



## DoD INSTRUCTION 4165.57

### AIR INSTALLATIONS COMPATIBLE USE ZONES

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<b>Originating Component:</b>	Office of the Under Secretary of Defense for Acquisition and Sustainment
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<b>Approved by:</b>	Gregory M. Kausner, Performing the Duties of the Under Secretary of Defense for Acquisition and Sustainment

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**Purpose:** In accordance with the authority in DoD Directive (DoDD) 5135.02, this issuance:

- Establishes policy, assigns responsibilities, and prescribes procedures for the DoD Air Installations Compatible Use Zones (AICUZ) program for air installations.
- Establishes policy and assigns responsibilities for educating air installation personnel and engaging local communities on issues related to noise, safety, and compatible land use in and around air installations.

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## SECTION 1: GENERAL ISSUANCE INFORMATION

### 1.1. APPLICABILITY.

This issuance applies to:

- a. OSD, the Military Departments, the Office of the Chairman of the Joint Chiefs of Staff and the Joint Staff, the Combatant Commands, the Office of Inspector General of the Department of Defense, the Defense Agencies, the DoD Field Activities, and all other organizational entities within the DoD (referred to collectively in this issuance as the “DoD Components”).
- b. Air installations of the Military Departments located within the United States.
- c. Air installations of the Military Departments located outside of the United States, but for on-base planning purposes only and subject to the requirements of any applicable international agreement, including any basing agreement.

### 1.2. POLICY.

It is DoD policy to:

- a. Promote the health, safety, and welfare of persons on or near air installations by minimizing aviation noise and safety impacts without degrading air installation safety and mission requirements.
- b. Promote long-term compatible land use on and near air installations by:
  - (1) Encouraging State and local governments to adopt enabling legislation and compatible land use regulations into their land use planning and control processes.
  - (2) Partnering with communities and other eligible entities to protect land through the establishment of restrictive use and conservation easements intended to prevent encroachment on air installations from degrading training, testing, and operations.
- c. Limit acquisition of real property interests to the minimum amount necessary to ensure the operational integrity of the air installation.
- d. Incorporate AICUZ guidelines into on-base land use planning programs.
- e. Integrate AICUZ compatible land use strategies into the test and training range environment for operational noise and safety in accordance with DoDD 3200.15.
- f. Promote education and engagement with communities affected by military operations at air installations. Volume 1 of DoDI 5410.19 provides policy for the conduct of public affairs community relations activities and programs throughout the DoD.

## **SECTION 2: RESPONSIBILITIES**

### **2.1. ASSISTANT SECRETARY OF DEFENSE FOR SUSTAINMENT.**

Under the authority, direction, and control of the Under Secretary of Defense for Acquisition and Sustainment, the Assistant Secretary of Defense for Sustainment provides general oversight and additional guidance and procedures relating to the AICUZ program.

### **2.2. SECRETARIES OF THE MILITARY DEPARTMENTS.**

The Secretaries of the Military Departments:

- a. Develop, implement, and maintain an AICUZ program for each air installation.
- b. Require each air installation to conduct and maintain an AICUZ study.
- c. Develop AICUZ for DoD-controlled joint military-civilian use airfields.
- d. Provide education and training for installation leadership on operational noise and safety, land use compatibility, and community engagement.
- e. Acquire, manage, and dispose of real property interests associated with the AICUZ program in accordance with DoD Instructions (DoDIs) 4165.70, 4165.71, and 4165.72.
- f. Review and approve AICUZ studies and updates for each installation.

## SECTION 3: PROCEDURES

### 3.1. GENERAL.

a. Military Departments and their air installations will engage States, local governments, and communities to foster compatible land use, and to help local governments and communities better understand the nature of military operations and procedures in and around the installation.

b. DoD Components will participate in local comprehensive planning processes, engage the community, and seek effective land use controls to achieve AICUZ compatibility goals.

(1) Numerous land use controls are available to jurisdictions with land use authority including, but not limited to:

- (a) AICUZ overlay zoning ordinances.
- (b) Subdivision regulations.
- (c) Height regulations.

(2) Other strategies to achieve compatibility may include:

- (a) Use of building codes.
- (b) Cluster development techniques.
- (c) Transfer of development rights.
- (d) Real property acquisition.
- (e) Buffer lands and restrictive easement acquisition.
- (f) Disclosure ordinances.

(3) DoD Components should not prescribe an approach. They should instead advocate for local solutions whose outcomes minimize risk to public health, safety, and welfare.

c. Regional and local governments may not always have the authority to enact land use controls to achieve compatibility. In circumstances where incompatible development adversely affects the mission, and regional and local governments lack authority to enact land use controls, acquisition of real property interests may be required to ensure compatibility.

d. Military Departments and their air installations will establish effective working relationships with State, tribal, and local governments, including local planning commissions, special purpose districts, regional and State agencies, airport land-use commissions, and Federal agencies to communicate the objectives of the AICUZ program and operational requirements. This issuance does not impose any requirements on members of the public or State, tribal, or

local governments, nor does it prescribe any specific course of action for these groups to take in dealing with the DoD on land-use questions.

e. DoD Components will maintain compliance with Executive Orders 12898 and 13045.

f. Military Departments will require that each of their air installations:

(1) Address land use compatibility on and in the vicinity of the air installation if:

(a) Operations may affect the public health, safety, or welfare; or

(b) Certain uses or structures may obstruct the airspace, attract birds, create electromagnetic or thermal interference, or produce dust, smoke, steam, or light emissions (including glint or glare) that may impact a pilot's vision, or otherwise be hazardous to or incompatible with aircraft or other military operations. For solar renewable energy projects that require OSD review, approval, or certification in accordance with Sections 2922a or 2662 of Title 10, United States Code (U.S.C.), or the mission compatibility evaluation process in Part 211 of Title 32, Code of Federal Regulations, an approved glare analysis tool should be used to assess hazard and compatibility.

(2) Apply these compatible land use guidelines:

(a) Limit concentrations of people and facilities or structures in areas exposed to a higher risk from aircraft accidents.

(b) Discourage noise-sensitive land uses in areas of higher noise exposure from aircraft operations.

g. At joint bases with airfields that formerly shared a fence-line, the supporting Military Department will be the lead to develop a single AICUZ study that covers all airfields. For joint bases that are geographically separate, the supporting Military Department will be the lead to develop a separate AICUZ study for each airfield.

h. Military Departments will require that their air installations use the land area and height standards defined in the Unified Facilities Criteria (UFC) 3-260-01 for purposes of identifying airspace obstructions and potential land use compatibility issues in accordance with Part 77 of Title 14, Code of Federal Regulations.

### **3.2. AICUZ STUDY CONTENT.**

a. An AICUZ study must include, but not be limited to:

(1) A description of the aircraft noise and aircraft accident potential environment around the air installation generated by existing operations.

(2) A description of any anticipated (i.e., 5- to 15-year) aircraft noise and of operational safety concerns for projected aircraft operations that is consistent with planning timelines used by State, tribal, regional, and local planning bodies if possible.

(3) Recommendations for achieving compatible land use development considering operational noise, accident potential, bird or wildlife aircraft strike hazard, electromagnetic interference, dust, steam, smoke or light emissions, and heights of natural and man-made objects near the air installation that affect flight safety within the surrounding area (see Tables 1 and 2).

(4) Identification of existing and potential incompatible land uses.

(5) Recommendations to achieve compatible development around air installations.

b. Areas of critical concern (as defined in the glossary) beyond the AICUZ footprint may be established by the air installation.

c. For air installations that have significant ground-based noise sources (e.g., explosive ordnance disposal, artillery, or small arms ranges) in addition to an airfield, the AICUZ study will also discuss the sources, operational noise levels, and any management strategies in place to limit ground noise exposure to areas outside the installation.

### **3.3. AIRCRAFT ACCIDENT POTENTIAL.**

a. Areas immediately beyond the ends of runways possess a measurably higher potential for aircraft accidents. For this reason, development should be restricted to certain types of land uses and densities.

b. The goal of land use compatibility within accident potential zones (APZs) is to minimize population density. Appendix 3B provides a detailed land use compatibility matrix for local governments as well as DoD personnel for on-base planning. Table 1 provides land use compatibility recommendations for the clear zones and APZs I and II. The land use compatibility recommendations provided in Table 1 are based on the March 1974 Air Force study. The study was prepared in coordination with the U.S. Army and the Department of the Navy.

c. DoD fixed-wing runways are separated into two types, Class A and Class B, for the purpose of defining aircraft accident potential areas. Specific details on runway types can be found in UFC 3-260-01.

d. The descriptions of standard APZ boundaries in Appendix 3A are guidelines only. Their strict application would increase the safety of the public but would not provide complete protection against the effects of aircraft accidents. Where it is desirable to restrict the density of development of an area, it is not usually possible to state that one density is safe and another is not. Air installations should work to create the greatest degree of safety they can reasonably attain. Local situations may differ significantly from the assumptions and data upon which these guidelines are based and may require individual study.

e. At joint bases where the Military Departments' criteria for APZs and clear zones differ, the base will use the criteria of the Military Service operating the airfield unless that Service agrees to use the supporting Military Service's criteria. The agreement between the operating and supporting Military Service should consider which APZ criteria offers greater safety.

### **3.4. APZS AND CLEAR ZONES FOR FIXED-WING AIRCRAFT.**

a. A clear zone is required at the ends of all active DoD runways. UFC 3-260-01 details the dimensions for APZs and clear zones for fixed-wing runways. Note that shapes and dimensions are Department-specific. See Appendix 3A for APZ guidelines.

b. APZs may be modified:

(1) If multiple flight tracks exist and significant numbers of aircraft operations are on multiple flight tracks, the Military Department may make modifications to create APZs that conform to the multiple flight tracks.

(2) If most aircraft do not overfly the APZs, the Military Department may make modifications to alter the straight APZs shown in Appendix 3A and adjust them to conform to the actual lines of flight.

(3) If other unusual conditions exist, the Military Department may make modifications to alter safety zones as necessary.

### **3.5. APZS AND CLEAR ZONES FOR ROTARY-WING, SHORT TAKE-OFF AND VERTICAL LANDING AIRCRAFT.**

a. A clear zone and APZ are required for rotary-wing runways, helipads, landing lanes, and hoverpoints.

b. The long axis of clear zones for rotary-wing runways and helipads for visual and standard instrument flight rules operations is 400 feet (width can vary). The clear zone length for Army and Air Force instrumented flight rules for same direction ingress and egress is 825 feet.

c. The long axis of APZs for rotary-wing runways and helipads is 800 feet.

d. UFC 3-260-01 provides further details for the dimensions for rotary-wing runways and helipads, APZs, and clear zones.

### **3.6. AIRCRAFT NOISE.**

#### **a. General.**

(1) Long-term land use compatibility with noise resulting from the operation of military aircraft should minimize the effects on people, animals (domestic and wild), and structures on or near air installations.



(2) Land use compatibility determinations concerning aircraft noise will be derived from the Federal Interagency Committee on Urban Noise “Guidelines for Considering Noise in Land Use Planning and Control” as endorsed by the Federal Interagency Committee on Noise in the “Federal Agency Review of Selected Airport Noise Analysis Issues.”

(a) Air installation personnel will use the detailed land use compatibility matrix for aircraft noise provided in Appendix 3C for on-base planning, and will engage with local governments to foster compatible land use development when possible.

(b) Table 2 provides land use compatibility recommendations based on standard land use coding manual (SLUCM) codes and the A-weighted day-night average sound level (DNL) or community noise equivalent level (CNEL) noise areas on and around air installations.

(3) DoD Component personnel will use the DNL noise descriptor to describe the aircraft noise environment around air installations, except in California, where the CNEL descriptor will be used to describe the aircraft noise environment. If laws require some other aircraft noise descriptor, it may be used in addition to DNL. Supplemental noise metrics may also be used to augment the DNL or CNEL analysis as noted by the Federal Interagency Committee on Noise Guidelines. Because land use compatibility guidelines are based on annual average noise levels, aircraft noise contours should be developed by the air installation based on average annual day operations.

#### **b. Reducing Noise Impacts.**

The air installation will take reasonable, economical, and practical measures to reduce and control aircraft noise from flying and flying-related activities. Typical measures include siting engine test and run-up facilities in remote areas when practical, use of sound suppression equipment, and adjustment of aircraft flight paths to avoid noise sensitive areas if the installation can accomplish such adjustments safely and without significant impairment of operational effectiveness.

#### **c. Plotting Aircraft Noise Contours.**

(1) At a minimum, contours for DNL 65, 70, 75, 80, and 85 dB will be plotted on maps for air installations as part of AICUZ studies. In California, where CNEL is used, AICUZ noise footprints will include a 60 dB CNEL contour. The Department of the Army will apply Installation Compatible Use Zone program DNL designations of 60 through 65, 65 through 75, and greater than 75 dB at its air installations. Contours below 65 dB DNL (or 60 dB CNEL in California) are not required at Department of Navy and Department of the Air Force air installations but the Military Department may provide them if local conditions warrant discussion of lower aircraft noise levels, such as in rural and desert areas, other venues associated with low ambient noise levels, or if significant noise complaints have been received from areas outside 65 dB DNL contours.

(2) DoD Component personnel will use guidance and noise assessment and management techniques from the DoD Operational Noise Program in accordance with DoDI 4715.13 to support the AICUZ program.

### **3.7. AICUZ UPDATES.**

a. Land use planning involves the formulation of long-range strategies intended to influence present and future uses of lands. Frequent AICUZ updates and changes in land use recommendations can undermine the neighboring community's willingness to incorporate DoD's land use recommendations into local comprehensive plans or to enact land use controls.

b. AICUZ study recommendations should be based on best available, realistic, long-range projections of installation operations in support of local, state, and regional government land use planning objectives.

c. However, AICUZ updates should be undertaken when an air installation undertakes major mission changes, including, for example, increases in nighttime operations (for operations between 10:00 p.m. and 7:00 a.m.), basing of significant numbers of additional or a new type of weapon system, or base realignment affecting operations.

### **3.8. ACQUISITION OF INTERESTS IN LANDS.**

a. When local land use regulations do not provide sufficient protection for military operations (e.g., preventing incompatible development or airspace obstructions), the Military Department will consider the acquisition of real property interests sufficient to protect the installation from encroachment.

(1) Ownership in fee or of an appropriate restrictive use easement within the clear zone at air installations is preferred, unless State and local government development regulations will clearly have long-term effectiveness or acquisition is not practicable. Air installations should develop a strategy for clear zone acquisition or control in concert with the host community.

(2) The acquisition of restrictive use easements or interests in land outside the clear zone, such as APZs and noise zones, should be pursued only when State and local governments are unwilling or unable to enact land use controls to achieve land use compatibility in accordance with AICUZ guidelines; the operational integrity of the air installation is clearly threatened; and all other measures to achieve land use compatibility are exhausted.

b. Acquisition of real property interests will be in accordance with DoDD 4165.06 and DoDI 4165.70. Acquisition of real property interests from willing sellers pursuant to agreements with non-Federal governmental agencies and non-governmental organizations, pursuant to Section 2684a of Title 10, U.S.C., can be an effective means of preserving compatible land uses.

c. For acquisition of real property interests, in accordance with Paragraph 1.2.c., these types of rights should be considered, as appropriate:

(1) To prohibit or limit the release into the air of any substance that would impair the visibility or otherwise interfere with the operations of aircraft, including, but not limited to, steam, dust, and smoke.

(2) To prohibit or limit light emissions, either direct or indirect (i.e., reflective), visible or invisible, including lasers, that might interfere with pilot vision or performance of instruments, equipment, and weapons systems.

(3) To prohibit electromagnetic emissions that would interfere with aircrew, aircraft, aircraft sensors, aircraft communications systems, or aircraft navigational equipment.

(4) To prohibit any use of the land that would unnecessarily attract birds, including, but not limited to, operation of sanitary landfills, maintenance of feeding stations, or growing of certain types of vegetation attractive to birds.

(5) To prohibit and remove any buildings or other non-frangible structures.

(6) To top, cut to ground level, and to remove trees, shrubs, brush, or other forms of obstructions the Military Department determines might interfere with the operation of aircraft, including emergency landings.

(7) To allow for ingress and egress upon, over, and across the land for exercising the rights acquired or retained.

(8) To post signs on the land indicating the nature and extent of the government's control over it.

(9) To prohibit land uses other than:

(a) Agriculture (except such uses that would attract birds).

(b) Livestock grazing (except managed intensive grazing, concentrated animal feeding operations, feedlots, dairy herds, and intensive animal husbandry).

(c) Permanent open space (open space recreational use will conform to the compatibility guidelines in Appendix 3B).

(d) Existing water areas.

(e) Rights-of-way for fenced highways, without sidewalks or bicycle trails.

(f) Rights-of-way for railroads without terminals or platforms, so long as rail traffic does not extend into the flight path.

(g) Communications and utility rights-of-way, provided all facilities are at or below grade.

(10) To prohibit entry of persons onto the land except in connection with activities authorized.

(11) To control the height of structures to ensure they do not become a hazard to flight.

(12) To install airfield lighting and navigational aids.

d. When disposal of non-DoD Federal property at or in the vicinity of an air installation will impact its mission, the Military Department exercising real property accountability for the air installation will seek to have the disposal agency retain compatible land use easements over the property to be disposed of for the benefit of the air installation.

### **3.9. COMPATIBLE USE STUDIES.**

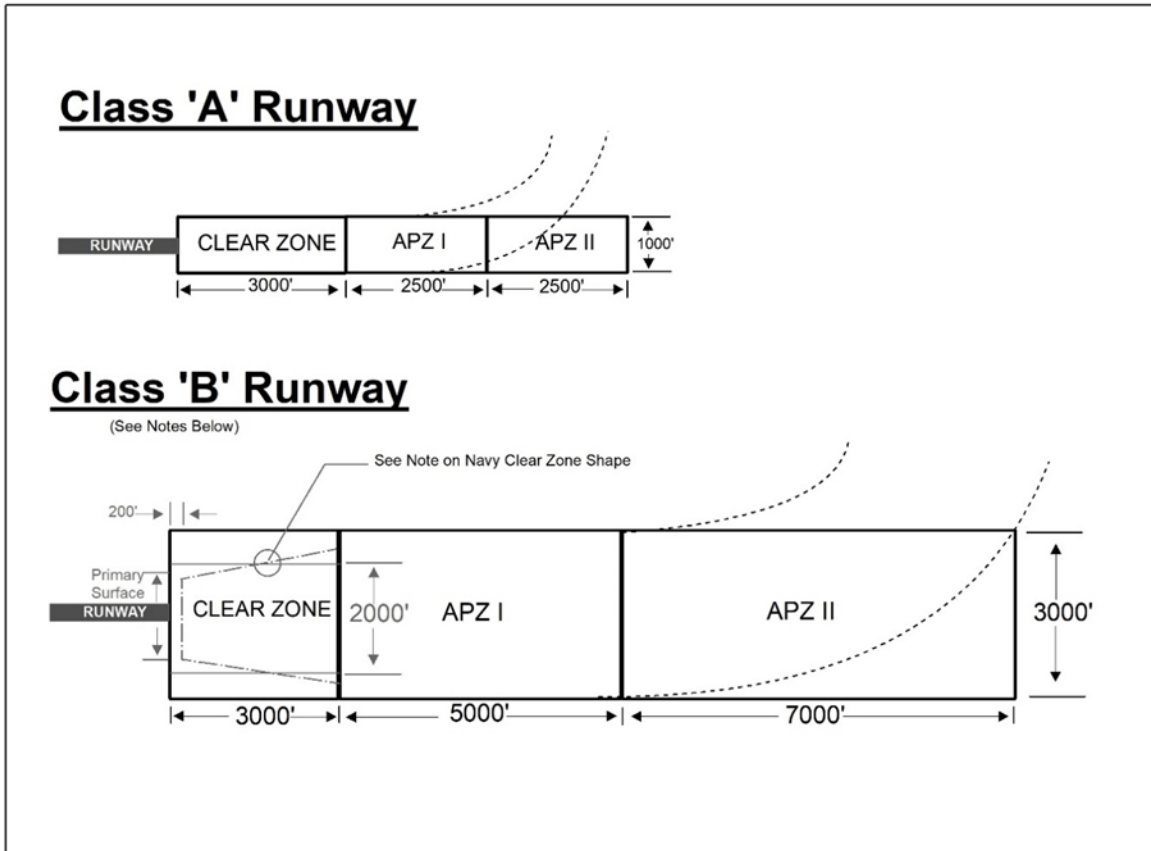
a. The Office of Local Defense Community Cooperation administers the Compatible Use Program pursuant to Section 2391(b)(1) of Title 10, U.S.C. and in accordance with DoDD 3030.01 and DoDI 3030.03, to promote consistent ongoing compatible use and outreach programs between installations and local communities.

b. Each time an AICUZ is updated, the DoD Components will consider whether further engagement with the neighboring local communities is needed through a Compatible Use Study to preserve the operational utility of the air installation. The results of previous collaborative planning efforts are important factors in the determination and drive goals development. However, each installation will consider if it has appropriate protection through its AICUZ before applying for any future Compatible Use Studies.

## APPENDIX 3A: APZ GUIDELINES

3A.1. Figure 1 depicts guidelines for runway APZs and clear zones.

Figure 1. Runway APZs and Clear Zones



3A.2. Class B runway clear zones are rectangular in shape, with the width of 1,000 feet for Department of Army airfields and 3,000 feet for Department of Air Force airfields. Class B runway clear zones for Department of Navy airfields are trapezoidal in shape following the established approach and departure surface, and width of the primary surface for existing runways and new runway construction.

3A.3. Depictions of APZs in Figure 1 are a nominal representation. Flight tracks may depart the runway centerline before the end of the clear zone. APZs for Class A or Class B runways can follow major flight paths including curved flight paths based on Military Department analysis.

3A.4. The APZ I and APZ II width for a Class B runway at Department of Air Force and Department of Navy airfields are 3,000 feet and is 1,000 feet for a Class B runway at Department of Army airfields.

## APPENDIX 3B: RECOMMENDED LAND USE COMPATIBILITY IN APZS

3B.1. Table 1 provides compatibility recommendations based on historic aircraft mishap locations on or near air installations. The primary land use objective is to discourage land uses involving substantial human presence in areas of high accident potential.

3B.2. While Table 1 uses SLUCM categories for organization, it varies from SLUCM as the coding system does not differentiate based on population density. Some uses warrant additional evaluation due to variations in intermittent concentrations of people (e.g. crowds at a sporting event), intensity of use, or other characteristics that could impact safety of flight. Table 1 includes floor area ratio (FAR) recommendations to guide suggested maximum density for non-residential uses. General notes and specific footnotes at the bottom of Table 1 provide additional information and compatibility considerations.

3B.3. These recommendations are intended to support compatible land use planning both on and off base; they do not constitute a Federal determination that any use of land is acceptable or unacceptable under local zoning.

**Table 1. Land Use Compatibility in APZs**

Land use Name and SLUCM Category	Clear Zone	APZ-I	APZ-II	Maximum Density
<b>Residential use group (SLUCM Category 10)</b>				
Residential uses, inclusive of all residential units i.e., any type of single or multiple dwelling units	N	N	Y <sup>1,2</sup>	Maximum density of 2 dwelling units per acre
Mobile home parks or courts	N	N	N	
Transient lodgings	N	N	N	
<b>Manufacturing use group (SLUCM Categories 20 and 30)</b>				
Food and kindred products; textile mill products; manufacturing; stone, clay, glass, primary metal and fabricated metal products; manufacturing	N	N	Y	Max FAR 0.56 in APZ II
Fabric products; leather and similar materials; chemicals and allied products; petroleum refining and related industries; rubber and miscellaneous plastic products; manufacturing; precision manufacturing	N	N	N	
Lumber and wood products; manufacturing furniture and fixtures; paper and allied products; printing, publishing, and allied industries; miscellaneous manufacturing	N	Y	Y	Maximum FAR of 0.28 in APZ I and 0.56 in APZ II
<b>Transportation, communication, and utilities use group (SLUCM Category 40)</b>				
Rail, motor vehicle, aircraft, marine etc. transportation, highway and street right-of-way, automobile parking, and utilities, telephone, cellular and radio communication	N <sup>3</sup>	Y <sup>4</sup>	Y	Maximum FAR of 0.28 in APZ I and 0.56 in APZ II
Solid waste disposal (e.g., landfills, incinerators.)	N	N	N	

**Table 1. Land Use Compatibility in APZs, Continued**

Land use Name and SLUCM Category	Clear Zone	APZ-I	APZ-II	Maximum Density
<b>Trade use group (SLUCM Category 50)</b>				
Wholesale trade	N	Y	Y	Maximum FAR of 0.28 in APZ I and .56 in APZ II
Retail trade – building materials	N	Y	Y	Maximum FAR of 0.20 in APZ-I and 0.40 in APZ-II
Retail trade – hardware, paint, and farm equipment stores	N	Y	Y	Maximum FAR of 0.14 in APZ I and 0.28 in APZ II
Retail trade – including neighborhood centric shops	N	N	Y	Maximum FAR of 0.16 in APZ II
Mass retailing, super stores, strip malls, shopping centers <sup>5</sup> , discount clubs, home improvement stores, eating and drinking establishments, etc.	N	N	N	
Retail trade – food such as groceries, bakeries, confectionaries, meat markets, and fast food establishments	N	N	Y	Maximum FAR of 0.24 in APZ II
Retail trade – automotive, marine craft, aircraft, and accessories	N	Y	Y	Maximum FAR of 0.14 in APZ I and 0.28 in APZ II
Retail trade – apparel and accessories, furniture, home, furnishings and equipment	N	N	Y	Maximum FAR of 0.28 in APZ II
Other retail trade	N	N	Y	Maximum FAR of 0.16 in APZ II
<b>Services use group (SLUCM Category 60)</b>				
Finance, insurance, real estate, personal, professional and miscellaneous services (office uses only)	N	N	Y	Maximum FAR of 0.22 in APZ II
Cemeteries	N	Y <sup>6</sup>	Y <sup>6</sup>	
Warehousing and storage services	N	Y	Y	Maximum FAR of 1.0 in APZ I; 2.0 in APZ II
Repair services and contract construction	N	Y	Y	Maximum FAR of 0.11 APZ I; 0.22 in APZ II
Hospitals, nursing homes, and other medical facilities; educational services, childcare services, child development centers, and nurseries	N	N	N	
Government services	N	N	Y	Maximum FAR of 0.24 in APZ II
<b>Cultural, entertainment, and recreational use group (SLUCM Category 70)</b>				
Nature exhibits	N	Y <sup>7</sup>	Y <sup>7</sup>	
Cultural activities, auditoriums, concert halls, places of worship; outdoor music shells, museums, outdoor displays, amphitheaters, sports arenas, spectator sports, resorts and group camps, or other places of assembly	N	N	N	
Amusements (e.g., fairgrounds, miniature golf, driving ranges; amusement parks.)	N	N	Y <sup>11</sup>	50 people per acre
Recreational activities (including golf courses, riding stables, water recreation), parks	N	Y <sup>7</sup>	Y <sup>7</sup>	Maximum FAR of 0.11 in APZ I; 0.22 in APZ II

**Table 1. Land Use Compatibility in APZs, Continued**

Land use Name and SLUCM Category	Clear Zone	APZ-I	APZ-II	Maximum Density
Other cultural, entertainment and recreation	N	Y <sup>6</sup>	Y <sup>6</sup>	
<b>Resource production and extraction use group (SLUCM Category 80)</b>				
Agriculture and livestock farming, including grazing and feedlots	Y <sup>8</sup>	Y <sup>8</sup>	Y <sup>8</sup>	
Agriculture related activities	N	Y	Y	Maximum FAR of 0.28 in APZ I; 0.56 in APZ II
Forestry activities <sup>9</sup>	N	Y	Y	Maximum FAR of 0.28 in APZ I; 0.56 in APZ II
Fishing activities	N <sup>10</sup>	Y	Y	Maximum FAR of 0.28 in APZ I; 0.56 in APZ II
Mining activities	N	Y	Y	Maximum FAR of 0.28 in APZ I; 0.56 in APZ II
Other resource production or extraction	N	Y	Y	Maximum FAR of 0.28 in APZ I; 0.56 in APZ II
<b>Other use group (SLUCM Category 90)</b>				
Undeveloped land	Y	Y	Y	
Water areas	N	N	N	
<p><b>Key to Table 1 – Land use compatibility in APZs</b></p> <p>Land use recommendations:</p> <p>Y (Yes) – Land use and related structures compatible without restrictions.</p> <p>N (No) – Land use and related structures are not compatible and should be prohibited.</p> <p>Y<sup>X</sup> – Yes with restrictions. The land use and related structures generally are compatible. However, see note(s) indicated by the superscript.</p> <p>N<sup>X</sup> – No with exceptions. The land use and related structures are generally incompatible. However, see note(s) indicated by the superscript.</p>				
<p><b>Notes for Table 1 – Land Use Compatibility in APZs</b></p> <p>General notes for all uses:</p> <ol style="list-style-type: none"> <li>The suggested maximum occupancy for commercial, service, or industrial buildings or structures in APZ I is 25 people per acre, and 50 people per acre in APZ II. Outside events should normally be limited to assemblies of not more than 25 people an acre in APZ I, and maximum assemblies of 50 people an acre in APZ II.</li> <li>Recommended FARs are calculated using standard parking generation rates for various land uses, vehicle occupancy rates, and desired density in APZ I or II. For APZ I, the formula is FAR equals 25 people an acre divided by (Average vehicle occupancy times Average parking rate times (43560÷1000)). The formula for APZ II is FAR equals 50 divided by (Average vehicle occupancy times Average parking rate times (43560÷1000)).</li> <li>No structures (except airfield lighting and navigational aids necessary for the safe operation of the airfield when there are no other siting options), buildings, or above ground utility and communications lines should normally be located in clear zone areas on or off the air installation. For pilot and public safety, the clear zone is subject to the most severe restrictions.</li> <li>Safety of flight should be considered when evaluating development that includes explosive potential; generates smoke, steam, or dust; creates electronic interference; lighting or glare; or tall structures.</li> <li>Development of renewable energy resources, including solar and geothermal facilities and wind turbines, may impact military operations through hazards to flight or electromagnetic interference. Each new development should be analyzed for compatibility on a case-by-case basis that considers both the proposal and potentially affected mission.</li> </ol>				



**Table 1. Land Use Compatibility in APZs, Continued**

<p>Notes for Table 1 – Land Use Compatibility in APZs, Continued</p> <p>f. Water features and other activities that may present bird or wildlife aircraft strike hazards, or activities that produce dust or light emissions that could affect pilot vision are generally not compatible and should be evaluated on a case-by-case basis.</p> <p>g. Evaluation of potential land management actions occurring on public and private lands, such as prescribed burns, should identify the hazard (e.g., visual impairment) to aircraft flight safety and de-conflict operations occurring at the base (e.g., scheduled exercises and training requirements).</p> <p>h. This compatibility table identifies places of worship or tribal ceremonies as a cultural gathering. However, religious institutions provide a wide variety of services and in these instances refer to the applicable category.</p>
<p>Footnotes for Table 1 – Land Use Compatibility in APZs</p> <p>Footnotes specific to certain land uses:</p> <ol style="list-style-type: none"> <li>1. The suggested maximum density for detached single-family housing is two dwelling units per acre to encourage retention of farming and open space.</li> <li>2. Where a parcel is partially located in an APZ II, clustered development is encouraged on the portion outside the APZ while maximizing open space within the APZ.</li> <li>3. All roads within the clear zone are discouraged, but if required, they should not be wider than two lanes and the rights-of-way should be fenced (i.e., frangible) and not include sidewalks or bicycle trails. Nothing associated with these roads should violate obstacle clearance criteria.</li> <li>4. Above ground passenger terminals and above ground power transmission or distribution lines are not recommended. Prohibited power lines include high-voltage transmission lines and distribution lines that provide power to cities, towns, or regional power for unincorporated areas.</li> <li>5. A shopping center is an integrated group of commercial establishments that is a planned, developed, owned, or managed as a unit. Shopping center types include strip, neighborhood, community, regional, and super-regional facilities anchored by small businesses, a supermarket or drug store, discount retailer, department store, or several department stores, respectively. The maximum recommended FAR should be applied to the gross leasable area of the shopping center.</li> <li>6. Land uses in the APZs should be passive open space; ancillary places of public assembly are not recommended.</li> <li>7. Low occupancy facilities are compatible with these uses; however, playgrounds and marinas are not recommended.</li> <li>8. Activities that attract concentrations of birds creating a hazard to aircraft operations are not compatible.</li> <li>9. Lumber and timber products removed due to establishment, expansion, or maintenance of clear zone lands owned in fee will be disposed of in accordance with applicable DoD guidance.</li> <li>10. Controlled hunting and fishing may occur for the purpose of wildlife management.</li> <li>11. Amusement centers, family entertainment centers or amusement parks designed or operated at a scale that could attract or result in concentrations of people, including employees and visitors, greater than 50 people per acre at any given time are incompatible in APZ II. Measures that reduce noise at a site should be used wherever practical in preference to measures that only protect interior spaces.</li> <li>12. “Eating and drinking establishments” are distinguished from retail trade or fast food based on the predominant purpose of the restaurant to provide food and beverage to persons seated on premises. This includes cafes, tea rooms, and outdoor cafes that involve low customer turnover and greater numbers of people dining on-site. Restaurants with drive-through service that offer quick, “fast-food” service, often accomplished by a limited menu of already prepared items and that have typically high customer turnover and lower numbers of customers dining on-site fall within the retail trade or fast food category.</li> </ol>

## APPENDIX 3C: RECOMMENDED LAND USE COMPATIBILITY IN AIRCRAFT NOISE ZONES

3C.1. Table 2 provides compatibility recommendations based on yearly DNL or CNEL on and around air installations. The primary land use objective is to discourage noise-sensitive land uses in areas of higher noise exposure.

3C.2. Table 2 is organized based on SLUCM categories; however, it varies from SLUCM as the coding system does not differentiate based on noise-sensitivity. Some uses warrant additional evaluation due to potential for annoyance and activity interference. General notes and specific footnotes at the bottom of Table 2 provide additional information and considerations for compatibility determinations.

3C.3. These recommendations are intended to support compatible land use planning both on- and off-base; they do not constitute a Federal determination that any use of land is acceptable or unacceptable in accordance with local zoning.

**Table 2. Land Use Compatibility in Aircraft Noise Zones**

Land use Name and SLUCM Category	A-weighted DNL/CNEL levels					
	<65 decibel (dB)	65-70 dB	70-75 dB	75-80 dB	80-85 dB	85 dB
<b>Residential use group (SLUCM Category 10)</b>						
Residential uses, inclusive of all residential units (i.e. any type of single or multiple dwelling units).	Y	N <sup>1</sup>	N <sup>1</sup>	N	N	N
Mobile home parks or courts	Y	N	N	N	N	N
Transient lodgings	Y	N <sup>1</sup>	N <sup>1</sup>	N <sup>1</sup>	N	N
<b>Manufacturing use group (SLUCM Categories 20 and 30)</b>						
Manufacturing and industrial uses	Y	Y	Y <sup>2</sup>	Y <sup>3</sup>	Y <sup>4</sup>	N
Precision manufacturing	Y	Y	Y <sup>2</sup>	Y <sup>3</sup>	N	N
<b>Transportation, communication and utilities use group (SLUCM Category 40)</b>						
Rail, motor vehicle, aircraft, marine, and other transportation, and communication systems and utilities	Y	Y	Y <sup>2</sup>	Y <sup>3</sup>	Y <sup>4</sup>	N
Highway and street right-of-way, automobile parking	Y	Y	Y	Y	Y	N
Telephone, cellular and radio communication	Y	Y	Y <sup>2</sup>	Y <sup>3</sup>	N	N
<b>Trade use group (SLUCM Category 50)</b>						
Wholesale trade	Y	Y	Y <sup>2</sup>	Y <sup>3</sup>	Y <sup>4</sup>	N
Building materials, hardware and farm equipment sales	Y	Y	Y <sup>2</sup>	Y <sup>3</sup>	Y <sup>4</sup>	N
Mass retailing, super stores, strip malls, shopping centers, discount clubs, home improvement stores, eating and drinking establishments, etc.	Y	Y	Y <sup>2</sup>	Y <sup>3</sup>	N	N

**Table 2. Land Use Compatibility in Aircraft Noise Zones, Continued**

Land use name and SLUCM Category	A-weighted DNL/CNEL levels					
	<65 dB	65-70 dB	70-75 dB	75-80 dB	80-85 dB	85 dB
<b>Services use group (SLUCM Category 60)</b>						
Finance, insurance and real estate, personal, professional and miscellaneous services; religious activities	Y	Y	Y <sup>2</sup>	Y <sup>3</sup>	N	N
Cemeteries	Y	Y	Y <sup>2</sup>	Y <sup>3</sup>	Y <sup>4</sup>	Y <sup>5</sup>
Warehousing or storage and repair services	Y	Y	Y <sup>2</sup>	Y <sup>3</sup>	Y <sup>4</sup>	N
Hospitals or medical, child care and development services, educational facilities	Y	Y <sup>2</sup>	Y <sup>3</sup>	N	N	N
Nursing homes	Y	N <sup>1</sup>	N <sup>1</sup>	N	N	N
Governmental	Y	Y	Y <sup>2</sup>	Y <sup>3</sup>	N	N
<b>Cultural, entertainment, and recreational use group (SLUCM Category 70)</b>						
Cultural activities, auditoriums and concert halls	Y	Y <sup>2</sup>	Y <sup>3</sup>	N	N	N
Nature exhibits	Y	Y	N	N	N	N
Public assembly	Y	Y	N	N	N	N
Outdoor music shells, amphitheaters	Y	N	N	N	N	N
Outdoor sports arenas, spectator sports	Y	Y <sup>6</sup>	Y <sup>6</sup>	N	N	N
Amusements	Y	Y	Y	N	N	N
Outdoor recreational activities	Y	Y	Y <sup>2</sup>	Y <sup>3</sup>	N	N
Resorts, camps, parks and other cultural, entertainment, and recreational activities	Y	Y	Y <sup>2</sup>	N	N	N
<b>Resource production and extraction use group (SLUCM Category 80)</b>						
Agriculture and forestry	Y	Y <sup>7</sup>	Y <sup>8</sup>	Y <sup>9</sup>	Y <sup>9</sup>	Y <sup>9</sup>
Livestock farming, animal breeding	Y	Y <sup>7</sup>	Y <sup>8</sup>	N	N	N
Fishing, mining, and other resource production or extraction	Y	Y	Y	Y	Y	Y
Key to Table 2 – Land use compatibility in aircraft noise zones						
Land use recommendations						
Y (Yes) – Land use and related structures compatible without restrictions.						
N (No) – Land use and related structures are not compatible and should be prohibited.						
Y <sup>x</sup> – Yes with restrictions. The land use and related structures generally are compatible. However, see note(s) indicated by the superscript.						
N <sup>x</sup> – No with exceptions. The land use and related structures are generally incompatible. However, see note(s) indicated by the superscript.						
Notes for Table 2 – Land use compatibility in aircraft noise zones						
General notes for all uses:						
a. Compatibility designations in Table 2 generally refer to the principal use of the site. If other uses with greater sensitivity to noise are proposed, a determination of compatibility should be based on that use which is most adversely affected by noise and its contribution to the successful use of the property.						
b. Where a proposed development falls within two DNL or CNEL noise zones, the land use recommendations of the higher noise zone should be used. For example, if a proposed development is exposed to 70 dB DNL or CNEL, land use recommendations for the 70-75 dB DNL or CNEL noise zone should be applied.						

**Table 2. Land Use Compatibility in Aircraft Noise Zones, Continued****Notes for Table 2 – Land Use Compatibility in Aircraft Noise Zones, Continued**

- c. When appropriate, noise level reduction (NLR) may be necessary to achieve compatibility. NLR (outdoor to indoor) is achieved through the incorporation of sound attenuation into the design and construction of a structure. Measures to achieve an indoor noise reduction do not necessarily solve noise issues outside the structure and additional evaluation may be warranted. Building location, site planning, design, and use of berms and barriers can help mitigate outdoor noise exposure, particularly from aircraft ground maintenance run-ups. Measures that reduce noise at a site should be used wherever practical in preference to measures that only protect interior spaces.
- d. All land uses are generally compatible with noise below 65dB DNL. However, localities, when evaluating the application of these guidelines, should consider possible annoyance tied to land uses that involve predominately outdoor activities, or where quiet is a basis for the use.
- e. Land uses that involve outdoor activities in areas above 80dB DNL are not recommended.

**Footnotes for Table 2 – Land Use Compatibility in Aircraft Noise Zones**

Footnotes specific to certain land uses:

1. Residential

- a. Although local conditions regarding the need for housing may require residential use in these zones, residential use is discouraged in DNL 65-70 and strongly discouraged above DNL 70. The absence of viable alternative development options should be determined, and an evaluation should be conducted locally prior to local approvals. These evaluations should clearly demonstrate that the community's need for additional residential property could not be met if development were prohibited in these zones, and that the expense of additional noise attenuation will not undermine affordable housing goals.
- b. Where the community determines that these uses must be allowed, measures to achieve outdoor to indoor NLR of at least 25 dB in DNL 65-70 and 30 dB in DNL 70-75 should be incorporated into building codes, and be considered in individual approvals; for transient housing, an NLR of at least 35 dB should be incorporated in DNL 75-80.
- c. Normal permanent construction can be expected to provide a NLR of 20 dB, thus the reduction requirements are often stated as 5, 10, or 15 dB over standard construction and normally assume mechanical ventilation, upgraded sound transmission class ratings in windows and doors, and closed windows year-round. Additional consideration should be given to modifying NLR levels based on peak noise levels (as defined in the glossary) or vibrations.
2. Measures to achieve NLR of 25 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.
3. Measures to achieve NLR of 30 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.
4. Measures to achieve NLR of 35 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.
5. Buildings where public is received, are not recommended.
6. Land use is compatible provided special sound reinforcement systems are installed.
7. Where residences are permitted, measures to achieve outdoor to indoor NLR of at least 25 dB should be incorporated into the design.
8. Where residences are permitted, measures to achieve outdoor to indoor NLR of at least 30 dB should be incorporated into the design.
9. Residences are not compatible.

## GLOSSARY

### G.1. ACRONYMS.

<b>ACRONYM</b>	<b>MEANING</b>
AICUZ	air installations compatible use zones
APZ	accident potential zone
CNEL	community noise equivalent level
dB	decibel
DNL	day-night average sound level
DoDD	DoD directive
DoDI	DoD instruction
FAR	floor area ratio
NLR	noise level reduction
SLUCM	standard land use coding manual
UFC	unified facilities criteria
U.S.C.	United States Code

### G.2. DEFINITIONS.

Unless otherwise noted, these terms and their definitions are for the purpose of this issuance.

<b>TERM</b>	<b>DEFINITION</b>
<b>A-weighted</b>	An expression of the relative loudness of sounds in the air as perceived by the human ear where the dB values of sound at low frequencies are reduced. By contrast, unweighted dBs make no correction for audio frequency.
<b>airfield</b>	Defined in the DoD Dictionary of Military and Associated Terms.
<b>air installation</b>	Installations whose mission include the operation of fixed-wing or rotary-wing military airfields.
<b>APZ I</b>	The area beyond the clear zone that possesses a significant potential for accidents. This area has the second highest potential for aircraft mishaps (see Figure 1).

<b>TERM</b>	<b>DEFINITION</b>
<b>APZ II</b>	The area beyond the APZ I having a measurable potential for accidents. This area has the third highest potential for aircraft mishaps (see Figure 1).
<b>area of critical concern</b>	An area within the airfield environment as defined by the Military Department where land use controls may be desirable to protect long-term mission capability. The development of the final boundary of areas of critical concern will also take into account natural and manmade features.
<b>Class A runway</b>	A runway primarily intended for small, light aircraft that does not have the potential for development of heavy or high-performance aircraft use, or for which no foreseeable requirements for such use exists. Ordinarily, less than 10 percent of the operations at airfields with Class A runways involve aircraft in the Class B category and the runway(s) are less than 8,000 feet (see Figure 1).
<b>Class B runway</b>	A runway primarily intended for high-performance and large, heavy aircraft. For example, runways that accommodate heavy aircraft or have the potential for development for heavy aircraft use (see Figure 1).
<b>clear zone</b>	A surface on the ground or water beginning at the runway end and symmetrical about the runway centerline extended. This area has the highest potential for aircraft mishaps (see Figure 1).
<b>peak</b>	A single-event sound level without weighting.
<b>United States</b>	The States, the District of Columbia, the Commonwealths of Puerto Rico and the Northern Mariana Islands, American Samoa, Guam, Midway and Wake Islands, the United States Virgin Islands, and any territory or possession of the United States, and associated navigable waters, contiguous zones, and ocean waters of which the natural resource are under the exclusive management authority of the United States.

## REFERENCES

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