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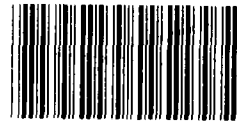
REPORT BY THE U.S.

# General Accounting Office

8AA/6

## DOD's Commendable Initial Efforts To Solve Land Use Problems Around Airfields

The Department of Defense has a timely, forward-looking program for achieving compatible land uses around military airfields. The program could be more mutually beneficial to the communities and the Department by revising and reissuing the airfield studies where operational changes have occurred to identify more accurate and current noise zones. The Secretary of Defense should review the plans and practices of the Navy and the Air Force to assure that they are consistent with Defense policy.



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report

LCD-78-341  
JANUARY 22, 1979



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*AGC00001 DON  
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The Honorable Harold Brown  
The Secretary of Defense *AGC00005*

This report describes how the military services encourage compatible land use around airfields through the air installation compatible use zones program. We made the review to evaluate the effectiveness of the program. A previous report (LCD-76-329, May 21, 1976) discussed the program's policies and scope.

Our report contains recommendations to you on pages 17 and 28. As you know, section 236 of the Legislative Reorganization Act of 1970 requires the head of a Federal agency to submit a written statement on actions taken on our recommendations to the House Committee on Government Operations and the Senate Committee on Governmental Affairs not later than 60 days after the date of the report and to the House and Senate Committees on Appropriations with the agency's first request for appropriations made more than 60 days after the date of the report.

We are sending copies of this report to the Chairmen of the House Committee on Government Operations, the Senate Committee on Governmental Affairs, the House and Senate Committees on Appropriations, the House and Senate Committees on Armed Services, the House Committee on Public Works and Transportation, and the Senate Committee on Environment and Public Works. We are also sending copies of the report to the Director of the Office of Management and Budget; and the Secretaries of the Army, the Navy, and the Air Force.

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Sincerely yours,



R. W. Gutmann  
Director





D I G E S T

Accident potential and noise from flight operations at about 200 military air bases in the United States affect millions of people and thousands of acres of private property. Controlled land development of the surrounding area is necessary to assure flight safety and to protect the public. The Department of Defense's compatible use zones program, begun in 1973, is a commendable first step in achieving the necessary compatible development. However, for the program to be more effective, establishing accurate and credible accident and noise contours is essential. Effectiveness of local government controls such as land use plans, zoning laws, and noise insulation codes is influenced by the local communities' economic dependence on the airfield's presence and the pressure for residential, commercial, and industrial development of surrounding private lands.

The air installation compatible use zones program was timely and forward-looking in fostering land use planning to protect the public and continue flight operations essential for national defense. The air installations' studies are providing useful information for local governments to plan compatible land uses and for the Government to act on pending incompatible development. (See pp. 5 to 17.)

Defense's compatible use zones program has foresight and is essential for achieving compatible land use around military airfields. The bases' efforts in cooperating with communities, reporting on the need for compatible land use, and making operational changes have, in most cases, been successful

in lessening the impact of flight activities on base environs and in furthering community and base land use needs.

The approaches of both the Navy and the Air Force to acquiring property interests are sound in principle. In view of the generally lower land values around Air Force bases, acquisition of clear zone land rights, particularly when restrictive easements can be acquired, appears to be relatively inexpensive insurance for long range protection.

The Navy's greater reliance on local government control of land use, within as well as outside the clear zone, also has merit, although there seem to be some inconsistencies in application of the policy. There may also be some problems for the Air Force in the future, by relying exclusively on local governments to control land use in the accident potential and noise zones. (See pp. 26 to 27.)

Both policies must weigh the risks of dependence on local control of land use against the costs of purchasing land or land rights. The decisions to be made in these cases must be administrative judgments. Because of their effect on costs and future flight operations, GAO would only point out that the different approaches of the two services should be carefully reviewed by the Department of Defense. (See p. 28.)

Since fiscal year 1973 the Congress has authorized \$119 million and appropriated \$69 million for Navy and Air Force program projects such as buying land, building acoustical enclosures, and modifying runways. The Navy estimates that, if it is unable in the future to rely on local zoning control, it may need well over \$200 million to purchase land and land rights. The Air Force estimates that the remainder of its program will cost about \$35 million. (See p. 4.)

## RECOMMENDATIONS

The Secretary of Defense should direct the Secretaries of the Navy and Air Force to review the data used to establish noise zones to make the zones more accurate and credible, and to revise and reissue individual studies where operations have changed. The Air Force and Navy agreed with the recommendations. (See p. 17.)

The Secretary of Defense should review the plans and practices of the Navy and the Air Force, to assure that they are consistent with Defense policy. (See p. 28.)

This report was discussed with Department of Defense representatives and their comments are incorporated as deemed necessary.





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ABBREVIATIONS

AICUZ	air installation compatible use zones
APZ	accident potential zone
DOD	Department of Defense
HUD	Department of Housing and Urban Development
Ldn	day-night average sound level



## CHAPTER 1

### LAND USE PROBLEMS AROUND AIR BASES

Accident risk and recurring noise of flight operations at air bases interfere with the safe and comfortable use of land under the flight patterns. Conversely, features (such as tall structures, smoke, and electronic signals) in the paths of runways can interfere with safe takeoffs and landings.

Land use around air bases became a problem as runways were extended to handle faster and larger military planes and as the surrounding areas built up to accommodate a larger and more mobile population. The problem is how to have privately-owned land around air bases used in ways that are compatible with flight operations necessary for national defense.

Compatible land use would limit the number of people exposed to accident risk and noise at the 200 Department of Defense (DOD) air bases and would support the safety of the personnel operating the Department's 20,000 aircraft. There are numerous controls to attain compatible development including cooperative land use plans, zoning, local building codes, and acquisition of land interests by the Federal Government.

The Congress has recognized the adverse effects of airport operations on the surrounding area. For example, in 1964 the Congress amended the Federal Aid to Airports Act of 1946 (49 U.S.C. 1110(4), now 1718(4)), to require that any airport receiving Federal funds must have taken appropriate action to restrict the use of surrounding land to activities compatible with normal airport operations. The Noise Control Act of 1972 (42 U.S.C. 4901-4918) required the Environmental Protection Agency to propose regulations controlling and abating aircraft noise for the public's health and welfare, but the act, however, exempts military equipment.

#### DOD GUIDELINES

In response to such laws and the rapid buildup around its airfields, DOD initiated an air installation compatible use zones (AICUZ) program in 1973. The program

goal is to foster land use planning in high risk and noise areas of military air installations consistent with the health, safety, and welfare of area land users and air operations at the installations.

DOD issued guidelines in April 1975 to identify realistic accident potential zones (APZs) and compatible land uses which can be recommended to appropriate local planning agencies.

In October 1975, after congressional committees expressed concern over the program's direction, DOD notified the services that its basic policy on AICUZ supports the local community's responsibility for the health, welfare, and safety of its residents by providing the local governing bodies with technical information on which appropriate land use actions could be taken.

DOD's compatible use zones instruction (32 C.F.R. 256), issued in January 1977, stressed DOD's intention to take all reasonable, economical, and practical measures to reduce and control flight noise and reaffirmed its April and October 1975 guidance. DOD then established the day-night average sound level (Ldn) for describing aircraft noise. DOD required that each air base, by detailed study of flight operations, noise safety surveys, and best available projections of future flying activities,

- determine desirable restrictions on land use due to the noise characteristics and flight safety;
- identify present and potential incompatible land uses;
- indicate desirable types of development for various land tracts;
- estimate land value for the zones in question;
- review airfield master plans to insure that existing and future facilities siting is consistent with DOD policies;
- consider joint use of airfields by the military services whenever such use will

result in maintaining operational capabilities while reducing noise, real estate, and construction requirements; and

--include recommendations for cooperating with local boards, keeping land acquisition to a minimum, relocating bases, and taking other actions based on the study results.

DOD requires the military services to coordinate the AICUZ studies with area planning and regulatory agencies and to work with local, State, and Federal agencies to achieve compatible land use. The studies serve as the basis for land acquisition and disposal around military airfields.

#### PROGRAM SCOPE

Currently the Navy (including Marine Corps) and Air Force have 145 installations in their AICUZ programs. Some installations have several airfields, heliports, and auxiliary or outlying landing fields. The following table shows the status of the installation reports as of August 1978.

<u>AICUZ program installations</u>	<u>AICUZ reports</u>	
	<u>Completed</u>	<u>In progress</u>
Navy (including Marine Corps)	61	9
Air Force	84	21

The Army has 52 installations that conduct air operations. At present the Army does not have an active AICUZ program because its smaller and less noisy aircraft do not have as great an impact on the community as those used by the Navy and Air Force. This was the case at the two Army installations that we reviewed. The composition, worldwide, of Army aircraft is approximately 9 percent small, light, fixed-wing, and 91 percent helicopter. Due to the capabilities of the helicopter to maneuver, nearly all noise impacts can be adjusted by operational changes. The Army is currently revising its installation master planning regulation to implement the AICUZ program. This implementation will consider not only the effects of air operations on the base environs, but also the effects of artillery, explosive, and vehicle operations. To date, the Army has not requested funds for compatible use zones projects; how-

ever, upon complete implementation under the revised regulation it is expected that new AICUZ studies will result in a limited number of real estate actions.

From fiscal year 1973 to fiscal year 1979, the Congress authorized and appropriated \$37.6 million for the Air Force to acquire property interests in clear zones. The Air Force has used \$20.4 million to acquire interests in 3,712 acres at 33 bases. The Air Force estimates that the remainder of its program, to acquire property interests in clear zones, will cost about \$35 million.

During the same period the Congress authorized the Navy \$81.4 million and appropriated \$31.4 million for compatible use zones projects. The Navy has used authorizations of \$12.4 million in acquiring land interests through exchanges of properties, and \$12.9 million in authorizations and appropriations to purchase land, construct acoustical enclosures, and make runway modifications.

Because the Navy bases are generally in more congested areas and land values are higher, the Navy has no firm estimate of the cost to purchase land or land rights if it could not rely on local zoning to prevent encroachment. According to the Navy, the purchase of all clear zone land not owned by the Navy would cost about \$250 million.

## CHAPTER 2

### COMPATIBLE USE ZONES PROGRAM

The compatible use zones program is progressing toward its goal of fostering land use planning around air bases by informing and influencing the local communities, but the program alone cannot prevent incompatible development. Successful land use planning depends on the values and cooperation of the community.

#### PROGRAM OBJECTIVE

The program objective is to insure the continued operational capability of each military air base while at the same time protecting the public from aircraft noise and accident hazards. The area affected by noise and accident hazards is known as the air installation compatible use zone. The zone consists of high accident and noise areas which overlap in varying degrees.

The size and shape of each compatible use zone is determined by the air base's mission, type of aircraft, flight traffic volume, and runway layout. One mission of military air bases is to train flight crews to operate various aircraft such as fighters, tankers, transports, bombers, and helicopters. In 1 year the flight operations (each takeoff or landing) at eight fixed-wing air bases in our scope of review ranged from about 53,000 at an armament testing base to 485,000 at a training base.

The DOD program instruction classifies runways into those for light aircraft (class A) and those for heavy or high performance aircraft (class B). Three accident zones extend from each end of a runway according to the degree of accident potential--high (clear zone), significant (zone I), and measurable (zone II). Noise zones are the areas outlined by concentric contours of average noise levels in the air base's vicinity. An overlay of the accident potential zones and noise zones on base drawings identifies the AICUZ. The studies list as a guide for local planners land use objectives or compatibility guidelines for each zone. The chart on p. 6 is one example. In the chart, the accident zones A, B, and C are comparable to the clear zone, zone I, and zone II. Noise zones 3, 2, and 1 indicate decreasing noise intensity.

Compatible Land Use Objectives  
Navy Air Station Cecil Field, Florida

Land use	APZs Noise zones	Land use objectives (note a)							
		A	B	B	C	C	C	C	
Residential - mobile home		1	1	1	1	1	1	1	2
Residential - agricultural		1	1	1	1	2	2	1	2
Residential - single family (1 to 5 dwelling units/acre)		1	1	1	1	2	2	1	2
Residential - medium density (5 to 15 dwelling units/acre)		1	1	1	1	1	1	1	2
Residential - high density (over 15 dwelling units/acre)		1	1	1	1	1	1	1	2
Residential - transient lodging		1	1	1	1	1	1	2	2
Schools, libraries, churches		1	1	1	1	1	1	1	2
Hospitals, nursing home		1	1	1	1	1	1	1	2
Commercial - retail, movie theaters, restaurants		1	1	1	2	2	2	2	2
Commercial - wholesale		1	2	2	2	2	3	2	2
Office - personal, business & professional		1	1	1	2	2	3	2	2
Industrial - service		1	2	2	2	2	3	2	2
Industrial - manufacturing		1	2	2	2	2	3	2	2
Manufacturing, communication (noise sensitive)		1	2	2	2	2	3	2	2
Neighborhood parks, playgrounds		1	1	1	2	2	2	2	3
Sports arenas, outdoor spectator sports		1	1	1	1	1	1	1	3
Golf courses, riding stables		1	2	2	2	2	3	2	2
Water - recreational		1	2	2	2	2	3	2	2
Auditoriums, concert halls, music shells		1	1	1	1	1	1	1	2
Livestock farming, animal breeding		1	3	3	3	3	3	3	3
Agriculture (except livestock), mining		3	3	3	3	3	3	3	3
Transportation, utilities		1	3	3	3	3	3	3	3
Public right-of-way		1	3	3	3	3	3	3	3
Extensive natural recreational areas		1	3	3	3	3	3	3	3

a/ Numbers are used to designate land use objectives as follows.

Number	Land use objective
1	<u>No New Development</u> - The land use and related structures are not compatible and should be prohibited.
2	<u>Restricted New Development</u> - The land use and related structures are generally compatible; however, some special factors should be considered.
3	<u>No Restrictions</u> - The land use and related structures are compatible without restrictions.



### Accident potential zones

Navy and Air Force studies of about 800 major aircraft accidents from 1968 through 1972 showed that 48 percent of the accidents occurred on the runway or in the clear zone. An additional 29 percent occurred in the two accident potential zones. Of the 167 accidents during the last 10 years at the bases we reviewed, 55 percent of accidents occurred on the runway or in the clear zone and 17 percent occurred in the two accident potential zones.

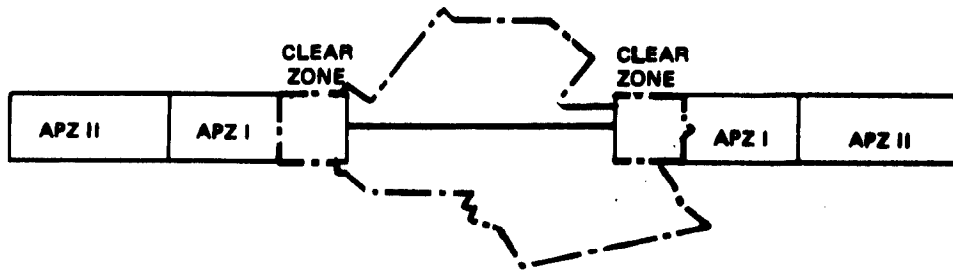
The accident zones for the Air Force bases generally represent rectangular patterns. The Navy clear zones included the entire runway and generally curve away from the runway ending in a fan shape. The Navy also shapes its accident zones to indicate accident potential at individual bases. The Navy formerly labeled its clear zone and APZs as zones A, B, and C, respectively. The Navy said that it now labels the zones according to Defense instructions. Accident zones for an Air Force and a Navy base are shown on page 8.

### Noise zones

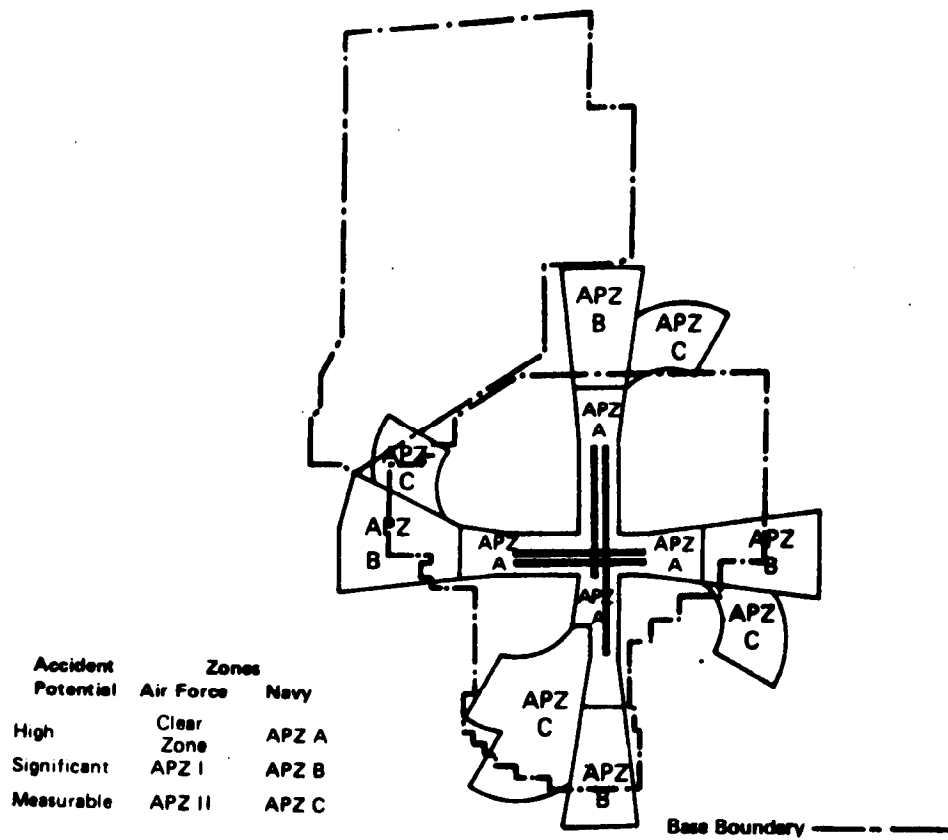
For land use planning around its air bases, DOD instructions issued in November 1977 require that noise contours be plotted for 80, 75, 70, and 65 Ldn. Previously, DOD divided the noise levels according to decreasing intensity into noise zones 3, 2, and 1:

- Zone 3 is defined as those areas in which the frequency and intensity of noise exposure greatly restrict the use of the area for human activity. Zone 3 noise is at least 75 Ldn.
- Zone 2 consists of those areas in which selected activities (such as commercial or industrial activities) are compatible. Other uses may be permitted but are generally incompatible with the noise environment. Zone 2 noise is between 65 and 75 Ldn.

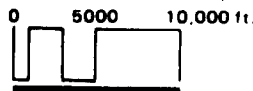
# AIR FORCE AND NAVY ACCIDENT POTENTIAL ZONES



**CASTLE AIR FORCE BASE, CALIFORNIA**



**NAVAL AIR STATION CECIL FIELD, FLORIDA**



--Zone 1 includes those areas in which the noise level does not impose any use restrictions. Zone 1 noise is below 65 Ldn.

Noise zones 2 and 3 generally overlap the three accident potential zones and determine the total compatible use zone acreage.

The air bases' noise contours were plotted under one of three different measures:

--Composite noise rating (used by one base).

--Community noise equivalent level (used by three bases).

--Day-night average sound level (used by five bases).

According to the joint services manual on noise planning the second and third measures will closely agree for most air bases. DOD adopted the day-night average sound levels in October 1975 and instructed its bases to collect enough data to compute the day-night average sound level contours and to plot the contours in the compatible use zone studies as soon as time and resources permit. (Selected noise contours are shown on pages 12 and 14.)

The joint services manual on noise planning notes that several military agencies have acquired computer capabilities for generating aircraft noise exposure contours. The complex prediction procedure contains a large number of parameters (aircraft types, variations in mission, flight paths, and operational procedures) required for an accurate estimation. The accuracy of computer-generated contours depends on the accuracy of the data supplied by individual installations.

#### OFF-BASE DEVELOPMENT IN THE COMPATIBLE USE ZONES

The 1970 population of the counties in which the nine Navy and Air Force bases were located ranged from 61,000 to 1.4 million. From 1940 to 1970, the populations of the counties grew from a low of about 225 percent to as much as 1,200 percent. The compatible use zones for the nine bases contained about 263,714 acres of which approximately 202,210 acres (77 percent) were offbase.

<u>Zone</u>	<u>Off-base acreage</u>
Clear zone	667
APZ I	9,117
APZ II	9,507
Noise zone 3	a/22,254
Noise zone 2	a/160,665
Total	<u>202,210</u>

a/ About half of these noise areas are at one bomber base.

#### Federal efforts for compatible use

The military's studies and the Department of Housing and Urban Development (HUD) and the Veterans Administration home loan programs encourage compatible use of off-base accident and noise zones.

The Navy and Air Force studies contain land use guideline tables that discourage residential development in the accident zones and noise zone 3, and in noise zone 2 without sound insulation. The services provide the studies to local governments for making land use decisions.

HUD discourages construction of new residences on sites within noise zones 3 and 2. It will approve projects in noise zone 2 if they are insulated against noise. A HUD official said that the agency has no firm policy for projects in accident potential zones; however, it tries to avoid insuring projects there.

Under its home loan guarantee program, the Veterans Administration has prepared guidelines for loans on homes located in noise zone 3 and under certain conditions in zone 2. When the agency guarantees loans for residences in noise zones, the veteran signs a statement indicating awareness that the property is near an airport and that noise may affect its livability. Loans are not guaranteed for residences in accident zones.

#### OPERATIONAL CHANGES

DOD policy requires air bases to take all reasonable, economical, and practical measures to reduce or

control noise from flight activities. All the bases that we visited had taken certain measures to reduce their noise impact on the community, such as

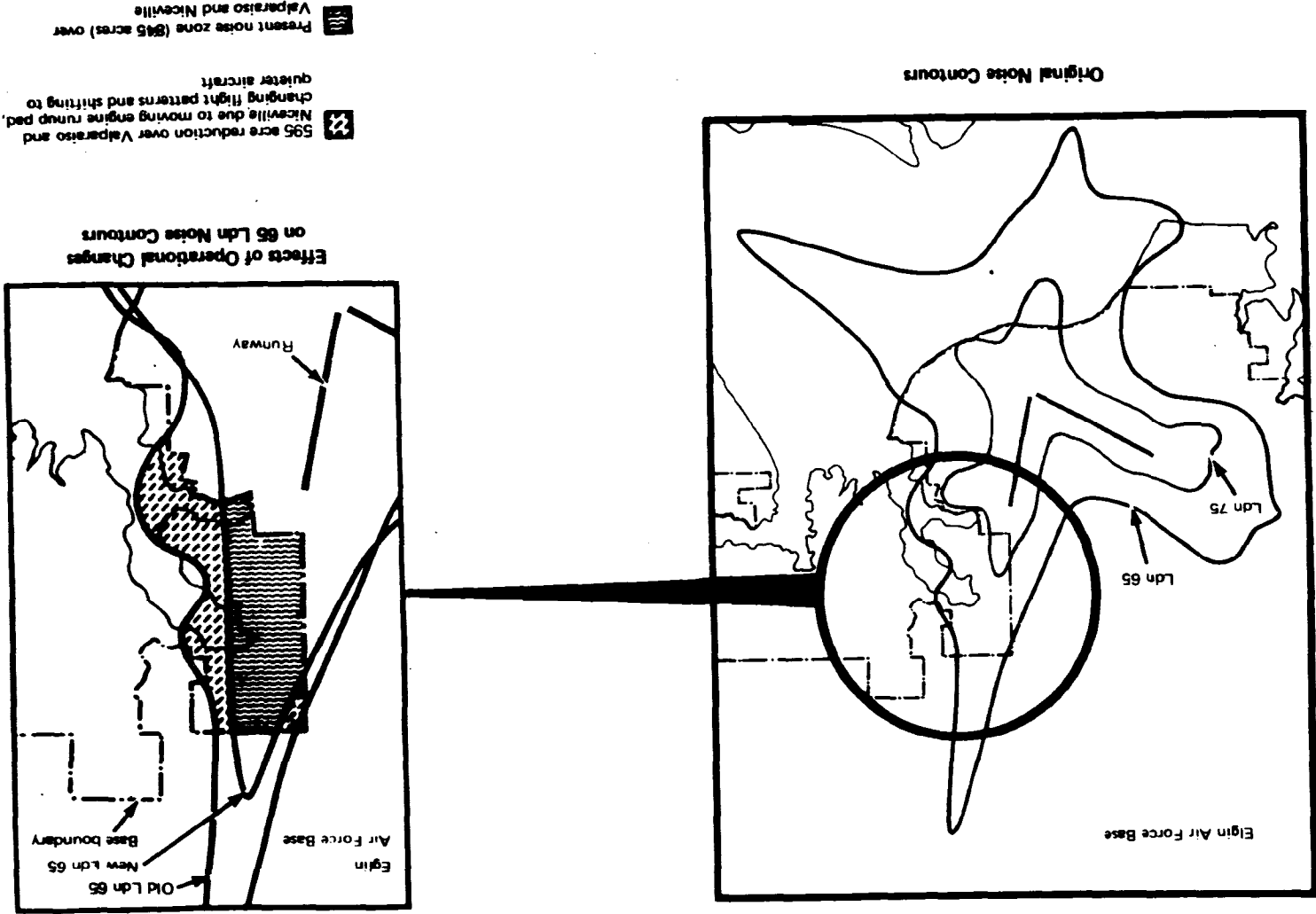
- modifying approach procedures;
- reducing climb speeds;
- restricting afterburner use;
- eliminating night operations;
- changing flight patterns;
- limiting the number of aircraft in training patterns;
- acquiring acoustical enclosures, noise suppressors, and engine test cells;
- relocating engine run-up stands; and
- curtailing night engine runups.

The effects of reducing the noise impact on the community are illustrated at Eglin Air Force Base, Florida. In the base's April 1976 study, about 1,440 acres of the cities of Valparaiso and Niceville were in a noise zone of at least 65 Ldn. In February 1977, the base issued revised noise maps to reflect the reduction of off-base noise zones by about 430 acres due to relocating engine run-up stands and changing flight patterns. Again in December 1977, the base revised its noise maps to recognize the future shift to a quieter aircraft which reduced the off-base noise area by an additional 165 acres. (See p. 12.)

Some maps do not reflect operational changes

One base took nearly 2 years to update its compatible use zones maps to reflect operational changes. Another base did not include the effects of an operational change in its original maps.

**OPERATIONAL CHANGES REDUCE NOISE IMPACT ON COMMUNITY  
 EGLIN AIR FORCE BASE, FLORIDA**



### Cecil Field

In a February 1976 study, the Naval Air Station, Cecil Field, Florida, pointed out that elimination of engine runups after 10 p.m. would shrink noise zone 3 by 1,683 acres and noise zone 2 by 9,350 acres. (See p. 14.) The study stated that if the change was made the base would release new noise maps. In August 1976 the base prohibited engine runups between 10 p.m. and 7 a.m. unless specifically authorized. The base also modified its flight patterns and established preferential runways to reduce its impact on the community. However, the base did not incorporate the effects of these changes into its compatible use zones map until March 1978 when the old composite noise rating contours were converted to the Ldn contours. (See p. 15.)

### El Toro

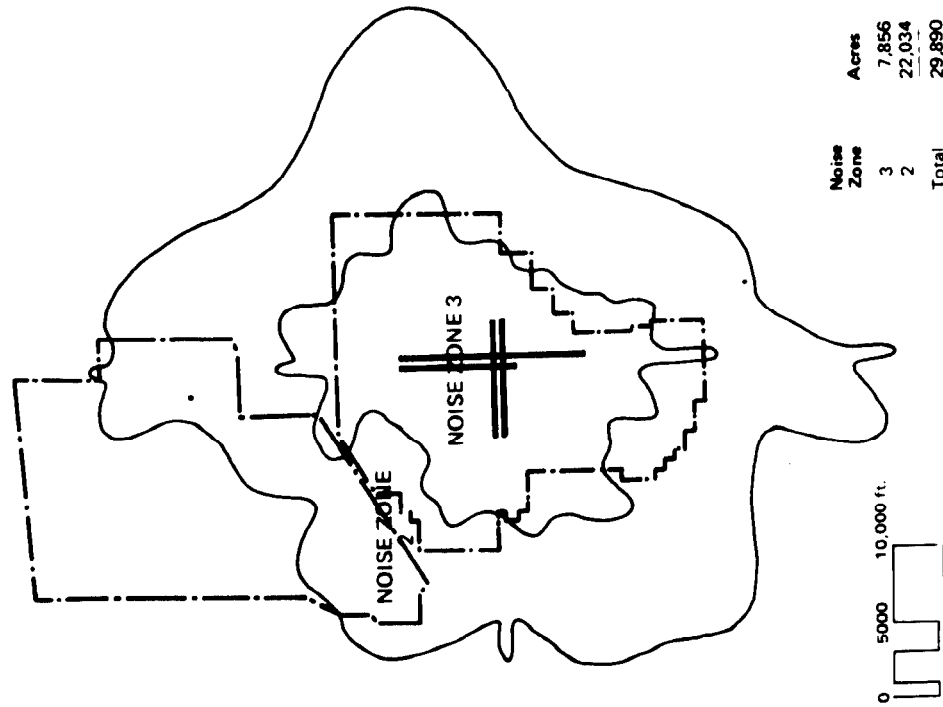
The study by the Marine Corps Air Station, El Toro, California, discussed overhead arrival restrictions for one runway which would reduce the third accident zone by 100 acres. According to the study the measures were adopted, but the changes were not reflected in the base's compatible use zones map. A December 1977 letter from the base commander to the Commandant of the Marine Corps discussing land acquisitions to implement the base AICUZ program considered these areas as part of the base's land acquisition requirements.

Naval officials said that the Navy lacked funds to update the Cecil Field study in a more timely manner. In the future the Navy plans to update base compatible use zones studies along with the base master plans in 3-, 6-, or 9-year cycles depending on the changes that take place. The officials said failure to include the effects of the operational change in the El Toro map was an oversight and would be corrected when the base's study is updated.

### INFORMATION PROVIDED TO COMMUNITIES COULD BE IMPROVED

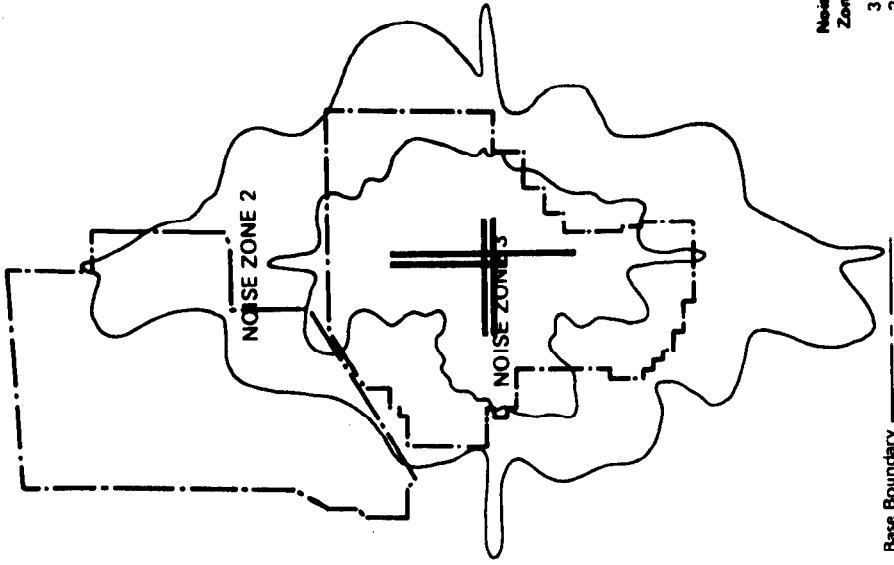
At two Air Force bases, noise contours adversely affected nearby communities. The bases tried to reduce their initial impact on the communities. The adverse impact may have been avoided or minimized if the bases had recognized the studies' effects on the communities

**EFFECT OF OPERATIONAL CHANGES ON NOISE CONTOURS  
NAVAL AIR STATION CECIL FIELD, FLORIDA**



Noise Zone	Acres
3	7,856
2	22,034
Total	29,890

**ORIGINAL NOISE CONTOURS  
ISSUED TO THE COMMUNITY**



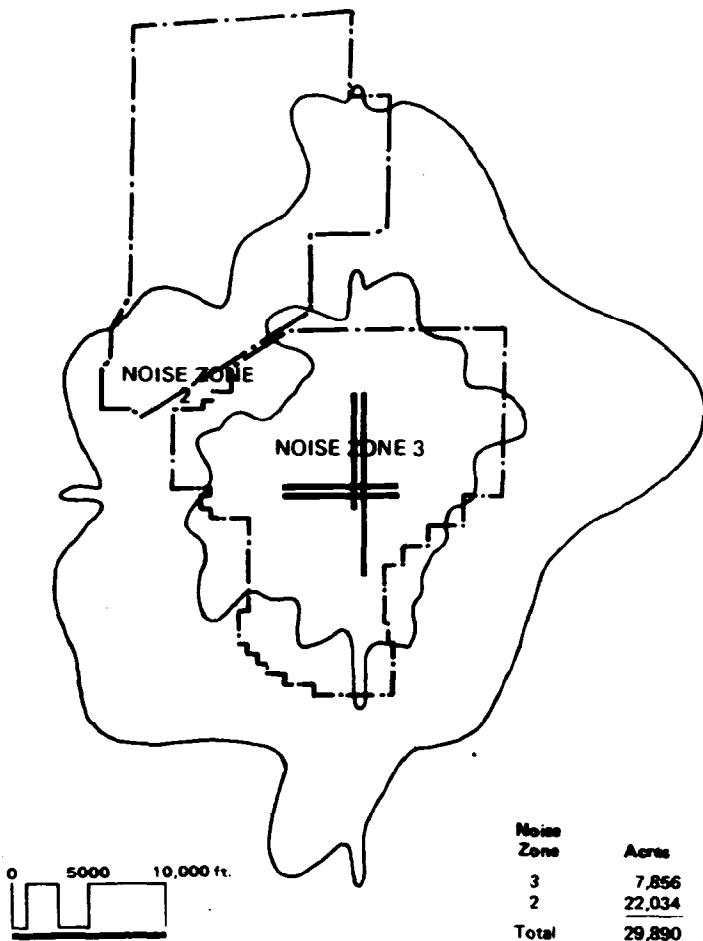
Noise Zone	Acres
3	6,173
2	12,684
Total	18,857

**NOISE CONTOURS AFTER ELIMINATING  
ENGINE RUNUPS AT NIGHT**

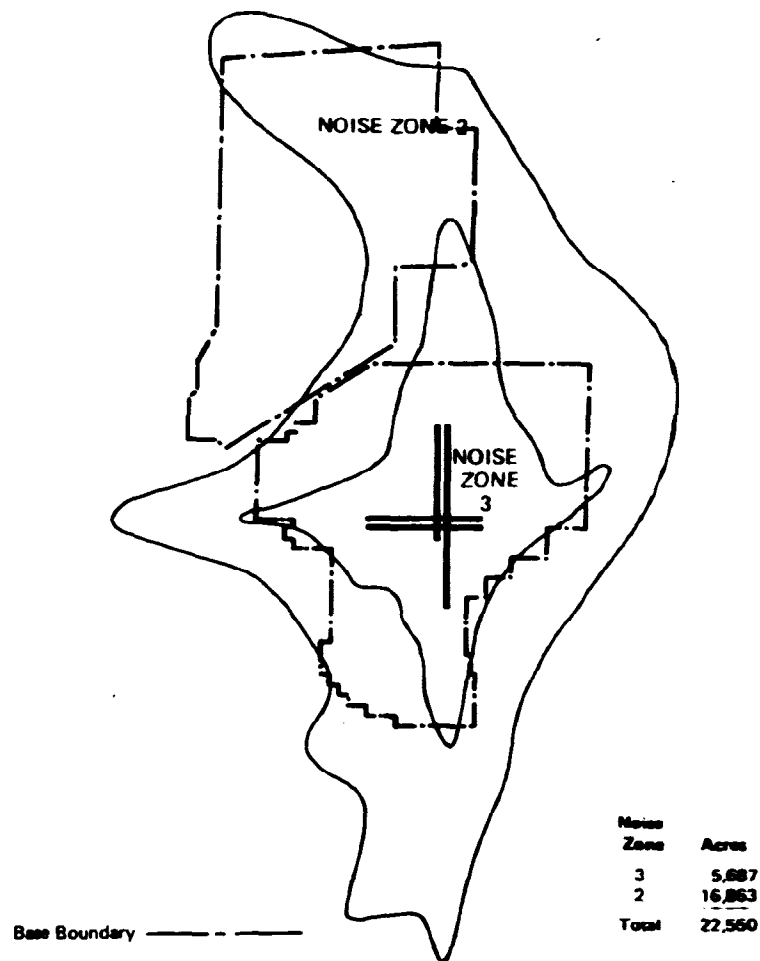


**COMPARISON OF ORIGINAL AND CURRENT NOISE CONTOURS  
NAVAL AIR STATION CECIL FIELD, FLORIDA**

15



**ORIGINAL COMPOSITE NOISE RATING CONTOURS  
ISSUED TO THE COMMUNITY**



**CURRENT DAY-NIGHT AVERAGE SOUND LEVEL  
CONTOURS SHOWING OPERATIONAL CHANGES**

and taken corrective steps before their release. The Air Force believes that its refinement of coordination procedures has since minimized adverse community reaction.

### Eglin

When Eglin released its April 1976 compatible use study, the City of Valparaiso was concerned because much of the city was in the base's high noise zone. The city feared the loss of HUD and Veterans Administration home loan programs.

The study also identified the base's clear zones as 3,000-foot-square areas at the ends of its runways and announced plans to acquire the off-base clear zone which included several residences. A city official said that after the study's release some residents in the clear zone area tried to sell their property but found that the property values had decreased.

In February and December 1977, the base revised the study to decrease the noise zones. (See p. 12.) The December revision also redefined the offbase clear zone. In February 1978 the base announced that it would not purchase residential property. Homeowners were very dissatisfied with the Air Force actions because they felt that the clear zone stigma placed on their homes by the original study would make it impossible for them to sell their homes at a fair price. City officials were concerned that the base had not worked more closely with the citizens on this decision and suggested establishing a combined working group. The base agreed.

### Castle

When the Air Force publicized composite noise rating contours for Castle Air Force Base in October 1972, HUD began using the contours in determining eligibility for mortgage insurance. As a result, Atwater, a nearby city, lost eligibility for mortgage insurance on most new construction. Recognizing inadequacies in the composite noise rating contours, the Air Force began developing new contours using the noise exposure forecast method. The Air Force issued its September 1974 compatible use zones study with revised noise contours that incorporated operational changes.

City of Merced officials said that HUD used the study's noise contours, which encompassed the city of Merced, as a basis for not insuring homes within the affected area.

In May 1976 the Air Force issued revised noise contours which used the Ldn system and incorporated operational changes. However, part of noise zone 3 was incorrectly situated over a proposed residential development because two traffic pattern legs under visual flight rules were drawn 7,000 feet and 3,000 feet further out from the runway than the actual patterns shown by the base records. The Air Force expects to correct this in early 1979.

### CONCLUSIONS

Accident potential and noise from flight operations at military air bases affect millions of people and thousands of acres of private property. Controlled land development of the surrounding area is necessary to assure flight safety and to protect the public. We believe that DOD's compatible use zones program is a commendable first step in achieving the necessary compatible development. For the program to be most effective, we believe that establishing accurate and credible accident and noise contours is essential.

### RECOMMENDATIONS

We recommend that the Secretary of Defense direct the Secretaries of the Navy and Air Force to review the data used to establish noise zones to make the zones more accurate and credible, and to revise and reissue individual studies where operations have changed.

The Air Force and Navy agreed with the recommendations. The Air Force said that the recommendation is consistent with its existing policy and practice. The Navy said that its noise contours are updated in conjunction with installations' master planning process in a 3-, 6-, or 9-year cycle.

## CHAPTER 3

### COMMUNITY AND BASE ACTIONS

Local communities are responsible for land use controls within their jurisdictions. The effectiveness of controls (such as land use plans, zoning laws, and noise insulation codes) is influenced by the local communities' economic dependence on the airfields' presence and the pressure for residential, commercial, and industrial development of surrounding private lands.

#### LAND USE CONTROLS

The three States (Arizona, California, and Florida) where the air bases in our review completed compatible use zones studies all have laws encouraging land use plans to protect military airfields.

In 1977, the State of Arizona placed a 16-month moratorium on building around military air bases to allow local jurisdictions time to draw up general land use guides for compatible development. Local governments could, however, exempt themselves.

The Arizona Land Use and Planning Office will exchange State lands for land planned for incompatible development around air bases in return for Federal land. In June 1978, Arizona passed a law authorizing local jurisdictions to protect land around military air bases by land purchase or exchange.

Maricopa County (Arizona), where Luke Air Force Base and Williams Air Force Base are located, adopted the building moratorium and expected to complete a master land use plan by December 1978. In December 1977, the county planning and zoning commission recommended and the county adopted a sound insulation standard for all new residential construction in high noise areas around Luke Air Force Base and Williams Air Force Base. The commission predicated its recommendation partly on its finding that the continued operations of aircraft from the two air bases are essential for national defense and highly important for the economic health of Maricopa County and the State of Arizona.

Yuma County (Arizona), where Yuma Marine Corps Air Station is located, exempted itself from the building moratorium since the county already had airport hazard zoning around part of the air station. The Yuma Marine Corps Air Station receives commercial flights under a joint-use agreement with Yuma County Airport Authority. In 1976 the authority contracted for an airport master plan. In 1977, the City of Yuma approved the building of 18 condominiums within one of the runway clear zones even though the base commander told the zoning commission that the development was clearly incompatible with airport operations. In February 1978, the County considered the air station's compatible use zone report and recommended that no residences be constructed in noise zone 3 and that noise insulation be installed in buildings in noise zone 2.

The State of California passed a law in 1967 creating airport land use commissions at the county level empowered to adopt comprehensive land use planning guides for areas around military airfields.

The Airport Land Use Commission for Orange County (California), where the El Toro Marine Corps Air Station is located, developed a plan with a larger noise area around the air station than shown in the station's compatible use zone study. The commission disapproves homesites inside a community noise equivalent level of 65, but the commission's disapproval can be overruled by a four-fifths vote of the county board of supervisors or the Irvine City Council. Irvine City has accepted two residential developments inside the noise equivalent level of 65, provided insulation reduces outside noise to 45 decibels. The Irvine Company, the major landowner in Orange County, believes that the air station's study recommendations are too general.

The Comprehensive Planning Organization (the name of the airport land use commission for San Diego County where Miramar Naval Air Station is located), together with the City of San Diego and the University of California, did a noise study in 1976. The noise contours are used in the air station's compatible use zones study. The planning organizations, like the Orange County commission, disapprove homesites above a community noise equivalent level of 65 and require insulation in the 60 to 65 level. These rules can also be overruled by a four-fifths vote

of the San Diego City Council. The City of San Diego does not have a rule against homesites inside the noise equivalent level of 65 provided that building plans certify a reduction of outside noise to the 45 level. The City informed the Navy in 1976 that it could not control development in the second accident zone by the current zoning laws.

Merced County surrounds all but 1,900 feet of the boundary of Castle Air Force Base. The county land use plan has most of the land around Castle zoned for agriculture. Other land bordering Castle for about 3,000 feet is zoned for residences. However, the county has a rule against subdividing land into less than 20-acre parcels. Officials of Merced County and the City of Merced said that they do not require insulation against noise because it would increase building costs. The 1,900-foot border of the air base outside the county is occupied by the town of Atwater, and is zoned for various land uses such as shops and residences. The town claims no noise problem. None of the local jurisdictions made any zoning changes after reviewing the air base's compatible use zones study.

The State of Florida passed the Local Government Comprehensive Planning Act in 1975 requiring cities to develop land use plans by July 1979.

The City of Jacksonville, occupying all of Duval County, surrounds most of Cecil Field Naval Air Station and all of its outlying field, Whitehouse, as well as two other naval air stations, Jacksonville and Mayport. In July 1978, the City adopted a proposal promoted by Cecil Field known as overlay zoning which would conform the zoning around the air stations to the air stations' compatible use zones. The Navy believes that this concept could serve as a model for land use planning around most airfields.

The City of Valparaiso, Florida, adjoins Eglin Air Force Base. Most of the City is within the 65 Ldn, including portions lying within the accident zones. The West Florida Regional Planning Council is developing a comprehensive land use plan for Valparaiso that incorporates some of the air base's study recommendations. The plan was about three-quarters complete in February 1978.

## COOPERATION WITH COMMUNITIES

The air bases have made substantial efforts to cooperate with local communities and to reduce the impact of flight activities on them. However, we noted instances where compatible use zones studies need to be updated to reflect operational changes, and information subject to revision was provided to communities and adversely affected property values.

Among the bases' efforts to cooperate by reducing the effect of flight operations on the communities were

- making operational changes (p. 10),
- maintaining logs on complaints about noise to determine the causes and to seek ways to eliminate them,
- advocating truth-in-sales notices to make home buyers aware of flight activities when buying a home,
- presenting the bases' position at zoning and development hearings,
- installing a beacon to warn pilots to avoid flying over a populated area at night,
- promoting overlay zoning to achieve compatible development, and
- working with Federal, State, county, and city agencies to draft State airport zoning legislation.

## LAND ACQUISITIONS

DOD's policy on acquiring property is that the services are, first, to acquire the clear zones in fee or easement whenever practicable and, second, to acquire land in the accident potential zones and high noise areas only after all possibilities of achieving acceptable zoning or similar protection have been exhausted and the operational integrity of the base has been manifestly threatened.

At 8 bases we visited, 5 had acquired interests (either restrictive easements or fee title) in 2,165 acres for about \$13 million, and 3 bases plan to acquire interest in an additional 879 acres for about \$14 million. About 96 percent of the total costs at these bases are at the 4 Navy bases.

Different encroachment problems  
of the Navy and Air Force

Navy air bases are generally located in areas of greater population density and land development than are most Air Force bases. For that reason, the land surrounding Navy bases is more expensive on the average than land adjacent to Air Force bases. These land conditions led the Air Force and the Navy to take different approaches in carrying out Defense's policy for securing compatible land use.

The Navy does not limit acquisition of land or land rights to the clear zones, and does not consider it necessary or practical to control all clear zones. According to the Navy the extent of encroachment varies with each base, and so the policy must be flexible enough to meet these different conditions. The Navy informed us that it does not consider the acquisition of a clear zone, where land use is compatible and expected to be so for a long time, to be as high a priority as acquisition of accident potential or high noise zones at a base where the operational capability is threatened. The Navy would acquire land or land rights in the latter situations, before acquiring clear zones where land use is compatible.

The Air Force policy is to control the clear zones by purchase at all its bases. Its officials do not believe they need to control other areas.

The following table shows actual or planned acquisition at the 8 bases we visited.



Land Interests Acquired  
or Planned by Selected Bases

Base	Cost	Total	Acreage and location				
			Accident potential Clear zone	zone I	zone II	Noise zone 3 2	
<u>Land interests acquired</u>							
Navy:							
Cecil Field	\$ 1,900,000	951	-	405	326	10	210
El Toro (including Santa Ana)	a/ 10,047,100	731	219	455	-	39	18
Subtotal	<u>11,947,100</u>	<u>1,682</u>	<u>219</u>	<u>860</u>	<u>326</u>	<u>49</u>	<u>228</u>
Air Force:							
Castle	310,198	147	147	-	-	-	-
Luke	169,093	68	68	-	-	-	-
Williams	535,798	268	268	-	-	-	-
Subtotal	<u>1,015,089</u>	<u>483</u>	<u>483</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Total	<u>\$12,962,189</u>	<u>2,165</u>	<u>702</u>	<u>860</u>	<u>326</u>	<u>49</u>	<u>228</u>
<u>Partially completed or planned acquisitions</u>							
Navy:							
Miramar	b/\$12,872,000	782	-	607	-	-	175
Yuma	930,500	77	77	-	-	-	-
Subtotal	<u>13,802,500</u>	<u>859</u>	<u>77</u>	<u>607</u>	<u>-</u>	<u>-</u>	<u>175</u>
Air Force:							
Eglin	126,000	20	20	-	-	-	-
Total	<u>\$13,928,500</u>	<u>879</u>	<u>97</u>	<u>607</u>	<u>-</u>	<u>-</u>	<u>175</u>

a/Represents value of the property exchanged for the 731 acres.

b/Includes estimated cost of land to be purchased and value of land to be exchanged.

## Justifications for these acquisitions

The 4 Navy bases justified acquiring property interests based on potential incompatible development and adverse citizen reaction to aircraft noise. The Air Force bases carried out the Air Force plan to acquire all clear zones.

### Cecil Field

The Navy acquired 951 acres at Cecil Field, which included 220 acres of high noise areas. (See p. 23.) Over 90 percent of the area, located in a residential growth corridor, is zoned to allow residential development, but the remainder is zoned for commercial and industrial uses. In justifying this planned acquisition, the Navy cited the likely substantial residential development that would be partially located in the accident area, and accompanying citizen complaints concerning noise which the Navy feels would bring pressure to severely restrict the base's operations.

The Navy informed us that it was acquiring acreage in high noise areas at Cecil Field, primarily because if it purchased land in the accident potential zones only the remainder of the owners' property would be useless.

The City of Jacksonville adopted overlay zoning which made the planned acquisition of an additional 267 acres unnecessary.

### El Toro

In August 1976 El Toro exchanged fee title to 239 acres valued at about \$10 million for fee title to 729 acres. In hearings on the fiscal year 1973 military construction authorizations, the Navy told the Congress that the project's purpose was to protect the base's operational capability by insuring compatible development of surrounding areas.

Our analysis of the existing zoning, and the community's and Navy's proposed land uses for the 729 acres, described in the base AICUZ study, showed that 180 acres of the acquired property had existing zoning and planned community uses compatible with the Navy's recommendations. In addition, the Orange County Airport Land Use Commission

adopted the base's April 1976 AICUZ accident and noise contours for taking advisory actions on proposed development around the base.

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In regard to the Cecil Field and El Toro land acquisitions, Navy officials said that although communities may zone areas compatible with base needs, compatible zoning does not always result in compatible development. They cited an example at the Naval Air Station Oceana, Virginia, where the community had compatibly zoned areas around the base, but was allowing incompatible development by granting zoning variances. The officials said that acquiring control over the properties now would be less expensive than waiting for owners to begin incompatible development.

#### Air Force

Castle, Luke, and Williams air bases have acquired interests in 483 acres in clear zones for about \$1 million. Eglin plans to acquire 20 acres for \$126,000. The bases identified the clear zones using DOD guidance, and justified their purchases according to Air Force policy to control all clear zone properties. The bases' studies did not discuss possible compatible uses of the clear zones--only plans to buy the property. Nearby communities are in the process of updating their land use plans, and indicated that they would consider and perhaps incorporate some of the compatible use study recommendations.

An Air Force official said that because of the severe land use restrictions placed on the clear zone, the Air Force studies do not discuss possible compatible uses of the zones and, where possible, the Air Force is acquiring restrictive easements.

Air Force officials also informed us that they do not believe that acquiring rights in the clear zone should be deferred until development threatens flight or public safety, because then it is too late. They added that the delay between recognizing the development threat and obtaining funds to purchase rights can be as long as 2 or 3 years.

The question of when to purchase  
or rely on local government control

Reliance on local zoning and other land use restrictions, even though currently maintaining compatible land use around air bases, admittedly has some risk. Both the Air Force and the Navy have experienced changes in zoning or variances to zoning restrictions, which permitted incompatible use in accident and noise areas.

The Air Force does not want to take this risk in the potentially high accident clear zones. At the same time the Air Force has relatively less expensive land around its bases, and attempts to obtain restrictive easements rather than outright purchase where possible.

Because of the high cost of land around many of its bases, the Navy considers it necessary to place more reliance than the Air Force does on local zoning and other restrictions over the clear zone areas not owned by the Navy. On the other hand, the Navy purchases land and easements in accident potential and noise zones, where it believes encroaching development threatens.

Regarding high noise areas, acquisition does not necessarily solve the air bases' problems of complaints. Our analysis of citizen noise complaints at Cecil Field and the other bases we visited showed that the majority of the noise complaints originated from developed areas outside of the bases' high noise zones. Therefore, acquiring control of high noise areas would not eliminate citizens' complaints.

A Navy official told us that the public's legal recourse against the Government for aircraft noise is inverse condemnation--taking of private property without just compensation. Inverse condemnation is based on the Tucker Act (28 U.S.C. 1491) which allows suits against the Government on any express or implied contract. He stated that it is unlikely for any suits under the act to be successful, because a suit must be filed within 6 years of the taking, and aircraft must fly directly over the property involved. In cases where a base changes its mission or operations, the statute would begin to run again; however, recovery would be in proportion to the increase in noise attributed to such change.

There also appear to be some inconsistencies in the application of the Navy's policy to rely on local zoning restrictions to control land surrounding its airfields. As described above, the Navy is purchasing land in accident potential and noise zones, where current or planned zoning is compatible with flight operations.

## CONCLUSIONS

The effectiveness of controls such as land use plans, zoning laws, and noise insulation codes is influenced by the local communities' economic dependence on the airfields' presence and the pressure for residential, commercial, and industrial development of surrounding private lands. The air installation compatible use zones program which DOD initiated in 1973 was timely and forward-looking in its goal of fostering land use planning to protect the public and continue flight operations essential for national defense. The air installations' studies provide useful information for local governments to plan compatible land uses and for the Government to act on pending incompatible development.

Defense's compatible use zones program has foresight and is essential for achieving compatible land use around military airfields. The bases' efforts in cooperating with communities, reporting on the need for compatible land use, and making operational changes have, in most cases, been successful in lessening the impact of flight activities on base environs and in furthering community and base land use needs.

We recognize that the approaches of both the Navy and the Air Force to acquiring property interests are sound in principle. In view of the generally lower land values around Air Force bases, the acquisition of clear zone land rights, particularly when restrictive easements can be acquired, appears to be relatively inexpensive insurance for long range protection. The Navy's greater reliance on local government control of land use, within as well as outside the clear zone, also has merit, although there seem to be some inconsistencies in application of the policy. There may also be some problems for the Air Force in the future, by relying exclusively on local government to control land use in the accident potential and noise zones.

Both policies must weigh the risks of dependence on local control of land use against the costs of purchasing land or land rights. The decisions to be made in these cases must be administrative judgments. Because of their effect on costs and future flight operations, we would only point out that the different approaches of the two services should be carefully reviewed by the Department of Defense.

#### RECOMMENDATION

We recommend that the Secretary of Defense review the respective land acquisition policies of the Navy and the Air Force, and the extent of their reliance on local zoning and other restrictions, to assure that services' plans and practices are consistent with Defense policy.

## CHAPTER 4

### SCOPE OF REVIEW

We examined Department of Defense policies, instructions, and studies on its air installation compatible use zones program. We visited 11 airfields (2 Army, 5 Navy, and 4 Air Force) and reviewed their efforts to achieve compatible land use in the community including projects for acquiring land control and for suppressing noise. We interviewed cognizant agency and community officials and, where appropriate, incorporated their comments.

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