible land uses surrounding installations, as well as air and water pollution and socio-economic impact, require continued and intensified USAF involvement. The nature of these problems dictates direct USAF participation in comprehensive community and land use planning. Effective, coordinated planning that bridges the gap between the federal government and the community requires the establishment of good working relationships with local citizens, local planning officials, and state and federal officials. This planning depends upon creating an atmosphere of mutual trust and helpfulness. The Air Installation Compatible Use Zone (AICUZ) concept has been developed in an effort to:

Protect local citizens from the noise exposure and accident potential associated with flying activities.

Prevent degradation of the Air Force's capability to achieve its mission by promoting compatible land use planning.

The land use guidelines developed herein are a composite of a number of other land use compatibility studies that have been refined to fit the **[NAME]** AFB aviation environment.

### A.2 Program

Base Commanders establish and maintain active programs to achieve the maximum feasible land use compatibility between air installations and neighboring communities. The program requires that all appropriate governmental bodies and citizens be fully informed whenever AICUZ or other planning matters affecting the installation are under consideration. This includes positive and continuous programs designed to:

Provide information, criteria, and guidelines to federal, state, regional, and local planning bodies, civic associations, and similar groups.

Inform such groups of the requirements of the flying activity, noise exposure, aircraft accident potential, and AICUZ plans.

Describe the noise reduction measures that are being used.

Ensure that all reasonable, economical, and practical measures are taken to reduce or control the impact of noise-producing activities. These measures include such considerations as proper location of engine test facilities, provision for sound suppressers where necessary, and adjustment of flight patterns and/or techniques to minimize the noise impact on populated areas. This must be done without jeopardizing safety or operational effectiveness.

### A.3 Methodology

The AICUZ consists of land areas upon which certain land uses may obstruct the airspace or otherwise be hazardous to aircraft operations; and land areas which are exposed to the health, safety, or welfare hazards of aircraft operations. The AICUZ includes:

Accident potential zones (APZs) and clear zones (CZ) based on past Air Force aircraft accidents and installation operational data (Appendix B).

Noise zones (NZs) produced by the computerized Day-Night Average A-Weighted Sound Level (DNL) metric (Appendix C).

The area designated by the Federal Aviation Administration and the Air Force for purposes of height limitations in the approach and departure zones of the base (Appendix D).

The APZs, CZ, and NZs are the basic building blocks for land use planning with AICUZ data. Compatible land uses are specified for these zones, and recommendations on building materials and standards to reduce interior noise levels inside structures are provided in Appendix E.

As part of the Air Installation Compatible Use Zone program, the only real property acquisition for which the USAF has received congressional authorization and the base and Major Commands request appropriation are the areas designated as the clear zone (CZ). Real property interests are acquired by fee or easement giving the base control over the use of the property. Fee land so acquired may be leased out for agricultural or grazing purposes. **[NAME]** AFB has acquired land use control within its clear zones through easements. Compatible land use controls for the remaining airfield environs should be accomplished through the community land use planning processes.

### A.4 AICUZ Land Use Development Policies

The basis for any effective land use control system is the development of, and subsequent adherence to, policies which serve as the standard by which all land use planning and control actions are evaluated. **[NAME]** AFB recommends the following policies be considered for incorporation into the comprehensive plans of agencies in the vicinity of the base environs:

**A4.1 Policy 1. In order to promote the public health, safety, peace, comfort, convenience, and general welfare of the inhabitants of airfield environs, it is necessary to:**

Guide, control, and regulate future growth and development.

Promote orderly and appropriate use of land.

Protect the character and stability of existing land uses.

Prevent the destruction or impairment of the airfield and the public investment therein.

Enhance the quality of living in the areas affected.

Protect the general economic welfare by restricting incompatible land use.

**A.4.2 Policy 2. In furtherance of Policy 1, it is appropriate to:**

Establish guidelines of land use compatibility.

Restrict or prohibit incompatible land use.

Prevent establishment of any land use which would unreasonably endanger aircraft operations and the continued use of the airfield.

Incorporate the Air Installation Compatible Use Zone concept into community land use plans, modifying them when necessary.

Adopt appropriate ordinances to implement airfield environs land use plans.

**A.4.3 Policy 3. Within the boundaries of the Clear Zone (CZ), certain land uses are inherently incompatible. The following land uses are not in the public interest and must be restricted or prohibited:**

Uses that release into the air any substance, such as steam, dust, or smoke, which would impair visibility or otherwise interfere with the operation of aircraft.

Uses that produce light emissions, either direct or indirect (reflective), which would interfere with pilot vision.

Uses that produce electrical emissions which would interfere with aircraft communication systems or navigation equipment.

Uses that attract birds or waterfowl, such as operation of sanitary landfills, maintenance or feeding stations, or growth of certain vegetation.

Uses that provide for structures within ten feet of aircraft approach-departure and/or transitional surfaces.

**A.4.4 Policy 4. Certain noise levels of varying duration and frequency create hazards to both physical and mental health. A limited, though definite, danger to life exists in certain areas adjacent to airfields. Where these conditions are sufficiently severe, it is not consistent with public health, safety, and welfare to allow the following land uses:**

Residential.

Retail business.

Office buildings.

Public buildings (schools, churches, etc.).

Recreation buildings and structures.

**A.4.5 Policy 5. Land areas below takeoff and final approach flight paths are exposed to significant danger of aircraft accidents. The density of development and intensity of use must be limited in such areas.**

**A.4.6 Policy 6. Different land uses have different sensitivities to noise. Standards of land use acceptability should be adopted, based on these noise sensitivities. In addition, a system of Noise Level Reduction guidelines (Appendix E) for new construction should be implemented to permit certain uses where they would otherwise be prohibited.**

**A.4.7 Policy 7. Land use planning and zoning in the airfield environs cannot be based solely on aircraft-generated effects. Allocation of land used within the AICUZ should be further refined by consideration of:**

Physiographic factors.

Climate and hydrology.

Vegetation.

Surface geology.

Soil characteristics.

Intrinsic land use potential and constraints.

Existing land use.

Land ownership patterns and values.

Economic and social demands.

Cost and availability of public utilities, transportation, and community facilities.

Other noise sources.

Each runway end at **[NAME]** AFB has a 3,000 foot by 3,000 foot clear zone and two accident potential zones (Appendix B). Accident potential on or adjacent to the runway or within the clear zone is so high that the necessary land use restrictions would prohibit reasonable economic use of land. As stated previously, it is Air Force policy to request Congress to authorize and appropriate funds for the necessary real property interests in this area to prevent incompatible land uses. Clear zone easements have been acquired for each runway at **[NAME]** AFB which effectively restrict incompatible land uses.

Accident potential zone I is less critical than the clear zone, but still possesses a significant risk factor. This 3,000 foot by 5,000 foot area has land use compatibility guidelines which 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 concentrate people in small areas are not acceptable.

Accident potential zone II is less critical than accident potential zone I, but still possesses potential for accidents. Accident potential zone II, also 3,000 feet wide, is 7,000 feet long extending to 15,000 feet from the runway threshold. Acceptable uses include those of accident potential zone I, as well as low density single family residential, and those personal and business services and commercial/retail trade uses of low intensity or 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 appropriate.

High people densities should be limited to the maximum extent possible. The optimum density recommended for residential usage (where it does not conflict with noise criteria) in accident potential zone II is one dwelling per acre. For most non-residential usage, buildings should be limited to one story and the lot coverage should not exceed 20 percent.

### A.5 Basic Land Use Compatibility

Research on aircraft accident potential, noise, and land use compatibility is ongoing at a number of federal and other agencies. These studies and all other compatibility guidelines must not be considered inflexible standards. They are the framework within which land use compatibility questions can be addressed and resolved. In each case, full consideration must be given to local conditions such as:

Previous community experience with aircraft accidents and noise.

Local building construction and development practices.

Existing noise environment due to other urban or transportation noise sources.

Time period of aircraft operations and land use activities.

Specific site analysis.

Noise buffers, including topography.

These basic guidelines cannot resolve all land use compatibility questions, but they do offer a reasonable framework within which to work.

### A.6 Accident Potential

Land use guidelines for the two APZs are based on a hazard index system which compares the relationship of accident occurrence for five areas:

On or adjacent to the runway.

Within the clear zone.

In APZ I.

In APZ II.

In all other areas within a 10 nautical mile radius of the runway.

Accident potential on or adjacent to the runway or within the clear zone is so high that few uses are acceptable. The risk outside APZ I and APZ II, but within the 10 nautical mile radius area, is significant, but is acceptable if sound engineering and planning practices are followed.

Land use guidelines for APZs I and II have been developed. The main objective has been to restrict all people-intensive uses because there is greater risk in these areas. The basic guidelines aim at prevention of uses that:

Have high residential density characteristics.

Have high labor intensity.

Involve above-ground explosive, fire, toxic, corrosive, or other hazardous characteristics.

Promote population concentrations.

Involve utilities and services required for area-wide population, where disruption would have an adverse impact (telephone, gas, etc.).

Concentrate people who are unable to respond to emergency situations, such as children, elderly, handicapped, etc.

Pose hazards to aircraft operations.

There is no question that these guidelines are relative. Ideally, there should be no people-intensive uses in either of these APZs. The free market and private property systems prevent this where there is land development demand. To go beyond these guidelines, however, substantially increases risk by placing more people in areas where there may ultimately be an aircraft accident.

### A.7 Noise

Nearly all studies on residential aircraft noise compatibility recommend no residential uses in noise zones above DNL 75 dB. Usually, no restrictions are recommended below noise zone DNL 65 dB. Between DNL 65-75 dB there is currently no consensus. These areas may not qualify for Federal mortgage insurance in residential categories according to the Department of Housing and Urban Development (HUD) Regulation 24 CFR 51B. In many cases, HUD approval requires noise attenuation measures, the Regional Administrator's concurrence, and an Environmental Impact Statement. The Department of Veterans Affairs also has airfield noise and accident restrictions which apply to their home loan guarantee program. Whenever possible, residential land use should be located below DNL 65 dB according to Air Force land use recommendations.

Most industrial/manufacturing uses are compatible in the airfield environs. Exceptions are uses such as research or scientific activities which require lower noise levels. Noise attenuation measures are recommended for portions of buildings devoted to office use, receiving the public, or where the normal background noise level is low.

The transportation, communications and utilities categories have a high noise level compatibility because they generally are not people-intensive. When people use land for these purposes, the use is generally very short in duration. Where buildings are required for these uses, additional evaluation is warranted.

The commercial/retail trade, and personal and business services categories are compatible without restriction up to DNL 70 dB; however, they are generally incompatible above DNL 80 dB. Between DNLs 70-80 dB, noise level reduction measures should be included in the design and construction of buildings.

The nature of most uses in the public and quasi-public services category requires a quieter environment, and attempts should be made to locate these uses below DNL 65 dB (an Air Force land use recommendation), or else provide adequate noise level reduction.

Although recreational use has often been recommended as compatible with high noise levels, recent research has resulted in a more conservative view. Above DNL 75 dB, noise becomes a factor which limits the ability to enjoy such uses. Where the requirement to hear is a function of the use (i.e., music shell, etc.), compatibility is limited. Buildings associated with golf courses and similar uses should be noise attenuated.

With the exception of forestry activities and livestock farming, uses in the resources production, extraction, and open space category are compatible almost without restrictions.

## APPENDIX B

## ACCIDENT POTENTIAL ZONES

### B.1 Guidelines For Accident Potential

Urban areas around airports are exposed to the possibility of aircraft accidents even with well-maintained aircraft and highly trained aircraft crews. Despite stringent maintenance requirements and countless hours of training, past history makes it clear that accidents are going to occur.

When the AICUZ program began, there were no current comprehensive studies on accident potential. In support of the program, the Air Force completed a study of Air Force accidents that occurred between 1968 and 1972 within 10 nautical miles of airfields. The study of 369 accidents revealed that 75 percent of aircraft accidents occurred on or adjacent to the runway (1,000 feet to each side of the runway centerline) and in a corridor 3,000 feet (1,500 feet either side of the runway centerline) wide, extending from the runway threshold along the extended runway centerline for a distance of 15,000 feet.

Three zones were established based on crash patterns: The clear zone, accident potential zone (APZ) I, and accident potential zone (APZ) II. The clear zone starts at the end of the runway and extends outward 3,000 feet. It has the highest accident potential of the three zones. The Air Force has adopted a policy of acquiring property rights to areas designated as clear zones because of the high accident potential. APZ I extends from the clear zone an additional 5,000 feet. It includes an area of reduced accident potential. APZ II extends from APZ I an additional 7,000 feet in an area of further reduced accident potential.

The Air Force research work in accident potential was the first significant effort in this subject area since 1952 when the President's Airport Commission published "The Airport and Its Neighbors," better known as the "Doolittle Report." The recommendations of this earlier report were influential in the formulation of the accident potential zone concept.

The risk to people on the ground of being killed or injured by aircraft accidents is small. However, an aircraft accident is a high consequence event and when a crash does occur, the result is often catastrophic. Because of this, the Air Force does not attempt to base its safety standards on accident probabilities. Instead the Air Force approaches this safety issue from a land use planning perspective.

### B.2 Accident Potential Analysis

Military aircraft accidents differ from commercial air carrier and general aviation accidents because of the variety of aircraft used, the type of missions, and the number of training flights. In 1973, the U.S. Air Force (USAF) performed a aircraft accident hazard study in order to identify land near airfields with significant accident potential. Accidents studied occurred within ten nautical miles of airfields.

The study reviewed 369 major USAF accidents during 1968-1972, and found that 61 percent of the accidents were related to landing operations and 39 percent were takeoff related. It also found that 70 percent occurred in daylight, and that fighter and training aircraft accounted for 80 percent of the accidents.

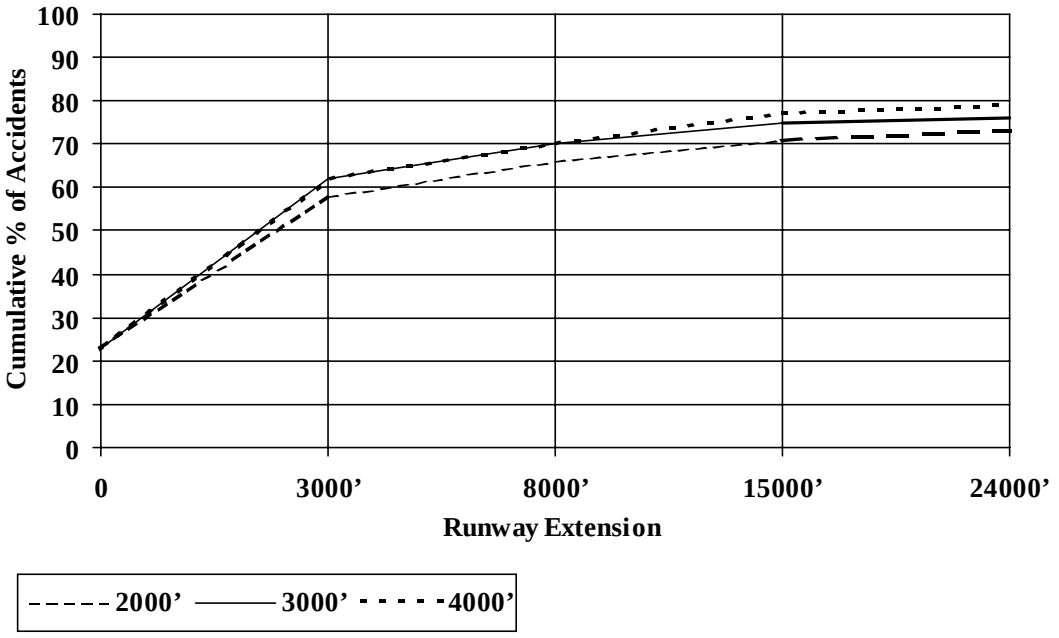
Because the purpose of the study was to identify accident hazards, the study plotted each of the 369 accidents in relation to the airfield. This plotting found that the accidents clustered along the runway and its extended centerline. To further refine this clustering, a tabulation was prepared which described the cumulative frequency of accidents as a function of distance from the runway centerline along the extended centerline. This analysis was done for widths of 2,000, 3,000, and 4,000 total feet. The location analysis found the following:

**Table B-1 LOCATION ANALYSIS**

| Length From both Ends of Runway (feet) | Width of Runway Extension (feet) 2,000 | 3,000 | 4,000 |
|---|---|---|---|
| **Percent of Accidents** | | | |
| On or adjacent to runway (1,000 feet to each side of runway centerline) | 23 | 23 | 23 |
| 0 to 3,000 | 35 | 39 | 39 |
| 3,000 to 8,000 | 8 | 8 | 8 |
| 8,000 to 15,000 | 5 | 5 | 7 |
| **Cumulative percent of accidents** | | | |
| On or adjacent to runway (1,000 feet to each side of runway centerline) | 23 | 23 | 23 |
| 0 to 3,000 | 58 | 62 | 62 |
| 3,000 to 8,000 | 66 | 70 | 70 |
| 8,000 to 15,000 | 71 | 75 | 77 |

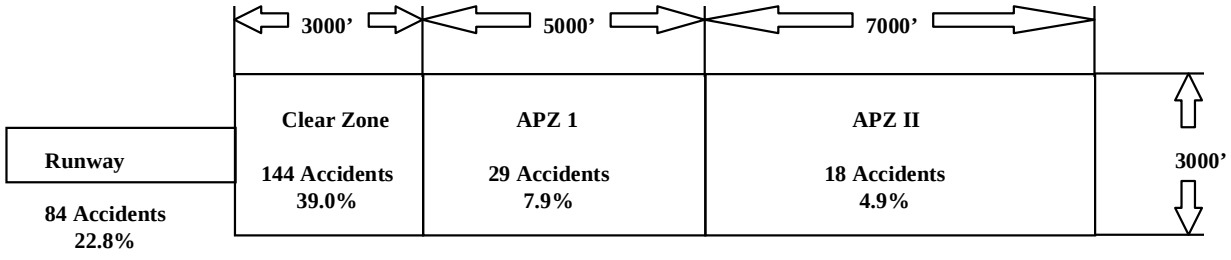
Figure B-1 indicates that the cumulative number of accidents rises rapidly from the end of the runway to 3,000 feet, rises more gradually to 8,000 feet, then continues at about the same rate of increase to 15,000 feet, where it levels off rapidly. The location analysis also indicates that the optimum width of the runway extension, which would include the maximum percentage of accidents in the smallest area, is 3,000 feet.

**Figure B-1**
**Distribution of Air Force Aircraft Accidents**



Using the optimum runway extension width, 3,000 feet, and the cumulative distribution of accidents from the end of the runway, zones were established which minimized the land area included and maximized the percentage of accidents included. The zone dimensions and accident statistics for the 1968-1972 study are shown in Figure B-2.

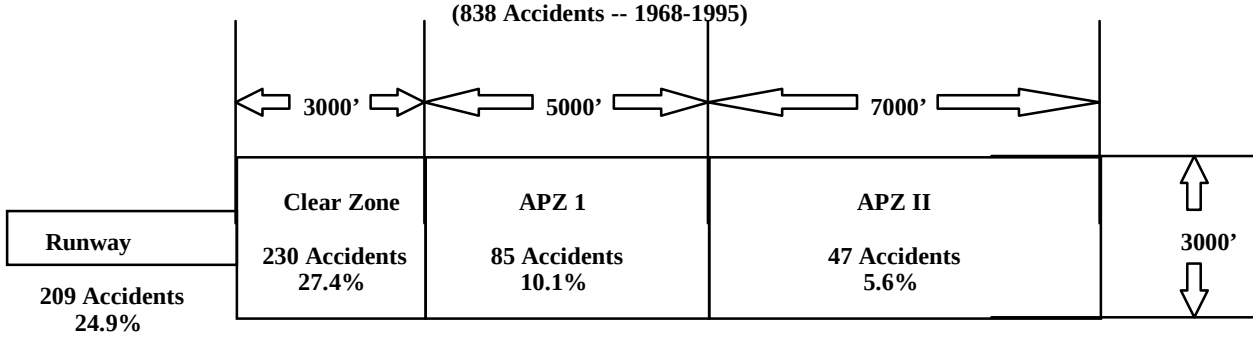
**Figure B-2**
**Air Force Accident Data**
**(369 Accidents -- 1968-1972)**




**Other Accidents within 10 Nautical Miles**
**94 Accidents -- 25.4%**

The original study was updated to include accidents through September 1995. The updated study now includes 838 accidents during the 1968-1995 period. Using the optimum runway extension width of 3,000 feet, the accident statistics of the updated study are shown below

**Figure B-3**
**Air Force Accident Data**
**(838 Accidents -- 1968-1995)**




**Other Accidents within 10 Nautical Miles**
**267 Accidents -- 31.9%**

**[NAME] AFB, [STATE]**

Using the designated zones and accident data, it is possible to calculate a ratio of percentage of accidents to percentage of area size. These ratios indicate that the clear zone, with the smallest area size and the highest number of accidents, has the highest ratio, followed by the runway and adjacent area, APZ I and then APZ II.

**Table B-2**
**ACCIDENT TO AREA RATIO**

**Ratio of Percentage of Accidents to Percentage of Area**
(Air Force Accident Data 1968 - 1995)

| | Area[1] (acres) | Number[2] Accident | Accident Per Acre | % Total Area | % Total Accident | Ratio:[3] Accident to Area |
|---|---|---|---|---|---|---|
| Runway Area [4] | 487 | 209 | 1 Per 2.3 | 0.183 | 24.9 | 136 |
| Clear Zone | 413 | 226 | 1 Per 1.8 | 0.155 | 27.4 | 177 |
| APZ I | 689 | 85 | 1 Per 8.1 | 0.258 | 10.1 | 39 |
| APZ II | 964 | 47 | 1 Per 20.5 | 0.362 | 5.6 | 15 |
| Other | 264,053 | 267 | 1 Per 989 | 99.0425 | 31.9 | 0.3 |

NOTES: 1. Area includes land within 10 nautical miles of runway (Total of 266,606 acres).
2. Total number of accidents is 838 (through 1995).
3. Percent total accidents divided by percent total area.
4. Runway dimension are 2000' X 10,600'.

### B.3 Definable Debris Impact Areas

The Air Force also determined which accidents had definable debris impact areas, and in what phase of flight the accident occurred. Overall, 75 percent of the accidents had definable debris impact areas, although they varied in size by type of accident. The Air Force used weighted averages of impact areas, for accidents occurring only in the approach and departure phase, to determine the following average impact areas:

| Average Impact Areas for Approach and Departure Accidents | |
|---|---|
| Overall Average Impact Area | 5.06 acres |
| Fighter, Trainer and Misc. Aircraft | 2.73 acres |
| Heavy Bomber and Tanker Aircraft | 8.73 acres |

### B.4 Findings

Designation of safety zones around the airfield and restriction of incompatible land uses can reduce the public's exposure to safety hazards.

Air Force accident studies have found that aircraft accidents near Air Force installations occurred in the following patterns:

61% were related to landing operations.

39% were related to takeoff operations.

70% occurred in daylight.

80% were related to fighter and training aircraft operations.

25% occurred on the runway or within an area extending 1,000 feet out from each side of the runway.

27% occurred in an area extending from the end of the runway to 3,000 feet along the extended centerline and 3,000 feet wide, centered on the extended centerline.

15% occurred in an area between 3,000 and 15,000 feet along the extended runway centerline and 3,000 feet wide, centered on the extended centerline.

U.S. Air Force aircraft accident statistics found that 75% of aircraft accidents resulted in definable impact areas. The size of the impact areas were:

5.1 acres overall average.

2.7 acres for fighters and trainers.

8.7 acres for heavy bombers and tankers.

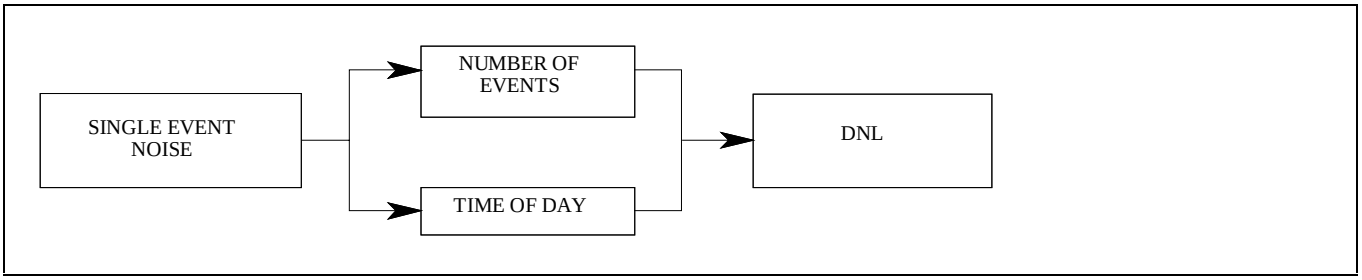
## APPENDIX C
## DESCRIPTION OF THE NOISE ENVIRONMENT

### C.1 Noise Environment Descriptor

The noise contour methodology used herein is the Day-Night Average A-Weighted Sound Level (DNL) metric of describing the noise environment. Efforts to provide a national uniform standard for noise assessment have resulted in adoption by the Environmental Protection Agency of DNL as the standard noise descriptor. The Air Force uses the DNL descriptor in assessing the amount of aircraft noise exposure, and as a metric for community response to the various levels of exposure. The DNL values used for planning purposes are 65, 70, 75, and 80 dB. Land use guidelines are based on the compatibility of various land uses with these noise exposure levels.

It is generally recognized that a noise environment descriptor should consider, in addition to the annoyance of a single event, the effect of repetition of such events and the time of day in which these events occur. DNL begins with a single event descriptor and adds corrections for the number of events and the time of day. Since the primary development concern is residential, nighttime events are considered more annoying than daytime events and are weighted accordingly. DNL values are computed from the single event noise descriptor, plus corrections for number of flights and time of day (Figure C-1).

**Figure C-1 DAY-NIGHT AVERAGE A WEIGHTED SOUND LEVEL (ONLY)**



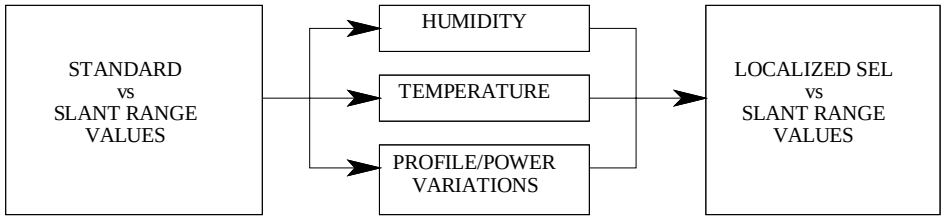

As part of the extensive data collection process, detailed information is gathered on the type of aircraft, the number, and time of day of flying operations for each flight track during a typical day. This information is used in conjunction with the single event noise descriptor to produce DNL values. These values are combined on an energy summation basis to provide single DNL values for the mix of aircraft operations at the base. Equal value points are connected to form the contour lines.

### C.3 Noise Event Descriptor

The single event noise descriptor used in the DNL system is the Sound Exposure Level (SEL). The SEL measure is an integration of an "A" weighted noise level over the period of a single event such as an aircraft flyover, in dB.

Frequency, magnitude, and duration vary according to aircraft type, engine type, and power setting. Therefore, individual aircraft noise data are collected for various types of aircraft/engines at different power settings and phases of flight. The following diagram shows the relationship of the single event noise descriptor (SEL) to the source sound energy.

**Figure C-2**
**Sound Exposure Level**




SEL vs. slant range values are derived from noise measurements made according to a source noise data acquisition plan developed by Bolt, Beranek, and Newman, Inc., in conjunction with the Air Force's Armstrong Laboratory (AL) and carried out by AL. These standard day, sea level values form the basis for the individual event noise descriptors at any location and are adjusted to the location by applying appropriate corrections for temperature, humidity, and variations from standard profiles and power settings.

Ground-to-ground sound propagation characteristics are used for altitudes up to 500 feet absolute with linear transition between 500 and 700 feet and air-to-ground propagation characteristics above 700 feet.

In addition to the assessment of aircraft flight operations, the DNL system also incorporates noise resulting from engine/aircraft maintenance checks on the ground. Data concerning the orientation of the noise source, type of aircraft or engine, number of test runs on a typical day, power settings used and their duration, and use of suppression devices are collected for each ground run up or test position. This information is processed and the noise contribution added (on an energy summation basis) to the noise generated by flying operations to produce noise contours reflecting the overall noise environment with respect to aircraft air and ground operations.

## C.4 Noise Contour Production

Data describing flight track distances and turns, altitudes, airspeeds, power settings, flight track operational utilization, maintenance locations, ground run-up engine power settings, and number and duration of runs by type of aircraft/engine is assembled by each individual AFB. The data is screened by the MAJCOM and HQ AFCEE/ECC. Trained personnel process the data for input into a central computer. Flight track maps are generated for verification and approval by the base/MAJCOM. After any required changes have been incorporated, DNL contours are generated by the computer using the supplied data and standard source noise data corrected to local weather conditions. These contours are plotted and prepared for photographic reproduction. A set of these contours is provided in the body of the report.

## C.5 Technical Information

Additional technical information on the DNL procedures are available in the following publications:

Community Noise Exposure Resulting from Aircraft Operations: Applications Guide for Predictive Procedure, AMRL-TR-73-105, November, 1974, from National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22151.

Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with Adequate Margin of Safety, EPA Report 550/9-74-004, March, 1974, from Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

Adopted Noise Regulations for California Airports, Title 4, Register 70, No. 48-11-28-70, Subchapter 6, Noise Standards.

## APPENDIX D

## HEIGHT AND OBSTRUCTIONS CRITERIA

### D.1 Height And Obstructions Criteria

#### D.1.1 General

This appendix establishes criteria for determining whether an object or structure is an obstruction to air navigation. Obstructions to air navigation are considered to be:

Natural objects or man-made structures that protrude above the planes or surfaces as defined in the following paragraphs, and/or;

Man-made objects that extend more than 500 feet above the ground at the site of the structure.

#### D.1.2 Explanation of Terms

The following will apply (See Figure D-1):

Controlling Elevation. Whenever surfaces or planes within the obstructions criteria overlap, the controlling (or governing) elevation becomes that of the lowest surface or plane.

Runway Length. **[NAME]** AFB has two runways, and **[Length of runway]** feet of pavement designed and built for sustained aircraft landings and takeoffs.

Established Airfield Elevation. The elevation, in feet above mean sea level for **[NAME]** AFB is **[Elevation of the Airfield]** feet.

Dimensions. All dimensions are measured horizontally unless otherwise noted.

#### D.1.3 Planes and Surfaces.

Definitions are as follows:

Primary Surface. This surface defines the limits of the obstruction clearance requirements in the immediate vicinity of the landing area. The primary surface comprises surfaces of the runway, runway shoulders, and lateral safety zones and extends 200 feet beyond the runway end. The width of the primary surface for a single class "B" runway is 2,000 feet, or 1,000 feet on each side of the runway centerline.

Clear Zone Surface. This surface defines the limits of the obstruction clearance requirements in the vicinity contiguous to the end of the primary surface. The length and width (for a single runway) of a clear zone surface at **[NAME]** AFB is 3,000 feet by 3,000 feet.

Approach-Departure Clearance Surface. This surface is symmetrical about the runway centerline extended, begins as an inclined plane (glide angle) 200 feet beyond each end of the primary surface of the centerline elevation of the runway end, and extends for 50,000 feet. The slope of the approach-departure clearance surface is 50:1 along the extended runway (glide angle) centerline until it reaches an elevation of 500 feet above the established airfield elevation. It then continues horizontally at this elevation to a point 50,000 feet from the start of the glide angle. The width of this surface at the runway end is 2,000 feet; it flares uniformly, and the width at 50,000 feet is 16,000 feet.

Inner Horizontal Surface. This surface is a plane, oval in shape at a height of 150 feet above the established airfield elevation. It is constructed by scribing an arc with a radius of 7,500 feet above the centerline at the end of the runway and interconnecting these arcs with tangents.

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

Outer Horizontal Surface. This surface is a plane located 500 feet above the established airfield elevation. It extends for a horizontal distance of 30,000 feet from the outer periphery of the conical surface.

Transitional Surfaces. These surfaces connect the primary surfaces, clear zone surfaces, and approach-departure clearance surfaces to the outer horizontal surface, conical surface, other horizontal surface, or other transitional surfaces. The slope of the transitional surface is 7:1 outward and upward at right angles to the runway centerline. To determine the elevation for the beginning the transitional surface slope at any point along the lateral boundary of the primary surface, including the clear zone, draw a line from this point to the runway centerline. This line will be at right angles to the runway axis. The elevation at the runway centerline is the elevation for the beginning of the 7:1 slope.

The land areas outlined by these criteria should be regulated to prevent uses which might otherwise be hazardous to aircraft operations. The following uses should be restricted and/or prohibited.

Uses which release into the air any substance which would impair visibility or otherwise interfere with the operation of aircraft (i.e. steam, dust, or smoke).

Uses which produce light emissions, either direct or indirect (reflective), which would interfere with pilot vision.

Uses which produce electrical emissions which would interfere with aircraft communications systems or navigational equipment.

Uses which would attract birds or waterfowl, including but not limited to, operation of sanitary landfills, maintenance of feeding stations, or the growing of certain vegetation.

Uses that provide for structures within ten feet of aircraft approach-departure and/or transitional surfaces.

### D.2 Height Restrictions

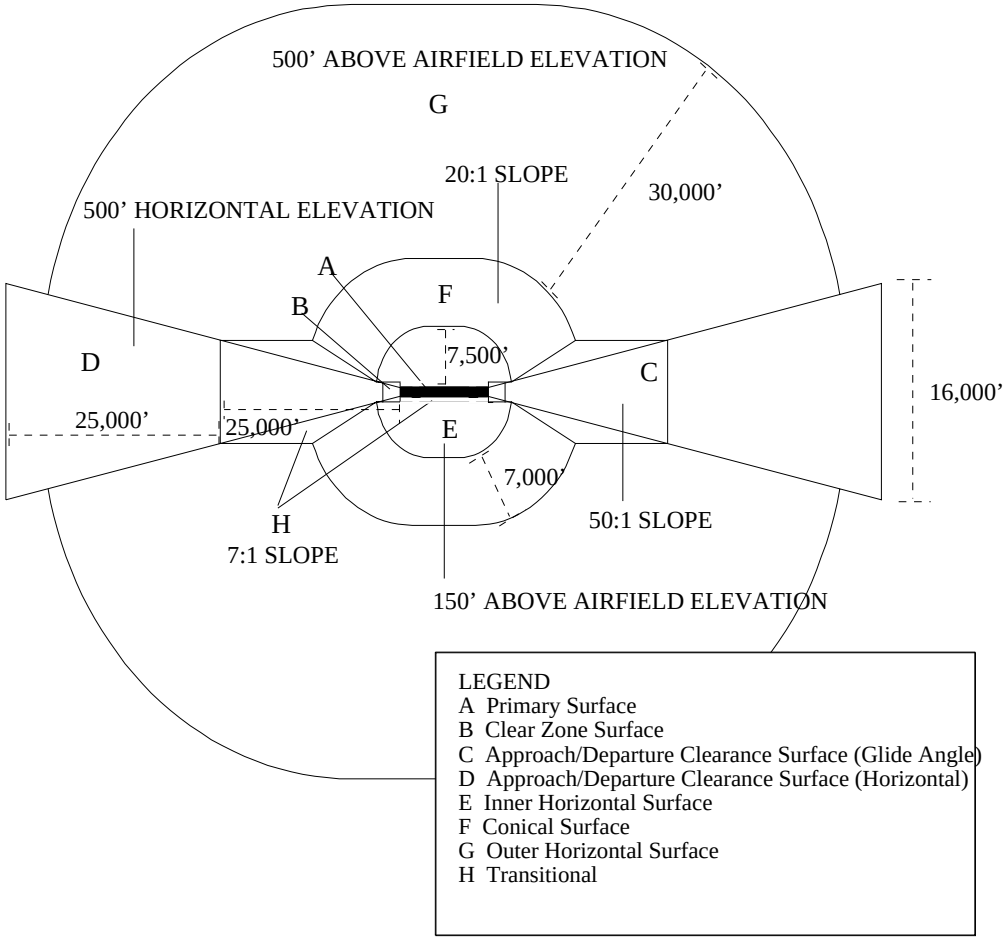
City/County agencies involved with approvals of permits for construction should require developers to submit calculations which show that projects meet the height restriction criteria of FAA Part 77 as described, in part, by the information contained in this Appendix.

**[NAME]** AFB, **[STATE]**
Coordinates and Elevations

| | |
|---|---|
| Airfield Elevation | **[List the elevation in feet MSL]** |
| Coordinates: | |
| **[List Runways]** | **[List Latitudes and Longitudes of Runways]** |

**Figure D-1**
**AIRSPACE CONTROL SURFACE PLAN**

For a more complete description of airspace and control surfaces for Class A and Class B runways refer to FAR Part 77, Subpart C or AFI 32-1026.



## APPENDIX E

## NOISE LEVEL REDUCTION GUIDELINES

A study which provides in-depth, state-of-the-art noise level reduction guidelines was completed for the Naval Facilities Engineering Command and the Federal Aviation Administration, by Wyle Laboratories in November 1989. The study title is, *Guidelines for the Sound Insulation of Residences Exposed to Aircraft Operations*, Wyle Research Report WR 89-7. Copies of this study are available for review, upon request, from the Civil Engineering Office at **[NAME]** AFB.

**[NAME] AFB AICUZ STUDY**

**VOLUME III**

**IMPLEMENTATION AND MAINTENANCE PLAN**

This is a companion document to the Air Installation Compatible Use Zone (AICUZ) Study prepared for **[NAME]** AFB, **[STATE]**. It contains information designed to assist the base in its AICUZ public release process and implementation plan. It is not intended for public distribution.

TABLE OF CONTENTS

## SECTION 1 INTRODUCTION

Considerable effort has been expended by HQ USAF, **[PARENT COMMAND]**, and **[NAME]** AFB in developing compatible land use guidelines for the land surrounding the base. An effective procedure for public release of the information contained within the AICUZ Study is essential for encouraging local governments to use that information in their planning efforts.

**[NAME]** AFB is responsible for informing local citizens of the need for taking positive action to prevent incompatible land uses around the base. It is important to involve local officials and private citizens from all adjacent communities in the AICUZ program. Participants in this effort should be aware that the AICUZ program is designed to protect the health and safety of community residents, as well as to protect the airfield from encroachment.

Within the past few years some local governmental jurisdictions have restricted construction along flood plains, on steep slopes, in potential earthquake hazard areas, and in areas with high water tables. In terms of safety and health, airfield operations should be of equal concern to local planning agencies and should be included as a factor in land use planning. The regulation of land use has traditionally been exercised by the state through delegation to local governments. Action needs to be taken now to advise local governments that corrective measures are essential to protect the health, safety, and welfare of the public from aircraft noise and accident hazards, and, in turn, to protect the military installation from the adverse impacts of random urbanization of nearby lands.

## SECTION 2 CONCEPTS/ACTIONS

This AICUZ Public Release and Implementation Plan is designed to assist the base in its efforts to acquaint local communities and their officials with the **[NAME]** AICUZ program. In addition, a well executed public release process will give the base community planner a strong foundation for follow-on efforts.

The first step in providing AICUZ information is to initiate informal discussions with key officials and planning staffs of the affected governmental units. These meetings are used to set forth the basic principles of the AICUZ program, i.e., that it is a planning tool, that the program is based upon cooperative effort between the Air Force and local communities, and that the role of the Air Force is to provide information for use in land use planning within the vicinity of **[NAME]** AFB. (It is important to stress that it is not the intent of the AICUZ program to preempt the land use control prerogative of local governments.) This initial step is accomplished through an AICUZ concept briefing which will be prepared by representatives from Civil Engineer and Public Affairs. The informal briefing will be conducted by representatives from Civil Engineer, Public Affairs, or the Command Section. The briefing should contain examples of AICUZ programs at other bases and an update on the existing AICUZ study at **[NAME]** AFB. The date, setting, attendees, and procedures for the public release of the study should also be discussed and established at this time.

Specific AICUZ data, including noise contour maps for **[NAME]**, should NOT be made available to anyone outside the Air Force prior to full public release. It is imperative that there is no possibility for any group to be given a special advantage by receiving prior knowledge. Prior to public release, the AICUZ study is considered an internal working paper and under the provisions of AFI 37-131, is exempt from the Freedom of Information Act.

Prior to the actual public release, base personnel designated to attend the public release should conduct a thorough review of the impacts the AICUZ program could have on local communities and landowners. These individuals, in their review, should answer the following questions:

What is the existing land use?

What is the future planned land use?

What factors determine future land use?

What are alternatives for future land use?

Who decides what future land uses are?

Which property owners are involved?

This review should also include possible effects upon municipalities, counties, regional councils, water districts, utility companies, highway/transportation planning agencies, etc. A determination should also be made concerning to what extent the recommended AICUZ criteria is in agreement with current local land use planning and zoning ordinances. This "brainstorming" will assist in answering questions which may be asked during the public release process.

The basic forum for full release of the AICUZ study is a public presentation meeting. Attendees should include appropriate governmental officials, the general public, and the media. This meeting will also be the occasion for the first distribution of the actual AICUZ study. The official release at this time will ensure that no one is excluded from the process, and that no one single interested or impacted group is provided with information prior to others. A follow-on meeting to respond to questions, if necessary, should also be arranged.

The Air Force Center for Environmental Excellence (AFCEE RCO) will arrange for appropriate federal agency representation at the initial public meeting. This is accomplished in accordance with AFI 32-7063.

Following the initial public meeting, the AICUZ study is forwarded to local and state clearinghouses as part of the Executive Order 12372 process.

## SECTION 3 ORGANIZATION

The installation commander releases the AICUZ study or update during the public meeting. The briefer selected to explain the AICUZ process should be thoroughly familiar with the base-specific data gathering and current base area compatible and incompatible land uses, and the appropriate information contained within the documents. The Base Civil Engineer, Operations Group Commander, Public Affairs, and Staff Judge Advocate assist the commander by developing and implementing the public release and by participating at the public meeting. Complete awareness of the recommended AICUZ criteria is essential because public misinformation or lack of information can be detrimental to objectives desired. The Public Affairs Office (PAO) is responsible for all public news releases and responses to public inquiries. The PAO should work with the media to ensure timely notice to the public of the date, location, and purpose of the AICUZ public meeting.

Remember that presentations on the AICUZ program are given to inform and enlist the cooperation and support of local political officials, special interest groups, and others. Groups which are formally briefed on the AICUZ study are reflected in Section 4. A general schedule for presentations of the AICUZ study is included in Section 5. Those presenting the AICUZ report must be well acquainted with the information contained within the AICUZ study. They should be able to deal knowledgeably with the questions of laymen and professional alike.

The Air Force should state its views and recommendations with respect to what should be done to establish compatible land use within the vicinity of the airfield, but this is expressed in a low-key manner and without any pressure brought to bear on local governmental officials. Use of information contained within the AICUZ report is the responsibility of local officials.

## SECTION 4 INDIVIDUALS/ORGANIZATIONS TO BE GIVEN AICUZ PRESENTATIONS

The following persons/organizations play key roles in the land development process in areas surrounding **[NAME]** AFB. Many of them will be consulted in informal briefings and presentations and all will be invited to the AICUZ Public Release.

**4.1 LOCAL GOVERNMENT: [List Elected and Appointed Officials to be notified and given AICUZ presentations, showing addresses and phone numbers]**

**4.2 COUNTY GOVERNMENT: [List Elected and Appointed Officials to be notified and given AICUZ presentations, showing addresses and phone numbers]**

**4.3 STATE GOVERNMENT: [List Elected and Appointed Officials to be notified and given AICUZ presentations, showing addresses and phone numbers]**

**4.4 FEDERAL GOVERNMENT: [List Elected and Appointed Officials to be notified and given AICUZ presentations, showing addresses and phone numbers]**

**4.5 CHAMBER OF COMMERCE (CoC) AND MILITARY AFFAIRS COMMITTEES (MAC): [List Officials to be notified and given AICUZ presentations, showing addresses and phone numbers]**

**4.6 INTEREST GROUPS: [List Officials to be notified and given AICUZ presentations, showing addresses and phone numbers]**

**4.7 KEY LANDOWNERS/DEVELOPERS: [List individuals to be notified and given AICUZ presentations, showing addresses and phone numbers]**

**4.8 MEDIA: [List individuals to be notified and given AICUZ presentations, showing addresses and phone numbers]**

Newspapers

Television

Radio

## SECTION 5 SCHEDULE OF EVENTS

The following is a suggested schedule for the presentation of the AICUZ report to the community:

| DATE | EVENT |
|---|---|
| X | After all AICUZ Study changes are made and once approval of the final AICUZ documents has been given by HQ USAF/ILEVP, print final documents: Citizen's Brochure (#) copies; AICUZ Report (Vol. I) (#) copies; Appendices (Vol. II, A-E) (#) copies; and Implementation and Maintenance Plan (Vol. III) (#) copies. |
| X + 30 DAYS | Set up and inform higher headquarters of the date, time, and location of the public release meeting. |
| X + 60 DAYS | Internal distribution of final documents: Ensure that 12 final copies are sent to HQ USAF/ILEVP via commercial express courier to facilitate advance congressional notification. Also send additional copies, to MAJCOM (2) and AFCEE RCO (6) via regular mail for federal agency notification. |
| X + 65 DAYS | Pre-brief local officials and Airport Land Use Commissions (if appropriate). Send out invitations for public meeting and make public ann ouncement (news release). |
| X + 75 + DAYS | Hold initial public meeting, distribute AICUZ, respond to news/media queries. Distribute additional copies of AICUZ documents per Interagency and Intergovernmental Coordinated Environmental Planning (IICEP) process, per AFI 32-7063. |

The Public Affairs Office will ensure that appropriate news releases are made. Many people may be affected by the AICUZ study and it is important that local governmental leaders and planning bodies be the center of focus rather than the Air Force. It is also imperative that this information be communicated in a low key manner as being one way of enhancing the future development of **[Relevant Counties]**.

All AICUZ program briefings are coordinated with the Public Affairs Office. Only speakers who are knowledgeable of the AICUZ program and its intent, and are adept at public presentations, should be asked to speak.

**SECTION 6 PROPOSED SCHEDULE EVENTS/FORMAT FOR AICUZ PUBLIC RELEASE MEETING**

DATE/TIME
LOCATION
FORMAT
BRIEFING OFFICER
KEY PERSONNEL & SUPPORT PANEL
Provide support to speaker during question and answer period - Panel members should include:
**[List personnel and organizations that will be panel members]**

MEETING ATTENDEES
Local government officials, media, landowners in AICUZ study area, homeowners associations, etc.

**SECTION 7 AICUZ PUBLIC RELEASE INVITATION**

Dear (See lists, Sect 4)

**[NAME]** AFB's Air Installation Compatible Use Zone (AICUZ) Study has been updated and will be released in a public meeting at **[TIME]** on **[DATE]** 199( ), at **[ADDRESS]**. The AICUZ study addresses aircraft noise and accident potential zones created by current flying operations at **[NAME]** AFB. The study contains information on building height restrictions and provides data for use in establishing land uses which are compatible with the current flying mission.

AICUZ data is intended for use by local citizens and governmental officials involved in land use planning and facility development. The purpose of the AICUZ program is to help ensure the health, safety, and welfare of the citizens in the surrounding communities while preserving the operational capabilities of **[NAME]** AFB.

The presentation will outline the overall AICUZ program, its methodology, potential uses of the study, and Air Force and community responsibilities for compatible land use. A question and answer period will follow the formal presentation.

As **[Relevant Counties and Cities]** continue to grow and prosper, we believe it is important that we join with government and business leaders in a cooperative effort to implement mutually beneficial planning for the future. I hope you will be able to attend this very important and informative meeting. In the event you are not able to attend, copies of the AICUZ Report are available upon request by calling **[NAME]** Public Affairs Office at **[Phone Number]**.

Sincerely,

**[Commander Signature Block]**

## SECTION 8 IMPLEMENTATION STRATEGIES

Write transmittal letter to local government officials advising that the **[DATE of Last AICUZ]** AICUZ Report has been revised.

Brief the AICUZ study to local and regional planners, county commissioners, and city council members prior to adoption or revision of any local comprehensive plan or before the onset of a Joint Land Use Study (JLUS) if applicable.

Work closely with local and regional community planners. Follow development of comprehensive planning efforts within the area, and encourage use of the information provided in the AICUZ in decision-making, wherever possible.

Add **[NAME]** AFB to the list of local, regional, state and federal intergovernmental coordination participants and continue to keep **[NAME]** AFB "in the loop". (Use AFCEE RCO, to assist in your IICEP efforts).

Keep AFCEE RCO in the loop by providing informational copies of correspondence concerning ongoing AICUZ activities at **[NAME]** AFB. Under the IICEP program, AFCEE RCO will coordinate with and distribute AICUZ information to federal agency regional offices (HUD, VA, FHA, etc.), per their responsibilities to the AICUZ program as specified by FMC 75-2.

## SECTION 9 AICUZ REVIEW STRATEGIES (ONGOING)

AICUZ data should be reviewed and revalidated every two years (including re-run of an AICUZ noise map) unless required sooner in conjunction with an EIAP action.

Every two years, conduct an analysis of land use compatibility within the vicinity of **[NAME]** AFB. Maintain a working relationship with surrounding communities to re-establish compatible land use designations as incompatible designations are identified.

The base should conduct and submit to **[Parent MAJCOM]** a brief AICUZ survey on a biennial basis. This survey should summarize the status of the AICUZ program emphasizing foreseeable changes in the program including any issues involving civilian development which could impact on the mission (This survey is required by HQ USAF/ILEVP).

The base should attend all zoning hearings which can potentially affect **[NAME]** AFB.

The base should provide information to communities on modification of flight procedures that may affect noise in the area.

The base should maintain constant, positive contact with key public officials.

Keep senior base leaders fully informed on the AICUZ program.

Closely monitor area comprehensive planning processes to ensure that **[NAME]** AFB's interests continue to be represented.

## SECTION 10 CURRENT [NAME] AFB AICUZ CONCERNS

**[List the concerns the base has and monitor these issues]**

**CITIZEN'S BROCHURE** **[PAGE Number]**

**What is AICUZ?**

Air Installation Compatible Use Zone (AICUZ) is a program concerning people, their comfort, safety, and protection. This brochure briefly summarizes the AICUZ study--an extensive analysis of the effects of noise, aircraft accident potential, and land use and development upon present and future neighbors of **[NAME]** Air Force Base. AICUZ seeks a cooperative understanding and a reasonable solution to this intricate problem.

**Is there a problem?**

Military airfields attract development to immediate surrounding areas. In the absence of compatible land use controls, inappropriate uses may be made of property near or adjacent to the installation causing eventual conflicts between flight operations and landowners. Because land close to **[NAME]** AFB is subject to high noise levels and aircraft accident potentials, certain types of development are not suitable.

**What has been done?**

**[NAME]** AFB has attempted to be a good neighbor by restricting flying activities that could adversely affect its neighbors. For example, flying operations are normally conducted between the hours of 7:00 AM and 10:00 PM**.** Practice approach and departure operations are normally conducted during daylight hours when expected noise disruptions are less than they would be during evening hours. **[NAME]** AFB spent more than $**___** on a hush house in **[DATE]** and $**__** million on **[ITEM]** in **[DATE]** to minimize the impact from the noise of ground engine runups. Flight pattern altitudes and the runway approach angles have been adjusted over the years in an effort to reduce noise impacts while maintaining safe operations. The base has demonstrated a spirit of cooperation by participating with communities in the area-wide planning process. Continued cooperation by **[NAME]** AFB, local governments, and the local populace will further reduce potential land use conflicts. This action will help insure that future land use is compatible and beneficial.

**What are the benefits?**

In addition to protecting the public safety and health, primary benefits include protecting the taxpayer's investment in national defense provided by **[NAME]** AFB and protecting economic benefits to the surrounding communities generated by base activities and employment. The local economy is enhanced by **[NAME]** AFB's expenditures for salaries, contracts, construction, retirement pay, tuition aid to schools, health insurance payments, and off-base accommodations for travelers. **[NAME]** AFB employed over **_____** people in fiscal year **[DATE]** with an annual payroll of $**__** million. Furthermore, **[NAME]** AFB spent approximately $**__** million on construction and service, equipment, and supply contracts. While shrinking budgets challenge the leadership at **[NAME]** AFB, the base continues to be a strong partner in the economic future of the region.

**CITIZEN'S BROCHURE** **[PAGE Number]**

**Why AICUZ now?**

Land development in the vicinity of **[BASE]** AFB is ongoing and expected to accelerate. Modifications to flight operations at **[NAME]** AFB have resulted in changes to the noise contours outlined in the **[DATE]** AICUZ report. Information provided in the AICUZ report is intended to offer assistance to those planning the future of **[RELEVANT COUNTIES]** and their communities. By using the updated AICUZ map and information provided in the AICUZ Study, neighboring communities are better equipped to make land use decisions and adopt land use controls which are compatible with **[NAME]** AFB, yet able to accommodate growth.

**What does AICUZ mean to me?**

AICUZ means protection of the public safety and health as well as protection of the Air Force's national defense mission. The AICUZ itself is a composite of many factors: average noise levels, accident potential, and aircraft flight paths and altitudes. Noise and accident potential zones reflecting current conditions have been combined and displayed on the contour map shown on page **[number]**.

The numbers 65 dB through 80 dB indicate the average sound levels in decibels using the Day-Night Average A-Weighted Sound Level (DNL) metric for describing the noise environment. DNL is the energy-averaged sound level measured over 24 hours, with a 10 dB penalty applied to nighttime (10:00 p.m. to 7:00 a.m.) sound events to account for increased annoyance from late night noise.

The clear zones and accident potential zones (APZs) are based upon statistical analysis of past DoD aircraft accidents. The clear zone, the area closest to the runway end, is the most hazardous. The overall risk is so high that DoD generally acquires the land through purchase or easement to prevent development. APZ I is an area beyond the clear zone that possesses a significant potential for accidents. APZ II is an area beyond APZ I having a lower, but still significant, potential for accidents. While aircraft accident potential in APZs I and II does not warrant acquisition by the Air Force, land use planning and controls are strongly encouraged in these areas for the protection of the public. An additional constraint involves areas which the Federal Aviation Administration (FAA) and DoD have identified for height limitations. Air Force obstruction criteria are based upon those contained in Federal Aviation Regulation Part 77, Subpart C.

The accompanying generalized land use charts and AICUZ map provide a quick reference to the various noise and accident potential zones around **NAME** AFB. More detailed information can be found in the **[NAME]** AFB **[DATE]** AICUZ Study, Volume I.

**COMPATIBILITY CHART***
**LAND USE/AIRCRAFT NOISE**

| | DNL NOISE CONTOURS | | | |
|---|---|---|---|---|
| **Generalized Land Use** | **65-69 dB** | **70-74 dB** | **75-79 dB** | **80+ dB** |
| **Residential** | **No[1]** | **No[1]** | **No** | **No** |
| **Manufacturing** | **Yes** | **Yes** | **Yes** | **Yes** |
| **Transportation, Communications, and Utilities** | **Yes** | **Yes** | **Yes** | **No** |
| **Trade, Business, and Offices** | **Yes** | **Yes** | **Yes** | **No** |
| **Shopping Districts** | **Yes** | **Yes** | **Yes** | **No** |
| **Public and Quasi-Public Service** | **Yes** | **No[1]** | **No[1]** | **No** |
| **Recreation** | **Yes** | **Yes** | **No** | **No** |
| **Public Assembly** | **Yes** | **No** | **No** | **No** |
| **Agriculture and Mining** | **Yes** | **Yes** | **Yes** | **Yes** |

**[1]Unless sound attenuation materials are installed.**
***This chart is for general information. Refer to Volume I, Figure [NUMBER] for specific land uses and guidelines.**

**COMPATIBILITY CHART***
**LAND USE/ACCIDENT POTENTIAL ZONES**

| | ACCIDENT POTENTIAL ZONES | | |
|---|---|---|---|
| **Generalized Land Use** | **Clear Zone** | **APZ I** | **APZ II** |
| **Residential** | **No** | **No** | **Yes[1]** |
| **Manufacturing** | **No** | **Yes[2]** | **Yes[2]** |
| **Transportation, Communications, and Utilities** | **No** | **Yes[2]** | **Yes[2]** |
| **Trade, Business, and Offices** | **No** | **Yes[2]** | **Yes[2]** |
| **Shopping Districts** | **No** | **No** | **Yes[2]** |
| **Public and Quasi-Public Service** | **No** | **No** | **Yes[2]** |
| **Recreation** | **No** | **Yes[2]** | **Yes[2]** |
| **Public Assembly** | **No** | **No** | **No** |
| **Agriculture and Mining** | **No[3]** | **Yes[2]** | **Yes[2]** |

**[1]Suggested maximum density 1 dwelling unit per acre.**
**[2]Only limited low-density, low-intensity uses recommended.**
**[3]Except limited agricultural uses are permitted.**
***This chart is for general information. Refer to Volume I, Figure [NUMBER] for specific land uses and guidelines.**

**AICUZ MAP (Show Maps Here)**

**CITIZEN'S BROCHURE** **[PAGE Number]**

**The AICUZ report includes the following recommendations:**

**The AICUZ report** *should be adopted as an official guideline for future planning.*

**Zoning ordinances** *should be adopted, or modified to reflect the compatible land uses outlined in the**[NAME]** AFB AICUZ report.*

**Fair disclosure ordinances** *should be enacted to specify disclosure to the public those AICUZ items directly related to operations at **[NAME]** AFB.*

**Height control** *of structures near flight paths should be regulated by incorporating AICUZ recommendations into zoning ordinances.*

**Comprehensive plans** *should include the land use recommendations of the AICUZ report.*

**Subdivision regulations** *should reject new subdivisions not compatible with AICUZ land use objectives and provide controls for continued development in existing subdivisions.*

**Building codes** *should be amended to require noise level reduction.*

**Capital improvement programs** *should be carefully reviewed to discourage incompatible land use patterns, with particular emphasis on utility extension planning.*

**The Joint Land Use Study (JLUS)** *should be completed, approved, and applied in all future land use decisions within areas affected by operations at **[NAME]** AFB. **[IF APPLICABLE]***

**How can I help?**

Historically, the citizens of **[RELEVANT COUNTIES AND CITIES]** and the personnel of **[NAME]** AFB have worked together in cooperative and harmonious efforts to better serve the needs and desires of all concerned. We have collectively found solutions which have maximized the benefits of **[NAME]** AFB while minimizing annoyances. If the future of **[NAME]** AFB is to be as bright as its past, you, the citizens of **[RELEVANT COUNTIES]**, need to participate in achieving a suitable resolution of our mutual concerns. We request your careful and considered review of the recommendations contained in **[NAME]** AFB's AICUZ report.

**Who prepared the AICUZ Study?**

The AICUZ report was developed by many concerned people at **[NAME]** AFB under supervision of Headquarters United States Air Force and **[PARENT COMMAND]**. The complete report is available at **[NAME]** AFB from the Public Affairs Office, and copies have been placed in local public libraries and are on file with the **[RELEVANT COUNTY]** Recorder. Only the major points of the complete AICUZ report are included in this brochure.