DRAFT

OAKLAND INTERNATIONAL AIRPORT

Airport Land Use Compatibility Plan

Prepared for
Alameda County ALUC

September 2010

ESA

DRAFT

Oakland International Airport

Airport Land Use Compatibility Plan

Prepared for
Alameda County ALUC

September 2010

2600 Capitol Avenue
Suite 200
Sacramento, CA 95816
916.564.4500
www.esassoc.com

Los Angeles

Oakland

Olympia

Petaluma

Portland

San Diego

San Francisco

Seattle

Tampa

Woodland Hills

202229

TABLE OF CONTENTS

Oakland International Airport
Land Use Compatibility Plan

Page

Appendices

List of Figures

List of Tables

CHAPTER 1
Introduction

1.1 Plan Overview

The State Aeronautics Act (Public Utilities Code, Section 21670 *et seq.*) requires the preparation of an airport land use compatibility plan (ALUCP) for nearly all public-use airports in the state (Section 21675). The intent of the ALUCP is to encourage compatibility between airports and the various land uses that surround them. Alameda County (the County) has established an airport land use commission (ALUC), in accordance with state law, to prepare land use compatibility plans for all public-use airports in the County and to review general plans, proposed changes to zoning codes and ordinances, land use actions and development projects, and airport development plans for consistency with compatibility policies.

1.1.1 Function and Applicability of the Plan

The *Oakland International Airport Land Use Compatibility Plan* is the primary document used by the Alameda County ALUC to help promote compatibility between Oakland International Airport (OAK) and its environs. More specifically, this ALUCP should act as a guide for the ALUC and local jurisdictions in safeguarding the general welfare of the public as OAK and the areas surrounding the Airport grow. This document shall also serve as a tool for the Alameda County ALUC in fulfilling its duty to review airport and land use development proposals within the airport influence area (AIA) or referral area associated with the airport.

The compatibility criteria set forth in this document shall be used by local agencies to prepare and amend land use plans and ordinances. California State law dictates that the County and affected cities modify their general and specific plans to be consistent with the ALUC's plan, or to take steps to overrule the ALUC. The AIA for OAK includes portions of the cities of Alameda, Oakland, San Leandro, Hayward, and unincorporated areas of the County; as such, this document is applicable to both cities and Alameda County as they prepare land use plans and review development proposals within the AIA. This document also applies to any future area that may be incorporated within any part of the AIA, as well to school districts, community college districts, and special districts, whenever these entities consider the development of new facilities or expansion of existing ones. Finally, this document should also be considered by land owners when proposing projects within the AIA.

This document replaces the *Alameda County Airport Land Use Policy Plan (ALUPP)*, which the ALUC adopted in 1986. Alameda County includes three public use airports: OAK, Livermore Municipal Airport (LVK), and Hayward Municipal Airport (HWD). This compatibility plan addresses only the AIA associated with OAK. Separate compatibility plans have been prepared for HWD and LVK (see Figure 1-1 for airport locations). This ALUCP is based on a long-range master plan and airport layout plan (ALP) for OAK that reflects the expected growth of the Airport over a 20-year period.

1.1.2 Statutory Requirements

Powers and Duties

ALUCs are established pursuant to the State ALUC law[1] to protect the public health, safety, and welfare by promoting the orderly expansion of airports and adoption of land use measures by local public agencies to minimize exposure to excessive noise and safety hazards near airports. In accordance with Section 21674(b) of the California Public Utilities Code, an ALUC has the authority "to coordinate planning at the state, regional and local levels so as to provide for the orderly development of air transportation, while at the same time protecting the public health, safety, and welfare"; to prepare and adopt airport land use plans; and to review and make recommendations concerning specified plans, regulations and other actions of local agencies and airport operators. In addition, ALUCs review plans for proposed new airports or heliports.

Limitations

State law does not authorize ALUCs to zone property or apply other land use controls normally exercised by local public agencies. Because the jurisdiction of the ALUC is limited to new land uses, existing land uses that are in conflict with or affected by existing or anticipated airport operations are not subject to the policies established by the ALUC. However, existing incompatible uses are the concern of the airport and of the city or county having jurisdiction over the affected area, and policies should be developed to address this problem. The term "existing land uses" is further defined in Chapter 2.

State law does not provide ALUCs with jurisdiction over airport operations, although the ALUCP must include assumptions about future operations at each airport. Once adopted, the ALUCP serves as a framework for reviewing significant proposals for further airport development.

ALUC jurisdiction and ALUCP scope are confined to land use-related primary impacts on the area surrounding the airport. This excludes the ALUC from considering air quality impacts of the airport, and other "secondary" impacts such as traffic or air quality impacts caused by airport operations.

[1] The State ALUC law is contained in Public Utilities Code Article 3.5, State Aeronautics Act, Section 21661.5, Section 21670 *et seq*., and Government Code Section 65302.3 et seq. (see Appendix B).

SOURCE: DeLorme Street Atlas USA, 2000; and ESA, 2007

Oakland International Airport Land Use Compatibility Plan . 202229

Figure 1-1
Alameda County Airports

1.1.3 Alameda County Airport Land Use Commission

The seven-member Alameda County ALUC was created in 1971. After approving interim plans in the early 1970s, the ALUC adopted the ALUPP in 1977. The ALUPP was amended in 1979. The 1979 ALUPP was in use until a new ALUPP was adopted in 1986. This ALUCP replaces the ALUPP adopted by the ALUC in 1986.

Section 21675(a) of the California Public Utilities Code (PUC) states that the ALUC shall review land use compatibility plans as often as necessary in order to accomplish its purposes, but shall not be amend those plans more than once in any calendar year.

The ALUC is appointed as follows:

- Two commissioners representing the County, appointed by board of supervisors.
- Two commissioners representing cities in the County, appointed by a committee of all mayors, except that at least one representative must be appointed from among "any cities contiguous or adjacent to the qualifying airport" (i.e., an airport served by a scheduled airline or one operated for the benefit of the general public).
- Two commissioners with expertise in aviation, appointed by a committee of the managers of all public airports within the County.
- One commissioner representing the general public, appointed by the other six members of the commission.

Each member of the ALUC appoints a proxy to serve as a representative and to vote when the member is absent. Proxies serve at the pleasure of the appointing member of the ALUC. The proxy must be in writing and filed at the ALUC office. The term of office on the ALUC is four years. Any member can be removed at any time and without cause by the appointing body (California PUC Section 21671.5(a)).

In accordance with adopted bylaws, public meetings are held on the third Wednesday of each month.

1.1.4 Relationship of the ALUC to County and City Governments

The relationship between the Alameda County ALUC and County government, the City of Oakland, the City of San Leandro, the City of Hayward, the City of Alameda, and any future jurisdiction affected by this document is determined by the State Aeronautics Act. On one level, the ALUC does not need the approval of the County or any affected jurisdiction to adopt this ALUCP or to carry out its project review duties. However, despite its independent nature, the ALUC must still coordinate its activities with local land use jurisdictions on several matters:

- An ALUC must provide for a coordinated review in regards to the establishment of an airport influence area (AIA) boundary is considered mandatory, as state law requires that a "hearing and consultation with involved agencies" occurs (PUC Section 21675(c)).

- Once local agencies have revised their general or specific plans or overruled the ALUC, the proposed action of the local agency is not subject to further commission review, "unless the commission and the local agency agree that individual projects shall be reviewed by the commission" (Section 21676.5(b)).

- Once an ALUC has adopted a compatibility plan, the authority and responsibility for enforcing its compatibility policies lies fully with the affected jurisdictions.

1.2 Policy Framework

The policies set forth in Chapters 2 and 3 of this document are based upon four primary sources: state laws and guidelines; the *Oakland International Airport Master Plan*; OAK's airport layout plan (ALP); and the policies of affected local agencies with regard to land use, which can be found in general and specific plans as well as zoning ordinances.

1.2.1 State Laws and Guidelines

Most of the revisions that have been made to the state laws governing ALUCs over the last thirty years involve the procedures by which ALUCs operate. The most significant among the amendments to the state law (adopted in 1982) was the requirement for local general and specific plans to be made consistent with the ALUCP. This amendment also limited the authority of the ALUC to review individual development proposals and reduced the vote requirement for a local jurisdiction to override an ALUC decision from four fifths to two thirds.

While many of the procedures that govern how ALUCs operate are defined by state law, with respect to the creation of airport land use compatibility criteria, very little is written in the statutes. Instead, a portion of the law enacted in 1994 makes reference to another guiding document, the *California Airport Land Use Planning Handbook*, published by the California Division of Aeronautics. While the *Handbook* does not constitute official state policy, the statutes say that when preparing compatibility plans for airports, ALUCs shall "be guided by" this resource. The policies and maps in this plan reflect the guidance provided by the current edition of the *California Airport Land Use Planning Handbook*, dated January 2002[2].

[2] The January 2002 edition of the Handbook can be downloaded from the Division of Aeronautics website at www.dot.ca.gov/hq/planning/aeronaut.

1.2.2 Relationship to Airport Master Plan

ALUCPs are distinct from airport master plans in function and content: Airport master plans address on-airport uses and facilities, whereas ALUCPs address the compatibility of off-airport land uses. An airport master plan, which is prepared for and adopted by the entity that owns and operates the airport, assesses the demand for airport facilities and guides the development necessary to meet those demands. An ALUCP, which is prepared and adopted by an ALUC, is intended to ensure that incompatible development does not occur on land surrounding the airport as identified by the AIA.

Section 21675(a) of the California Public Utilities Code requires that an ALUCP be based on the applicable airport master plan(s). The master plan for OAK was adopted by the Board of Port Commissioners in 2006.

The ALUCP should be consistent with airport goals, insofar as these goals conform to regional planning policies, and take into account environmental impacts. State law provides that, before modification of an airport master plan, the public agency owning the airport must submit the proposed change to the ALUC for a finding of consistency with the ALUCP. The ALUC will follow the same procedures used for review of city or County actions. The public agency may override the ALUC with a two-thirds vote of its governing body, if it makes specific findings that the proposed action is consistent with the purposes of the state ALUC law.

1.3 Plan Implementation

1.3.1 General Plan Consistency

State law requires local general plans and applicable specific plans to be consistent with the ALUCP. In the event that the ALUCP is amended, the law requires the local public agency to amend its general or specific plan within 180 days to be consistent with the revised ALUCP (Government Code, Section 65302.3). In the event that the local public agency does not concur with a provision of the ALUCP, the public agency may override the ALUC by a two-thirds vote after first holding a public hearing and making findings that the general plan of the local jurisdiction is consistent with the intent of state law.

To be consistent with an ALUCP, a general plan must specifically address compatibility planning issues and must avoid direct conflicts with compatibility planning criteria. Consistency implies that "the concepts, standards, physical characteristics, and resulting consequences of a proposed action must not conflict with the intent of the law of the compatibility plan to which the comparison is being made" (Caltrans, 2002). The *Handbook* identifies the following methods for compatibility planning issues to be reflected in a general plan:

- Incorporate Policies into Existing General Plan Elements. This method requires the incorporation of all airport land use compatibility measures into appropriate general plan elements. For example, noise compatibility measures may be incorporated into the city's

or county's general plan noise element. With this approach, direct conflicts between the ALUCP and general plan are eliminated and compliance mechanisms are fully incorporated into the local jurisdiction's general plan.

- Adopt a General Plan Airport Element. This format may be appropriate when a city's or county's general plan also needs to address on-airport development or operational issues. Modification of other general plan elements may still be necessary to eliminate conflicts and provide cross-referencing.

- Adopt the ALUCP as a Stand-Alone Document. A city or county can adopt the ALUCP, and changes to the city's or county's general plan would be minimal. Policy reference to the separate ALUCP would need to be added to the general plan, and any direct land use or other conflicts with compatibility planning criteria would have to be removed. The compatibility policies would substantially appear only in the stand-alone compatibility plan.

- Implement Compatibility Policies through Zoning. Adoption of an airport combining district or overlay zoning ordinance by a local government is a way of codifying airport compatibility criteria described only conceptually in the ALUCP. A combining district can supplement local land use designations by adding specific noise and/or safety criteria applicable to future development in the airport influence area. Policy reference to airport compatibility in the general plan could be as simple as stating support of the ALUCP and that policy implementation is by means of the combining zone.

1.3.2 Project Referrals

Counties and cities are obligated by state law to submit land use actions and other actions such as zoning ordinances and building regulations for the ALUC's review. In addition to the types of land use actions for which referral to the ALUC is mandatory in accordance with state law, the ALUCP specifies other land use projects that either must or should be submitted for review. These major land use actions are defined in Section 2.6.3 of this ALUCP.

1.4 Plan Contents

The ALUC is concerned with airport activities that may adversely affect nearby land uses within the AIA. The most significant airport-related concerns are:

- Exposure of persons on the ground to accident potential;

- Prevention of obstructions to air navigation (tall objects; objects in safety zones); and

- Prevention of hazards to flight such as wildlife hazards, smoke, flare, lighting, electrical interference, magnetic and radio interference, and thermal plumes.

For each concern, the ALUC has adopted land use compatibility policies in Chapters 2 and 3 of the ALUCP; these policies address existing and future conditions at OAK and its environs.

This ALUCP is organized as follows:

Chapter 2: Chapter 2 of this ALUCP presents the airport compatibility and review policies that are applicable throughout Alameda County.

Chapter 3: Chapter 3 of this ALUCP Update presents compatibility and review policies and maps specific to Oakland International Airport.

Chapter 4: Chapter 4 of this ALUCP Update provides background data for Oakland International Airport and its environs.

Chapter 5: Chapter 5 provides references for the data presented in this ALUCP.

Appendix A – H: present supplemental data and source documents that were used to develop the ALUCP.

CHAPTER 2
County-wide Policies

2.1 Introduction

The policies set forth in Chapters 2 and 3 of the *Oakland International Airport Land Use Compatibility Plan* serve two functions:

1. To articulate the procedures to be used by the Alameda County Airport Land Use Commission (ALUC) and affected local agencies for the purpose of performing airport land use compatibility review as required in the California State Aeronautics Act (Public Utilities Code Section 21670 *et seq*.).

2. To identify the compatibility criteria that the ALUC shall use in the review of projects involving land use development within the Oakland International Airport (OAK) airport influence area (AIA), including Airport master plans and other development plans for OAK. Similarly, local agencies and any future jurisdictions that may be affected by this document shall use this airport land use compatibility plan (ALUCP) to modify their respective general or specific plans and zoning ordinances for consistency with this ALUCP.

While the policies presented in this chapter specifically address ALUC review procedures and county-wide compatibility considerations, compatibility criteria and other policies specifically designed for OAK are presented in Chapter 3.

2.2 ALUCP Lifecycle

According to State law, the ALUCP should be based on a long-range plan that reflects the anticipated growth of the airport for at least 20 years. This timeframe is a general guideline, as the ALUCP contains various components of differing life spans. Among the components hardest to estimate are future noise levels near an airport because of uncertainties associated with the level of operations and changes in fleet mix, etc. Therefore, periodic adjustment of the ALUCP can be expected in order to reflect changes in anticipated airport impacts, revisions in state and federal law and regulations, and new experience gained concerning the suitability of guidelines set by the ALUC.

2.3 Effective Date

The policies presented in this ALUCP shall become effective for OAK on the date that the Alameda County ALUC adopts the plan. Until that time, the policies set forth in the 1986 *Alameda County Airport Land Use Policy Plan (ALUPP)* shall remain in effect. Should this ALUCP be invalidated in its entirety by a court action, the 1986 ALUPP shall become effective. Additionally, any action to invalidate the compatibility plan associated with another public-use airport in the County shall not invalidate this ALUCP.

2.4 Definitions

Definitions of terms for the purposes of the policies set forth in this document are as follows (Caltrans, 2002). Additional definitions are found in the *Glossary*.

Aeronautics Act: Sections 21670 *et seq*. of the California Public Utilities Code.

Airport: An area of land or water that is used or intended to be used for the landing and taking off of aircraft, including its buildings and facilities.

Airport Influence Area (AIA): The area in which current or future airport-related noise, overflight, safety, and/or airspace protection factors may significantly affect land uses or necessitate restrictions on those uses. In most circumstances, the airport influence area is designated by the ALUC as its *planning area boundary* for the airport and the two terms can be considered synonymous.

Airport Land Use Commission (ALUC): A commission authorized under the provisions of the California Public Utilities Code, Sections 21670 *et seq*. and established (in any county within which a public-use airport is located) for the purpose of promoting compatibility between airports and the land uses surrounding them.

Airport Land Use Compatibility Plan (ALUCP): As used herein, a plan, usually adopted by an ALUC, which sets forth policies for promoting compatibility between airports and the land uses which surround them. This document is sometimes referred to as an *Airport Land Use Policy Plan (ALUPP)*.

Aviation-Related Use: Any facility or activity directly associated with the air transportation of persons or cargo or the operation, storage, or maintenance of aircraft at an airport or heliport. Such uses specifically include runways, taxiways, and their associated protected areas defined by the Federal Aviation Administration (FAA), together with aircraft aprons, hangars, fixed base operations facilities, terminal buildings, etc.

Avigation Easement: A type of easement that typically conveys the following rights:

a) A right-of-way for free and unobstructed passage of aircraft through the airspace over the property at any altitude above a surface specified in the easement (usually set in accordance with the FAR Part 77 criteria).

b) A right to subject the property to noise, vibrations, fumes, dust, and fuel particle emissions associated with normal airport activity.

c) A right to prohibit the erection or growth of any structure, tree, or other object that would enter the acquired airspace.

d) A right-of-entry onto the property, with proper advance notice, for the purpose of removing, marking, or lighting any structure or other object that enters the acquired airspace.

e) A right to prohibit electrical interference, glare, misleading lights, visual impairments, wildlife hazards, or other hazards to aircraft flight from being created on the property.

Community Noise Equivalent Level (CNEL): The noise metric adopted by the State of California for evaluating airport noise. It represents the average noise level during a 24-hour day, adjusted to an equivalent level to account for the lower tolerance of people to noise during evening and nighttime periods relative to the daytime period.

Compatibility Zone: Any of the airport influence area zones set forth in this ALUCP for the purposes of determining land use compatibility.

Existing Land Use: A land use that either physically exists or else for which government approvals have been obtained through one or more of the following:

a) A valid building permit has been issued;

b) A development agreement that has been approved and vests site-specific land uses, plans, and intensities;

c) A tentative parcel or subdivision map has been approved and the original period, excluding extensions, within which the approval is valid and has not expired;

d) A vesting tentative parcel or subdivision map has been approved;

e) A final subdivision map has been recorded; or

f) A use permit or other discretionary entitlement has been approved and not yet expired.

Federal Aviation Regulations (FAR) Part 77: The part of the Federal Aviation Regulations that addresses objects affecting navigable airspace.

Height Review Overlay Zone: The area around an airport where the ground lies above a FAR Part 77 plane or less than 35 feet beneath a FAR Part 77 plane.

Helipad: A small, designated area, usually with a prepared surface, on a heliport, airport, landing / takeoff area, apron / ramp, or movement area used for takeoff, landing, or parking of helicopters.

Heliport: A facility used for operating, basing, housing, and maintaining helicopters.

Infill: Development that takes place on vacant property largely surrounded by existing development, especially development that is similar in character.

Local Jurisdiction: Alameda County or any city or other government agency (excluding state and federal agencies) having jurisdiction over land uses within its boundaries.

Nonconforming Use: An existing land use that does not conform to subsequently adopted or amended zoning or other land use development standards.

Project (Land Use Action, Development Proposal): Any proposed action under consideration by a local public agency or airport operator that is subject to ALUC review. Under State Law, such actions include amendment of a general or specific plan or adoption of a zoning ordinance or building regulation by a local public agency that affects land use within an AIA. It includes plans for proposed new airports or heliports and modification of an airport master plan by the airport owner. As specified by State Law, under certain circumstances a project may include other proposed local agency actions, regulations, or permits.

2.5 Geographic Scope

2.5.1 Airport Influence Area

The airport influence area (AIA), also known as the airport referral area, is the area in which current or future airport-related noise, overflight, safety, and/or airspace protection factors may significantly affect land uses or necessitate restrictions on those uses, as well as lands on which the uses could negatively affect the airport(s) in question.

The specific limits of the AIA of Oakland International Airport are presented in Chapter 3. For a discussion of noise, height, and safety impacts and how those issues affect the areas in which this ALUCP applies, see Appendix B, "Airport Land Use Compatibility Concepts".

2.5.2 County-wide Impacts on Flight Safety

Other lands, regardless of their location in the County, on which certain land use characteristics could adversely affect the safety of flight in the County, are included in this ALUCP. Specifically, any proposal for construction of any structure (including antennas) in the County that rises 200 feet above the ground level at the site is included in this ALUCP.

2.5.3 New Airports

The site and environs of any new airport that may be proposed anywhere in the County, including incorporated cities, and which requires an Airport Permit from the California Department of Transportation (Caltrans) Aeronautics Division are included in this ALUCP.

2.5.4 Heliports and Helipads

This ALUCP applies to any site and environs of any existing or proposed public-use, private-use, or special-use heliport or helipad (as defined by Caltrans) in the County, including incorporated cities that are included in this ALUCP (see Table 2-1 for list of existing heliports).

TABLE 2-1
HELIPORTS IN ALAMEDA COUNTY

Heliport Name	Location	Public/Private	Number of daily operations	Number of Night Operations (10:00PM to 7:00 AM)	Years of Operation	Miscellaneous
Alameda County, Alco Park	1221 Oak St. Oakland, CA 94607	Private	N/A	N/A	42	Last Inspected July 5, 1990
ACFD, Station 14	11345 Sunol Blvd. Sunol, CA 94586	Public	N/A	N/A	N/A	N/A
Camp Park Military Reservation	Dublin, CA	Public	N/A	N/A	N/A	N/A
Children's Hospital, Oakland	747 52nd St. Oakland, CA 94609	Private	Variable*	Variable*	8	Last Inspected December 17, 2003
Eden Medical Center	20103 Lake Chabot Rd. Castro Valley, CA 94546	Private	Variable*	Variable*	11	Last Inspected September 9, 2004
Fairview Site	27218 Fairview Ave., Fairview, CA 94542	Private	N/A	N/A	N/A	N/A
First Interstate Bank OPS	3440 Walnut Ave. Fremont, CA 94538	Private	N/A	N/A	24	Last Inspected May 25, 1990
Hacienda Business Park	4309 Hacienda Dr. Pleasanton, CA 94566	Private	N/A	N/A	21	Last Inspected January 31, 1990
Little Valley Site	Sunol, CA	Private	N/A	N/A	N/A	N/A
Ruby Hills Site	Pleasanton, CA	Private	N/A	N/A	N/A	No longer in use
Saint Rose Hospital	27200 Calaroga Ave. Hayward, CA 94545	Private	Variable*	Variable*	38	Last Inspected May 9, 2001
Valleycare Medical Center	5555 W. Las Positas Blvd. Pleasanton, CA 94588	Private	Variable*	Variable*	18	Last Inspected June 6, 2003
Washington Hospital	Corner of Bart Way and Civic Center Dr.	Private	Variable*	Variable*	N/A	N/A

* Variable - Heliport use at hospital locations based upon need.
N/A = Not available

Source: Alameda County, 2007.

FAA Advisory Circular (AC) 150/5390-2B, "Heliport Design," provides recommendations for heliport design and describes the federal requirements associated with heliport development. Alameda County encourages those with heliport proposals to implement the guidance set forth in the AC to the greatest extent practicable. The complete AC is available online in several files that can be downloaded upon request from the FAA website at: www.faa.gov. For more information pertaining to this FAA guidance, please refer to Appendix G, "Heliport Design." For heliport permitting requirements, contact Caltrans' Division of Aeronautics. Also see Section 2.7.4 for ALUC review criteria for new heliports, or heliport master/development plans.

2.6 Scope of ALUC Review

As specified by the State Aeronautics Act and described in the *Handbook*, review of local actions pertaining to airport land use compatibility is one of the fundamental reasons for the formation of ALUCs. Plans that undergo mandatory review by ALUCs prior to their adoption include general and specific plans and ordinances prepared by local jurisdictions (see Sections 2.6.1 and 2.6.2), as well as airport and heliport plans, including master plans, expansion plans, and plans for the construction of new facilities. Other types of actions proposed within the AIA that have the potential to affect land use or airport operations should also be reviewed by the ALUC for a determination of consistency with this ALUCP (see Section 2.6.2.).

2.6.1 Actions Requiring ALUC Review

2.6.1.1 Land Use Plans and Zoning Ordinances

As noted in the *Handbook*, The following plans or ordinances shall be reviewed by the ALUC for determination of consistency with the ALUCP prior to their approval by the local jurisdiction:

a) The adoption or approval of any amendment to a general or specific plan affecting property within an AIA (California Public Utilities Code Section 21676(b)).

    1) Until such time as the ALUC finds that a local jurisdiction's general plan or specific plan is consistent with the ALUCP, or the local jurisdiction has overruled the ALUC's determination of inconsistency by a two-thirds vote of its governing body, the local jurisdiction shall refer all actions, regulations, and permits involving land within an AIA to the ALUC for review (California Public Utilities Code 21676.5(a)). Only those actions that the ALUC elects not to review are exempt from this requirement.

    2) After a local jurisdiction has revised its general plan or specific plan for consistency with the ALUCP or has overruled the ALUC by a two-thirds vote of its governing body, the ALUC no longer has authority under state law to require that all actions, regulations, and permits be referred for review. However, the ALUC and the local agency can agree that the ALUC should continue to review individual projects in an advisory capacity.

i. The ALUC requests local jurisdictions to continue to submit major land use actions as listed in Section 2.6.2.

ii. Review of these actions is requested only if a review has not previously been conducted as part of a general plan, specific plan, or zoning ordinance action or if sufficient project-level detail to enable a full assessment of compatibility was not available at the time of a previous review.

iii. Because the ALUC is acting in an advisory capacity when reviewing projects under these circumstances, local jurisdictions are not required to adhere to the override process if they elect to approve a project without incorporating design changes or conditions suggested by the ALUC.

b) The adoption or approval of a zoning ordinance or building regulation which (1) affects property within an AIA, and (2) involves any of the airport-related concerns listed in Section 1.4 of this ALUCP (California Public Utilities Code Section 21676(b)). Any proposed change or variance to any such ordinance or regulation also must be submitted for ALUC review if issues of noise, safety, airspace protection, and overflight are involved.

c) Proposed redevelopment of a property within an AIA for which the existing use is consistent with the local general plan and/or specific plan, but does not conform to the compatibility criteria set forth in this ALUCP.

d) Proposed land use actions covered by Sections 2.6.1(a), 2.6.1(b), and 2.6.1(c) shall initially be reviewed by the ALUC Administrative Officer or her or his designee. If the ALUC Administrative Officer determines that significant compatibility issues are evident, the proposal shall be forwarded to the ALUC for review and decision. The ALUC authorizes the ALUC Administrative Officer to approve proposed actions having no apparent compatibility issues.

2.6.1.2 Airport and Heliport Plans

The following types of actions shall be referred to the ALUC for determination of consistency with the ALUCP prior to their approval by the local jurisdiction:

a) The adoption or modification of the master plan for an existing public-use airport (California Public Utilities Code Section 21676(c)).

b) Any proposal for expansion of an existing airport or heliport not included in that airport or heliports approved master plan if such expansion will require an amended airport permit from the state of California (California Public Utilities Code 21664.5).

c) Any proposal for a new airport, heliport, or helipad whether, for public use or private use (California Public Utilities Code Section 21661.5), if the facility requires a State Airport Permit.

2.6.2 Land Use Actions Recommended for ALUC Review

Although the ALUC does not have the authority under state law to require that all actions, regulations, and permits be referred for review, the ALUC requests that certain types of actions be referred to the ALUC for determination of consistency with the ALUCP prior to their approval by the local jurisdiction.

For example, the scope or character of certain proposed major land use actions, as listed below, is such that their compatibility with airport activity may be cause for concern. Even though these actions may be generally consistent with the local general plan or specific plan, sufficient detail may not be known to enable a full airport compatibility evaluation at the time that the general plan or specific plan is reviewed. To enable better assessment of compliance with the compatibility criteria set forth herein, ALUC review of these actions may be warranted.

a) Any proposed expansion of the sphere of influence or boundary of a city or special district that would extend into the AIA.

b) Proposed pre-zoning of property within the AIA associated with future annexation of land to a city.

c) Proposed residential development within the AIA, including land divisions, consisting of five or more dwelling units or parcels.

d) Any discretionary development proposal within the AIA for projects having a building floor area of 20,000 square feet or greater.

e) Proposed land acquisition within the AIA by a government or private entity for any facility that would act as an indoor or outdoor assembly area for a large number of people (i.e., meeting halls, parks, correctional institutions, sport facilities, etc.).

f) Any obstruction reviewed by the FAA in accordance with FAR Part 77 that receives a finding other than "not a hazard to air navigation."

g) Any industrial use within the AIA having the potential to interfere with, or create hazards to aircraft in flight including, but not limited to:
    1) Electrical or other interference with radio communications or navigational signals;
    2) Lighting which could be mistaken for airport lighting;
    3) Thermal plumes;
    4) Glare in the eyes of pilots or aircraft using the airport; or
    5) Impaired visibility near the airport from smoke or steam.

h) Other nonresidential development including, but not limited to:
    1) Institutional uses (schools, prisons);

2) Utility uses (utility poles, electrical substations, water supply and treatment facilities, and power plants);

3) Healthcare uses (hospitals, respite facilities); and

4) Open spaces (parks, golf courses, agricultural areas, wildlife refuges, or other forms of land use that could serve as habitat for potentially hazardous wildlife).

i) Projects within the AIA with the potential to attract an increased number of birds to the vicinity of an airport, such as those with large water features, ponds, etc.

j) Proposed non-aviation development of airport property if such development has not previously been included in an airport master plan or community general plan reviewed by the ALUC. (See Section 2.4 for definition of aviation-related use.)

k) Regardless of location within Alameda County, any proposal for construction or alteration of a structure (including antennas) taller than 200 feet above the ground level at the site. (Such structures also require notification to the Federal Aviation Administration in accordance with Federal Aviation Regulations, Part 77, Paragraph 77.13(a)(1).)

l) Any other proposed land use action, as determined by the local planning agency, involving a question of compatibility with airport activities.

2.7 Review Process

2.7.1 General

Proposed actions listed in Section 2.6.2 should be referred to the ALUC as early as possible so that the ALUC's review can be duly considered by the local jurisdiction prior to formalizing its actions. Though the timing may vary, all projects must be submitted to the ALUC for review prior to final approval by the local jurisdiction.

2.7.2 Public Noticing

Where applicable, the ALUC shall provide public notice and obtain public input in accordance with the California Public Utilities Code (PUC Section 21675.2(d)) and general plan law (Government Code, Section 65090) before action on any plan, regulation, or other land use proposal under consideration.

2.7.3 Review Process for Land Use Plans and Zoning Ordinances

2.7.3.1 Initial Review of General Plan Consistency

In conjunction with adoption of this ALUCP, the ALUC shall review the general plans, specific plans, and zoning ordinances of affected local jurisdictions to determine their consistency with the ALUCP.

a) Within 180 days of the ALUC's adoption or amendment of the ALUCP, each local jurisdiction must amend its general plan and any applicable specific plan to be consistent with the ALUCP or, alternatively, adopt findings and override the ALUC in accordance with Section 21676(b) of the Public Utilities Code (Government Code Section 65302.2).

b) Prior to taking action on a proposed amendment to a general plan or specific plan, the local jurisdiction must submit a draft of the proposal to the ALUC for review and approval in accordance with Section 21676(b) of the Public Utilities Code.

c) In conjunction with its submittal of a general plan or specific plan amendment to the ALUC, a local jurisdiction may request that the ALUC modify the areas defined as "infill" in accordance with Section 2.7.6.7 (a). The ALUC will include a determination on the infill as part of its action on the consistency of the general plan and specific plans.

d) After a local jurisdiction has revised its general plan or specific plan for consistency with the ALUCP, subsequent land use proposals within the AIA (which are consistent with the applicable general plan, specific plans, and zoning ordinances) are subject to ALUC review only under the conditions indicated in Sections 2.6.1 and 2.6.2.

2.7.3.2 ALUC Action Alternatives

When reviewing a general plan, specific plan, zoning ordinance, or building regulation for consistency with the ALUCP, the ALUC has three choices of action:

a) Find the plan, ordinance, or regulation consistent with the ALUCP. To make such a finding with regard to a general plan, the conditions identified in Section 2.7.5.2 must be met.

b) Find the plan, ordinance, or regulation consistent with the ALUCP, subject to conditions and/or modifications that the ALUC may require.

c) Find the plan, ordinance, or regulation inconsistent with the ALUCP. In making a finding of inconsistency, the ALUC shall note the specific conflicts upon which its determination is based.

2.7.3.3 Response Time

The ALUC must respond to a local jurisdiction's request for a consistency determination on a general plan, specific plan, zoning ordinance, or building regulation within 60 days from the date of referral (California Public Utilities Code Section 21676(d)).

a) If the ALUC fails to make a determination within that period within that period, the proposed action shall be deemed consistent with the ALUCP.

b) Regardless of ALUC action or failure to act, the proposed action must comply with other applicable local, state, and federal regulations and laws.

c) The referring agency shall be notified of the ALUC's action in writing.

2.7.3.4 Review Criteria

In order for a general or specific plan, or a zoning ordinance to be considered consistent with the ALUCP, both of the following must be accomplished:

a) No direct conflicts can exist between the two plans. Direct conflicts primarily involve general plan land use designations which do not meet the density or intensity criteria specified in the ALUCP although conflicts with regard to other policies also may exist. Note, however, that a general plan cannot be found inconsistent with the ALUCP because of land use designations that reflect existing land uses even if those designations conflict with the ALUC's compatibility criteria. Because ALUCs have no authority over existing land uses, general plan land use designations that merely reflect the existing uses for such parcels are, in effect, excluded from requirements for general plan consistency with the ALUC plan. This exception is applicable only if the general plan includes policies setting limitations on expansion and reconstruction of nonconforming uses consistent with Section 2.7.5.7.

b) Provisions must be made for evaluation of proposed land use development situated within an AIA relative to the compatibility criteria set forth in the ALUCP.

    1) Even if the land use designations in a general plan have been deemed consistent with the ALUCP, evaluation of the proposed development relative to the land use designations alone is usually insufficient. General plans typically do not contain the detailed airport land use compatibility criteria necessary for a complete compatibility evaluation of proposed development.

    2) Local jurisdictions have the following choices, or a combination thereof, for satisfying this evaluation requirement:

        i. The general plan and/or referenced implementing ordinances and regulations must contain sufficient detail to enable the local jurisdiction to assess whether a proposed development fully meets the compatibility criteria specified in the ALUCP (this requires both that the compatibility criteria be identified and that project review procedures be described);

ii. The ALUCP must be adopted by reference (additionally, the project review procedure must be described in a separate instrument presented to and approved by the ALUC); and/or

iii. The general plan must indicate that all major land use actions, as listed in Section 2.6.2 or otherwise agreed to by the ALUC, shall be referred to the ALUC for review in accordance with the policies of Section 2.7.5.

3) The status of ALUC review of major land use actions depends upon which of the preceding options the local jurisdiction selects for making its general plan consistent with the ALUCP. This status, in turn, affects whether a local jurisdiction would be required to use the override process in the event of a disagreement with the ALUC's action.

If either of the first two options listed in Section 2.7.3.4(b)(2) is selected, then referral of major land use actions to the ALUC is voluntary. In this case, the ALUC's review is advisory and the local jurisdiction would not need to use the override process if it elects to approve a project without incorporating the ALUC's comments.

If the third option listed in Section 2.7.3.4(b)(2) is selected, submittal of major land use actions for ALUC review is mandatory and override procedures would apply.

2.7.4 Review Process for Airport and Heliport Actions

2.7.4.1 Project Submittal Information

Any proposal for a new airport, heliport, helipad, or an airport or heliport master or development plan, submitted to the ALUC for review shall contain sufficient information to enable the ALUC to adequately assess the noise, overflight, safety, and airspace protection impacts of airport activity upon surrounding land uses.

a) At a minimum, information to be submitted shall include:

1) A layout plan drawing of the facility showing the location of:

i. Property boundaries;

ii. Runways or helicopter takeoff and landing areas;

iii. Runway or helipad protection zones; and

iv. Aircraft or helicopter approach/departure flight routes.

2) Airspace surfaces in accordance with FAR, Part 77.

3) Activity forecasts, including the number of operations by each type of aircraft proposed to use the airport, the percentage of day, evening, and night operations, and the distribution of takeoffs and landings for each runway direction.

4) Proposed flight track locations and projected noise contours or other relevant noise impact data.

5) A map showing existing and planned land uses in the areas affected by aircraft or helicopter activity associated with implementation of the proposed master plan or development plan.

6) Any environmental document (initial study, draft environmental impact report, etc.) that has been prepared for the project.

7) Identification and proposed mitigation of impacts on surrounding land uses.

b) Any applicable review fees as established by the ALUC shall accompany the application.

2.7.4.2 ALUC Action Alternatives for Reviews of New Airports and Heliports

When reviewing proposals for new airports or heliports, the ALUC's choices of action are:

a) Approve the proposal as being consistent with the specific review policies listed in Section 2.7.5.4.

b) Approve the proposal and adopt an ALUCP for that facility. State law requires adoption of such a plan if the airport or heliport will be a public-use facility (California Public Utilities Code Section 21675(a)).

c) Disapprove the proposal on the basis that the noise, safety, airspace protection, and overflight impacts it would have on surrounding land uses are not adequately mitigated.

2.7.4.3 ALUC Action Choices for Plans of Existing Airports or Heliports

When reviewing airport master plans or expansion plans for existing airports, the ALUC has three action choices:

a) Find the airport or heliport plan consistent with the ALUCP.

b) Find the airport or heliport plan inconsistent with the ALUCP.

c) Modify the ALUCP (after duly noticed public hearing) to reflect the assumptions and proposals in the airport or heliport plan.

2.7.4.4 Response Time

The ALUC must respond to a local jurisdiction's submittal of plans for a new airport or heliport, or an airport/heliport master or development plan, within 60 days from the date of referral (California Public Utilities Code Section 21676(d)).

a) If the ALUC fails to make a determination within that period, the proposed action shall be deemed consistent with the ALUCP.

b) Regardless of ALUC action or failure to act, the proposed action must comply with other applicable local, state, and federal regulations and laws.

c) The referring agency shall be notified of the ALUC's action in writing.

2.7.4.5 Review Criteria for New Airports or Heliports

In reviewing proposals for new airports and heliports, the ALUC shall focus on the potential noise, overflight, safety, and airspace protection impacts upon surrounding land uses. The review should examine the kinds of impacts that these factors would have upon both existing and planned land uses. Items to be considered should include:

a) Whether the existing or planned land uses would be considered incompatible with the airport or heliport if the latter were already in existence.

b) The measures provided in the development plan to mitigate the effects of noise, safety, height restriction, and overflight impacts on surrounding land uses, such as:

    1) Locating flight tracks so as to minimize the impacts;

    2) Other operational procedures to minimize impacts; and

    3) Acquisition or property interests (fee title or easements) on the impacted land.

c) The ALUC shall evaluate the adequacy of the proposed facility design (in terms of federal and state standards) only to the extent that the design affects surrounding land use. The ALUC does not have the authority to make a determination of conformance with federal and state standards.

d) The ALUC must base its review on the proposed airfield or heliport design. The ALUC does not have the authority to require alterations to the airfield or heliport design.

e) The review shall examine the relationships between existing and planned land uses in the vicinity of the proposed airport or heliport and the impacts that the proposed facility would have upon these land uses.

f) Other types of environmental impacts (e.g., air quality, water quality, natural habitats, vehicle traffic, etc.) are not within the scope of ALUC review.

2.7.4.6 Review Criteria for Airport Master, Layout, and Development Plans

When reviewing new or modified airport master or development plans for existing airports, the ALUC shall determine whether activity forecasts or proposed facility development identified in

the plan differ from the forecasts and development assumed for that airport in this ALUCP. Attention should specifically focus on:

a) Activity forecasts that:

    1) Are significantly higher than those in the ALUCP; or

    2) Include a higher proportion of larger or noisier aircraft.

b) Proposals to:

    1) Construct a new runway or helicopter takeoff and landing area;

    2) Permanently change the length, width, or landing threshold location of an existing runway; or

    3) Establish an instrument approach procedure.

2.7.4.7 Consistency Determination Criteria for Master or Development Plans

The ALUC shall determine whether the proposed master plan or development plan is consistent with the ALUCP. The ALUC shall base its determination of consistency on:

a) Findings that the forecasts and aviation-related development identified in the master or development plan would not result in greater noise, overflight, or safety impacts or height restrictions on surrounding land uses than are assumed in the ALUCP.

b) A determination that any non-aviation development proposed within the airport or heliport boundary will be consistent with the basic compatibility criteria set forth in Table 2-3.

2.7.5 Review Process for Proposed Land Use Actions

2.7.5.1 Information Required for Review of a Proposed Individual Project

Project sponsors must provide information for ALUC review. Items (a) through (f) below are summarized in Table 2-2.

a) Indication, in writing, that the proposed local action is referred to the ALUC for mandatory review and comment.

b) Site maps to indicate the location of the proposed local action.

c) The identities of all property owners within the land area encompassed by the proposed local action, and, if any development or development application has been proposed to the referring jurisdiction or is known by the referring jurisdiction to be in preparation in conjunction with the local action, the identities of the applicant or applicants and of the representative(s) thereof.

d) A full description and map of the geographic area. The map and description must indicate:

1) The geographic area encompassed by the proposed local action;

2) The assessor's parcel number of all properties involved by the proposed local action;

3) The relationship of the proposed local action to the Airport;

4) The relationship of the proposed local action to the safety zones as defined by the ALUCP in force; and

5) The relationship of the proposed local action to airport noise contours, as defined by the ALUCP.

TABLE 2-2
INFORMATION REQUIRED FOR ALUC REVIEW OF PROPOSED LAND USE ACTIONS

	Local Actions*				
Information Required	**General Plan**	**Specific Plan**	**Zoning Ordinance**	**Building Regulation**	**Individual Project**
Indication (in writing) that the proposed local action is referred to the ALUC for mandatory review under the provisions of the State of California Public Utilities Code	Y	Y	Y	Y	N
Indication (in writing) that the proposed local action is referred to the ALUC for optional review and comment	N	N	N	N	Y
Full text of the proposed referring agency action	Y	Y	Y	Y	N/A
Site map of the proposed local action	N/A	N/A	N/A	N/A	Y
Map and written description including:					
▪ Geographic Area	Y	Y	Y	N/A	Y
▪ All parcel nos. associated with the proposed project	Y	Y	Y	N/A	Y
▪ Relationship of proposed action to the airport, safety zones, and noise contours	Y	Y	Y	N/A	Y
▪ Elevation of the proposed project action	Y	Y	Y	N/A	Y
A description of land uses, densities, and open space conservation for the proposed action	Y	Y	Y	N/A	N/A
A copy of any CEQA or NEPA document, noise study, or other environmental evaluation prepared in conjunction with the proposed action.	Y	Y	Y	N/A	Y
A written assurance that a real estate disclosure document will be provided for property offered for sale or lease within the AIA.	Y	Y	Y	N/A	Y

Abbreviations:

Y - Yes, information is required; **N** - No, information is not required; **N/A** - Not applicable

* This also includes amendments to general and specific plans.

e) A description of uses, land use densities, residential land use densities, and open space conservation proposed for the local action.

f) An analysis of the maximum elevation of improvements (i.e., site elevation plus height of improvements) that would be permissible under the terms and conditions of the proposed local action, and of the relationship of the maximum allowable elevation of improvements to the applicable imaginary airport surfaces as defined in Part 77 of the Federal Aviation Regulations and the minimum instrument approach altitudes, as specified by the U.S. Standards for Terminal Instrument Procedures of any instrument approaches that entail overflight of the property affected.[1]

g) A copy of any Initial Study, Environmental Impact Report, Environmental Assessment, Environmental Impact Statement, noise study, or other environmental evaluation prepared or required in conjunction with the proposed local action.

h) A written assurance that for residential property within the AIA offered for sale or lease the notice of intention filed with the Department of Real Estate shall include the following (as per the provisions of Business and Professional Code Section 11010 and Civil Code Sections 1102.6, 1103.4, and 1353):

   NOTICE OF AIRPORT IN VICINITY: This property is presently located in the vicinity of an airport, within what is known as an airport influence area. For that reason, the property may be subject to some of the annoyances or inconveniences associated with proximity to airport operations (for example: noise, vibration, or odors). Individual sensitivities to those annoyances can vary from person to person. You may wish to consider what airport annoyances, if any, are associated with the property before you complete your purchase and determine whether they are acceptable to you.

Failure to provide the ALUC with required information for any proposed local action shall constitute sufficient grounds for a determination of inconsistency.

2.7.5.2 ALUC Administrative Officer's Choices

The ALUC Administrative Officer, when reviewing major land use actions, has two choices of action:

a) Find that the proposed project does not contain characteristics likely to result in inconsistencies with the compatibility criteria set forth in this ALUCP. The ALUC Administrative Officer is authorized to approve such projects on behalf of the ALUC.

b) Find that the proposed project may be inconsistent with the ALUCP. The ALUC Administrative Officer shall forward any such project to the ALUC for a consistency determination.

[1] The U.S. Standards for Terminal Instrument Procedures (TERPS) are contained in FAA Order 8260.3B CHG 19 (5/12/02).

2.7.5.3 ALUC Action Alternatives

The ALUC has three choices of action when reviewing a major land use project proposal:

a) Find the project consistent with the ALUCP.

b) Find the project consistent with the ALUCP, subject to compliance with such conditions as the ALUC may require. Any such conditions should be limited in scope and be described in a manner which allows compliance to be clearly assessed (e.g., the height of a structure).

c) Find the project inconsistent with the ALUCP. In making a finding of inconsistency, the ALUC shall note the specific conflicts upon which its determination is based.

2.7.5.4 Response Time

State law does not specify a timeframe for ALUCs to review land use actions other than amendment of a general plan or specific plan or the addition or approval of a zoning ordinance or building regulation. Nevertheless, the policy of the Alameda County ALUC is that:

a) Reviews of projects forwarded to the ALUC Administrative Officer for a consistency determination shall be completed within 21 days following the submittal of a complete application. Should the project require further review, the Administrative Officer will forward the project to the ALUC, and will schedule a hearing within 60 days of project referral.

b) The date of referral is deemed to be the date on which all applicable project submittal information as listed in Section 2.7.5.1 is received by the ALUC Administrative Officer.

c) If the ALUC Administrative Officer or the ALUC fails to make a determination within the above time periods, the proposed action shall be deemed consistent with the ALUCP.

d) Regardless of action or failure to act on the part of the ALUC Administrative Officer or the ALUC, the proposed action still must comply with other applicable local, state, and federal regulations and laws.

e) The referring agency shall be notified of the ALUC Administrative Officer's and/or the ALUC's action in writing.

2.7.5.5 Subsequent Review

Once a project has been found consistent with the ALUCP, it need not be referred for review at subsequent stages of the planning process (e.g., for a use permit after a zoning change has been reviewed) unless:

a) Insufficient information was available at the time of the ALUC's original review of the project to assess whether the proposal would be fully in compliance with compatibility

criteria (e.g., the site layout and structure height might not be known at the time a general plan change or zoning amendment is requested).

b) The design of the project subsequently changes in a manner that could raise questions as to the validity of a previous finding of compatibility. Changes warranting review include, but are not limited to, the following:

    1) An increase in the number of dwelling units proposed for the site;

    2) A proposed increase in intensity of use (more people on the site);

    3) Incorporation of clustering or modifications to the configuration of open land areas proposed for the site; and/or

    4) A proposed increase in the height of structures or other design features.

c) The local jurisdiction concludes that further review is warranted.

d) The ALUC requests further review at a date later in the approval process.

2.7.5.6 Basic Land Use Compatibility Criteria

The basic compatibility criteria table (see Table 2-3) represents a compilation of compatibility criteria associated with noise, overflight, safety, and airspace protection impacts.

The basic criteria for assessing whether a land use plan, ordinance, or development proposal is to be judged compatible with a nearby airport are set forth in this table. Additional factors pertaining to the review of general plans shall also be taken into account.

TABLE 2-3
BASIC SAFETY COMPATIBILITY CRITERIA AND SUPPORTING INFORMATION

Zone	Location	Compatibility Qualities	Risk Factors / Runway Proximity
1	**Runway Protection Zone**	• Prohibit all structures except those with aeronautical functions • Prohibit residential land uses • Prohibit objects exceeding Part 77 height limits • Prohibit storage of hazardous materials • Avigation easement dedication	• Very high risk • Runway Protection Zone is defined by FAA criteria
2	**Inner Approach/Departure Zones**	• Prohibit schools, day care centers, libraries, hospitals, nursing homes, and places of worship • Prohibit highly noise-sensitive outdoor nonresidential uses • Prohibit above ground storage or hazardous materials4 • Prohibit other hazards to flight	• Substantial Risk • RPZs together with inner safety zones encompass 30% - 50% of near-airport aircraft accident sites (air carrier and general aviation) • Encompasses areas overflown at low altitudes (typically 200-400 feet above runway elevation)
3	**Inner Turning Zones**	• Prohibit critical infrastructure facilities • Limit residential uses to very low densities (if not deemed unacceptable because of noise) • Avoid non-residential uses having moderate or higher usage intensities (e.g., major shopping centers, fast food restaurants, theaters, meeting halls, buildings with more than three above ground floor are generally unacceptable.) • Prohibit children's schools, day care centers, hospitals, nursing homes • Avoid hazardous uses (e.g., aboveground bulk fuel storage)	• Zone primarily applicable to general aviation airports • Covers locations where aircraft are typically turning from the base to final approach legs of the standard traffic pattern and are descending from traffic pattern altitude • Zone also includes the area where departing aircraft normally complete the transition from takeoff power and flap settings to a climb mode and have begun to turn their en route heading
4	**Outer Approach/Departure Zones**	• In undeveloped areas, limit residential uses to very low densities (if not deemed unacceptable because of noise); if alternative uses are impractical, allow infill in urban areas • Prohibit children's schools, large day care centers, hospitals, nursing homes • Limit non-residential uses as in Zone 3.	• Situated along extended runway centerline beyond Zone 3 • Approaching aircraft usually at less than traffic pattern altitude • Partially applicable for busy general aviation runways (because of elongated traffic pattern), runways with straight in instrument approach procedures, and and other runways where straight-in or straight-out flight paths are common. • Zone can be reduced in size or eliminated for runways with very low activity levels.

TABLE 2-3
BASIC SAFETY COMPATIBILITY CRITERIA AND SUPPORTING INFORMATION

Zone	Location	Compatibility Qualities	Risk Factors / Runway Proximity
5	**Sideline Zones**	• Avoid residential uses • Allow all common aviation-related activities provided that height criteria is met • Limit other non-residential uses similarly to Zone 3, but with slightly higher usage intensities • Prohibit children's schools, large day care centers, hospitals, nursing homes	• Encompasses close-in area lateral to runways • Area not normally overflown; primary risk is with aircraft losing directional control on takeoff • Area is on airport property at most airports
6	**Traffic Pattern Zone**	• Allow residential uses • Allow non-residential uses; prohibit outdoor stadiums and similar uses with very high intensities • Avoid children's schools, large day care centers, hospitals, nursing homes	• Generally low likelihood of accident occurrence at most airports; risk concern primarily is with uses for which potential consequences are severe • Zone includes all other portions of regular traffic patters and pattern entry routes
7	**Other Airport Environs**	• Prohibit hazards to flight • Allow residential uses	• All areas outside Zones 1 through 6, but within AIA boundaries
*	**High Terrain**	• Same as underlying safety zone	

NOTES:
See Chapter 3 for airport-specific criteria, which may change or provide additions to these policies.

DEFINITIONS:
Allow: Use is acceptable.
Limit: Use is acceptable only if density/intensity restrictions are met.
Avoid: Use generally should not be permitted unless no feasible alternative is available.
Prohibit: Use should not be permitted under any circumstances.
Children's Schools: Through grade 12.
Large Day Care Centers: Commercial facilities as defined in accordance with state laws; for the purposes here, family day care homes and noncommercial facilities ancillary to a place of business are generally allowed.
Aboveground Bulk Storage of Fuel: Tank size greater than 6,000 gallons (this suggestion is based on the Uniform Fire Code criteria which are more stringent for larger tank sizes.

SOURCE:
Caltrans, *California Airport Land Use Planning Handbook,* January 2002, Table 9B.

REFERENCES:
The risk factors presented here are derived from the *California Airport Land Use Planning Handbook*, and are intended to demonstrate the need for the safety criteria provided in Chapters 2 and 3 of this ALUCP.
Height limits and the review of objects in airport airspace is determined under the guidelines of Federal Aviation Regulation (FAR) Part 77: *Objects Affecting Navigable Airspace*.
Hazards to flight would include tall objects, visual and electronic forms of interference, and land use development that would attract wildlife hazardous to aircraft operations.

For the purposes of reviewing proposed amendments to county or city land use plans and zoning ordinances, as well as in the review of most individual development proposals, the criteria in the summary table are anticipated to suffice. However, certain complex land use actions may require more intensive review. The ALUC may refer to the supporting criteria, as listed in Chapter 3, to clarify or supplement its review of such actions.

2.7.5.7 Special Conditions

a) Infill. Where development not in conformance with this ALUCP already exists, additional infill development of similar land uses may be allowed to occur even if such land uses are to be prohibited elsewhere in the AIA. The burden for demonstrating that a proposed development qualifies as infill rests with the project proponent and/or local jurisdiction

    1) A parcel can be considered for infill development if it meets all of the following criteria plus the applicable provisions of either Sections 2.7.5.7(a)(2) or 2.7.5.7(a)(3) below:

        i. The parcel size is 20 acres or less.

        ii. The site is at least 65% bound (disregarding roads) by existing uses that are similar to, or more intensive than, those proposed.

        iii. The proposed project would not extend the perimeter of the area defined by the surrounding, already developed, incompatible uses.

        iv. Further increases in the density, intensity, and/or other incompatible design or usage characteristics (e.g., through use permits, density transfers, addition of second units on the same parcel, height variances, or other strategy) are not included.

        v. The area to be developed cannot previously have been set aside as open land in accordance with open land policies presented in Chapter 3 of this ALUCP unless replacement open land is provided within the same compatibility zone.

    2) For residential development, the density of the parcel proposed for development shall not exceed the following:

        i. For parcels of 10 acres or less, the density shall not exceed the median density represented by all existing lots that lie fully or partially within a distance of 300 feet from the defined infill area.

        ii. If the size of the parcel is greater than 10 acres (but no larger than 20 acres), then the development density shall be no greater than double the density permitted in accordance with the basic compatibility criteria listed in Table 3-2.

3) For non-residential development:

   i. If the size of the parcel proposed for development is 10 acres or less, the usage intensity (the number of people per acre) of the proposed use shall be no greater than the average intensity of all existing uses that lie fully or partially within a distance of 300 feet from the boundary of the proposed development.

   ii. If the size of the parcel proposed for development is greater than 10 acres (but no larger than 20 acres), the proposed use shall not have an intensity (the number of people per acre) more than 50% above the intensity permitted in accordance with the basic compatibility criteria listed in Table 3-2.

4) In order for the ALUC to consider proposed development under these infill criteria, the local jurisdiction having land use authority (Alameda County or affected cities) must first identify the qualifying locations in its general plan or other adopted planning document that has been found consistent with the ALUCP by the ALUC. This action may take place in conjunction with the process of amending a general plan for consistency with the ALUC plan or may be submitted by the local jurisdiction
for consideration by the ALUC at the time of adoption of this ALUCP.

b) Nonconforming Uses. Uses that are not in conformance with this ALUCP may only be expanded as follows:

1) Nonconforming residential uses may be expanded in building size provided that the expansion does not result in more dwelling units than currently exist on the parcel.

2) A nonconforming nonresidential development may be continued, modified, transferred, or sold, provided that no such use shall be expanded in area or increased in intensity (the number of people per acre) above the levels existing at the time of adoption of this ALUCP.

3) Any proposed expansion of a nonconforming use (in terms of the number of dwelling units or people on the site) shall be subject to ALUC review. Factors to be considered in such reviews include whether the development qualifies as infill or warrants approval because of other special conditions.

c) Reconstruction. An existing nonconforming development that has been fully or partially destroyed as the result of a calamity may be rebuilt only under the following conditions:

1) Nonconforming residential uses may be rebuilt provided that the expansion does not result in more dwelling units than existed on the parcel at the time of the damage.

2) A nonconforming nonresidential development may be rebuilt, even if completely destroyed, provided that the reconstruction does not increase the floor area of the previous structure or result in an increased intensity of use (i.e., more people per acre).

3) Nothing in Sections 2.7.5.7(c)(1) through 2.7.5.7(c)(2) is intended to preclude work required for normal maintenance and repair.

d) Development by Right. Nothing in these policies prohibits construction or alteration of a single-family home on a legal lot of record if such use is permitted by local land use regulations. Construction of other types of uses also may proceed if local government approvals, based upon previous ALUC compatibility criteria and project review, effectively qualify the development as existing.

e) Parcels Lying within Two or More Compatibility Zones. If a parcel is split by safety zone boundaries, the intensity of development allowed within the more restricted portion of the parcel should be transferred to the less restricted portion. However, the ALUC can consider less restrictive options on a case-by-case basis if special conditions or design criteria are applied to the proposed project. These special conditions may include:

1) Maintaining adequate open space for emergency landings (0.5 acre of parcel);

2) Clustering of development; and

3) Risk reduction building design (i.e., concrete walls, limited number of windows, upgraded roof strength, no skylights, enhanced fire sprinkler system, single-story height, increased number of emergency exits, etc.).

f) Other Special Conditions. The compatibility criteria set forth in this plan are intended to be applicable to all locations within each AIA. However, it is recognized that there may be specific situations where a normally incompatible use can be considered compatible because of terrain, specific location, or other extraordinary factors or circumstances related to the site.

1) After due consideration of all the factors involved in such situations, the ALUC may find a normally incompatible use to be acceptable.

2) In reaching such a decision, the ALUC shall make specific findings as to why the exception is being made and that the land use will not create a safety hazard to people on the ground or aircraft in flight nor result in excessive noise exposure for the proposed use. Findings also shall be made as to the nature of the extraordinary circumstances that warrant the policy exception.

3) The burden for demonstrating that special conditions apply to a particular development proposal rests with the project proponent and/or the referring agency, not with the ALUC.

4) The granting of a special conditions exception shall be considered site specific and shall not be generalized to include other sites.

5) Special conditions that warrant general application in all or part of the AIA of one airport, but not at other airports, are set forth in Chapters 3 of this ALUCP.

This page left intentionally blank.

CHAPTER 3
Oakland International Airport Policies

3.1 Purpose and Scope

This Airport Land Use Compatibility Plan (ALUCP) for Oakland International Airport (OAK) presents the criteria, maps, and policies to be utilized by the Alameda County Airport Land Use Commission (ALUC) and other local jurisdictions. These policies shall apply when reviewing proposals for land use development within the airport influence area (AIA) for its compatibility with airport operations. The ALUC and affected cities within the AIA shall also use these policies when modifying general plans, zoning ordinances, and other local land use policies. The authority for such reviews is derived from the California State Aeronautics Act (Public Utilities Code, Section 21670 *et seq*.).

This ALUCP is based on the OAK's most recent Airport Layout Plan (ALP), which depicts both current (2005) and future (2025) aviation and non-aviation related facilities. While State law (PUC Section 21675 (a)) normally requires that data included in an ALUCP address the anticipated growth of an airport over a minimum of a 20-year period following publication, a state law provision allowing an ALUC's compatibility plan to be based upon an airport layout plan, with the approval of the Division of Aeronautics, was added in 1990. While the timeframe addressed by the OAK's 2006 Master Plan extends to 2025, projects in the Master Plan primarily focus on a "near-term" (2010 – 2012) timeframe. The long-range, "unconstrained", activity forecasts would require additional runway facilities which are not recommended in the Master Plan or the ALP.

This ALUCP is intended to be used in conjunction with the countywide policies and procedures adopted by the ALUC, which are presented in Chapters 1 and 2 of this document.

3.1.1 Airport Influence Area

The policies within this ALUCP apply to all lands within the airport influence area (AIA), also known as the airport referral area. The AIA is the area within which the ALUC is authorized to review new local land use actions, plans, and policies. Figure 3-1 shows the AIA for OAK. This particular AIA was defined based on political boundaries, noise contours and flight tracks. The northernmost boundary of OAK's AIA begins at High Street in the City of Alameda and extends eastward to San Leandro Street. The AIA follows San Leandro Street south until it reaches Lewelling Boulevard in the City of Hayward, where it turns west. The AIA continues to follow Lewelling Boulevard westward until it reaches the Union Pacific Railroad tracks and turns south.

The AIA boundary follows the tracks until it turns east on West Winton Avenue, and continues south on Hesperian Boulevard. The AIA turns west on HWY 92 to the San Francisco Bay. The AIA includes portions of the cities of Oakland, San Leandro, Alameda, Hayward, and small unincorporated areas of Alameda County in the vicinity of the Airport, including San Lorenzo, located southeast of the Airport.

It is also important to note that the southern portion of the AIA for OAK intersects with the Hayward Executive Airport's (HWD) AIA (see Figure 3-2). Should a question of jurisdictional authority arise within this zone of intersect between the AIAs, *the Airport Land Use Compatibility plan with the most stringent land use policies will apply*.

3.2 Compatibility Zones

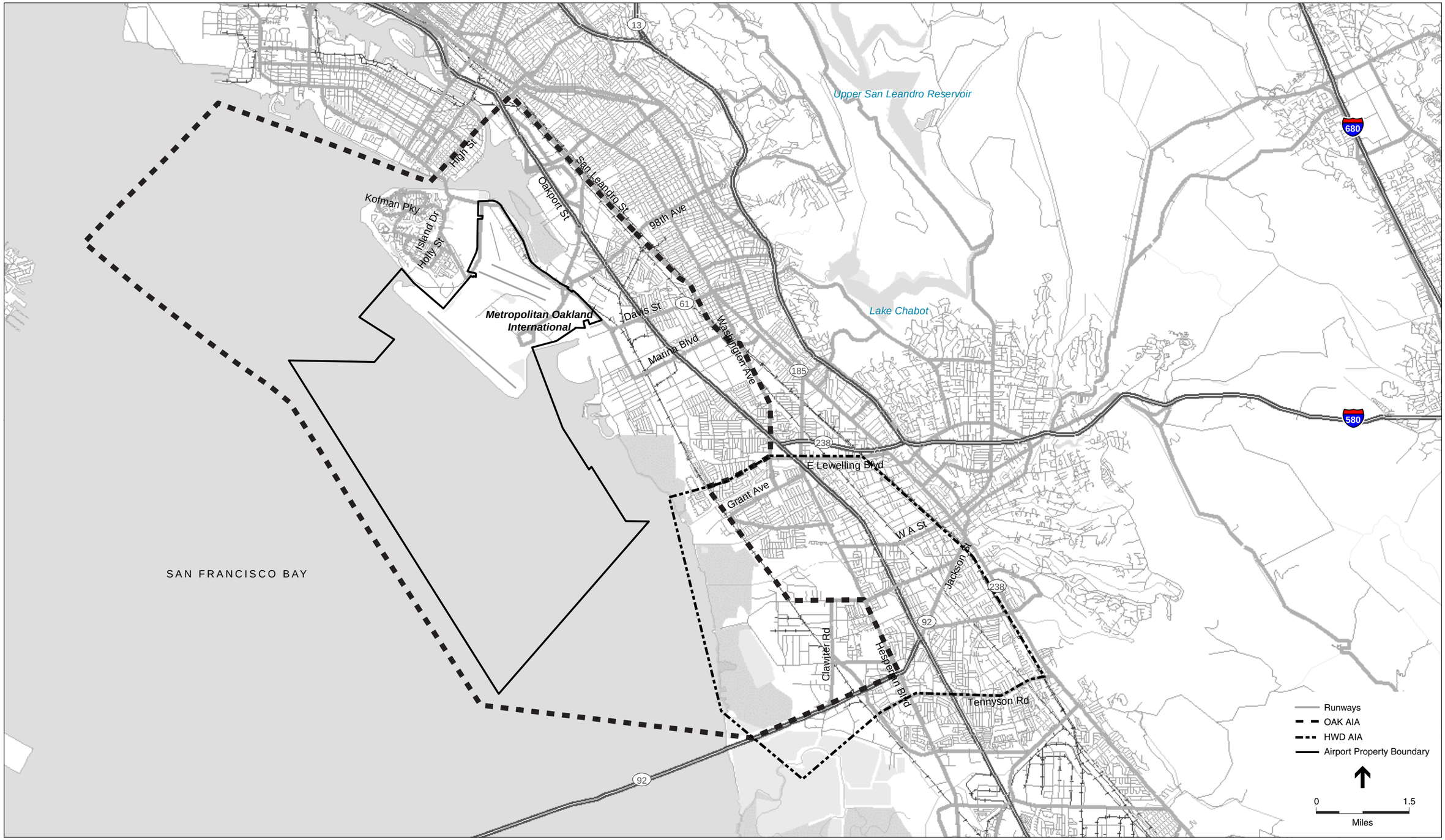
3.2.1 Noise Compatibility Zones

Figure 3-3 presents the projected (2010) noise contours associated with operations at OAK. As shown in the figure, the 60 and 65 Community Noise Equivalent Level (CNEL) contours associated with operations at OAK extend into the AIA for HWD. In most cases where the contours overlap, the noise exposure associated with the OAK contours exceeds the noise exposure that would be associated with the HWD contours. Therefore, when reviewing potential development projects or land use changes in areas where the OAK and HWD contours overlap, noise policies associated with the OAK ALUCP shall apply.

3.2.2 Safety Compatibility Zones

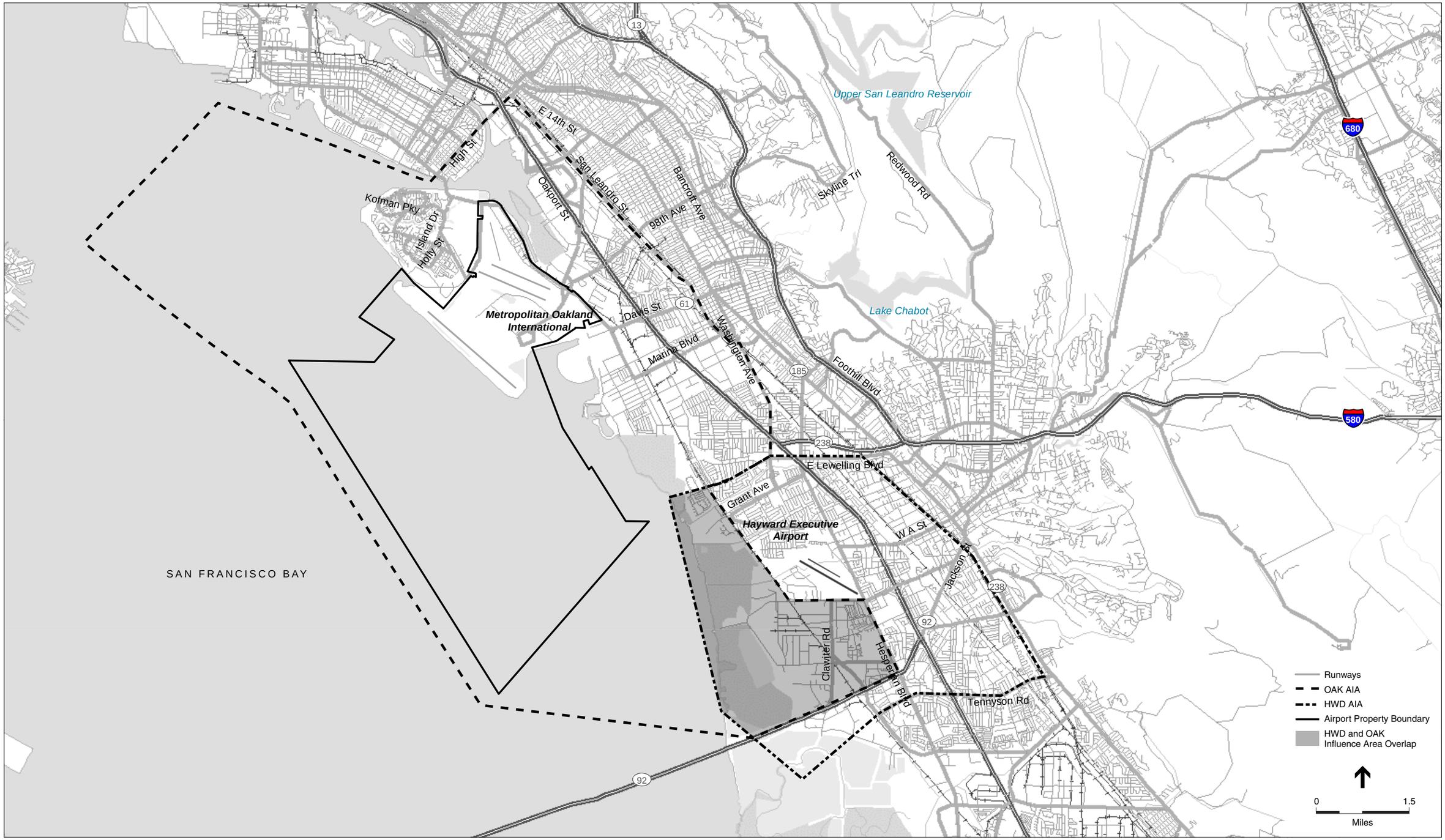
To depict the relative risks of aircraft accidents, the *California Airport Land Use Planning Handbook* (Caltrans, 2002) provides a set of safety zones, and the risk contours upon which they are based. The risk contours are derived from the accident location database described in the *Handbook* and show the relative concentrations of accidents near the ends of runways of different lengths. The safety zones are developed upon this data and are created for varying runway lengths and operational characteristics, while at the same time taking into account aeronautical factors that affect where aircraft accidents are most likely to occur. (For ease of application to land use compatibility planning, safety zones are depicted in regular geometric shapes, as opposed to the risk contours, and assume an equal distribution of arrivals and departures at each runway end.)

A total of seven different safety zones are shown in Figure 3-4. The choice of safety zone criteria appropriate for a particular zone is largely a function of risk acceptability. For example, some land uses represent unacceptable risks when located near aircraft operation areas and are prohibited (e.g., schools and hospitals). Where the risks associated with a particular land use are considered significant but tolerable, restrictions may be established to reduce the risk to an acceptable level. Acceptable land uses generally require no limitations (see Table 3-2 for a list of compatible land uses within each safety zone).



SOURCE: ESA Airports, ESRI, OAK Airport Master Plan

Figure 3-1
Airport Influence Area



SOURCE: ESA Airports, ESRI, OAK Airport Master Plan

Figure 3-2
HWD and OAK Influence Area Overlap

3.2.3 Airspace Protection Zones

The airspace protection zones established for the purpose of evaluating the airspace compatibility of land use development in the AIA of Oakland International Airport are depicted on Figure 3-5. The zones represent the imaginary surfaces defined for the Airport in accordance with Federal Aviation Regulation (FAR) Part 77, *Objects Affecting Navigable Airspace*.

3.2.4 Overflight Zones

The overflight zones established for the purpose of providing overflight notification for land uses in the AIA of OAK are depicted in Figure 3-6.

3.3 Compatibility Policies

3.3.1 Noise

3.3.1.1 Objective

Noise compatibility policies are established in order to prevent the development of noise-sensitive land uses in portions of the airport environ that are exposed to significant levels of aircraft noise.

3.3.1.2 Evaluation

The noise compatibility policies set forth in this section shall be used in conjunction with Figure 3-3 and Table 3-1 during the evaluation of proposed land uses within the AIA for OAK.

a) The criteria in this section indicate the maximum acceptable airport-related noise levels, which are measured in terms of CNEL, for a range of land uses.

b) Within the two noise exposure ranges, each land use type is shown as “compatible”, “conditional”, or “incompatible”. The meaning of these terms is provided in Table 3-1 and differ for indoor versus outdoor uses.

c) Land uses not specifically listed in Table 3-1 shall be evaluated using the criteria for similar listed uses.

3.3.1.3 Measurement

The magnitude of exposure experienced by land around OAK to airport-related noise shall be described in terms of CNEL.

a) The noise contours depict the greatest annualized noise impact, measured in terms of CNEL, anticipated to be generated by the airport over the planning timeframe, which in accordance with state law, extends at least 20 years into the future.

b) The noise contours depicted in Figure 3-3 were created for the current master plan for OAK and utilized by this ALUCP for the purpose of establishing the noise compatibility criteria herein. The ALUC should periodically review the projected CNEL contours and update them if and when appropriate.

c) The threshold for evaluation is the projected 60 dB CNEL contour. All proposed land use changes that would sustain a noise exposure at a level that is less than 60 CNEL is considered consistent with the noise compatibility policies.

3.3.1.4 Factors Determining Noise Criteria

The factors considered during the development of noise criteria include the following:

a) Established federal and state regulations and guidelines;

b) Established local noise-abatement policies, general and specific plan policies;

c) The degree to which noise would affect the activity associated with a particular land use, and ordinances; and

d) The extent of outdoor activity associated with a particular land use.

3.3.1.5 Appropriate Noise Levels for Specific Types of Land Use Development

a) The maximum CNEL considered acceptable for new residential uses in the vicinity of OAK is anything less than the 65 CNEL contour as shown on Figure 3-3.

b) The compatibility of new nonresidential development with noise levels generated by the Airport is provided in Table 3-1.

    1) Buildings associated with land uses listed as “conditional” must have added sound attenuation as necessary to meet the interior noise level standards indicated in Table 3-1 and in Policy 3.3.1.6.

    2) Land uses not specifically identified shall be evaluated using the criteria for listed land uses of a similar nature.

3.3.1.6 Interior Noise Levels

Land uses for which interior activities may be easily disrupted by noise shall be required to comply with the following interior noise level criteria:

a) The maximum, aircraft-related, interior noise level which shall be considered acceptable for land uses within the AIA is 45 dB CNEL in (calculations should assume windows are closed):

1) Living and sleeping areas of single- or multi-family residences;
2) Hotels and motels;
3) Hospitals and nursing homes;
4) Churches, meeting halls, office buildings, and mortuaries; and
5) Schools, libraries, and museums.

b) The maximum, aircraft-related, interior noise level which shall be considered acceptable for land uses within the AIA is 50 dB CNEL in (calculations should assume windows are closed):

1) Office environments;
2) Eating and drinking establishments; and
3) Other miscellaneous commercial facilities.

c) When reviewed as part of a general plan or zoning ordinance amendment or as a major land use action, evidence that proposed structures will be designed to comply with these criteria shall be submitted to the ALUC under the following circumstances: Any hotel or motel, church, meeting hall, office building, mortuary, museum, or other noise-sensitive non-residential use within OAK's 65-dB CNEL contour.

3.3.1.7 Engine Run-Up and Testing Noise

ALUC consideration of noise from engine run-up and testing noise activities shall be limited as follows:

a) Aircraft noise associated with pre-flight engine run-ups, taxiing of aircraft to and from runways, and other operation of aircraft on the ground is considered part of airport operations and is not subject to ALUC regulation. Engine testing noise is not normally included in the noise contours prepared for an airport and has not been considered in preparation of the noise contours presented in Figure 3-3. However, the ALUC may consider noise from these sources when reviewing the compatibility of proposed land uses near OAK to the extent that this noise is reflected in airport noise contours approved by the airport proprietor and the ALUC.

b) Noise from aircraft ground operations also should be considered by the ALUC when reviewing airport master plans or development plans in accordance with the mandatory and voluntary review policies discussed in Chapter 2.

c) Noise from the testing of aircraft engines on airport property is not deemed an activity inherent in the operation of an airport, and it is not an airport-related impact addressed by this ALUCP. Noise from these sources should be addressed by the noise policies of local agencies in the same manner as noise from other industrial sources.

TABLE 3-1

NOISE COMPATIBILITY CRITERIA

Land Use Category	Exterior Noise Exposure (dB CNEL)		
	60	65	70
Agricultural, Recreational, and Animal-Related			
Outdoor amphitheaters			
Zoos; animal shelters; neighborhood parks; playgrounds			
Regional parks; athletic fields; golf courses; outdoor spectator sports; water recreation facilities			
Nature preserves; wildlife preserves; livestock breeding or farming			
Agriculture (except residences and livestock); fishing			
Residential, Lodging, and Care			
Residential, (including single-family, multi-family, and mobile homes)*			
Residential hotels; retirement homes; hospitals; nursing homes; intermediate care facilities			
Hotels; motels; other transient lodging			
Public			
Schools; libraries			
Auditoriums; concert halls; indoor arenas; places of worship; cemeteries			
Commercial and Industrial			
Office buildings; office areas of industrial facilities; medical clinics; clinical laboratories; commercial - retail; shopping centers; restaurants; movie theaters			
Commercial - wholesale; research and development			
Industrial; manufacturing; utilities; public rights-of-way			

Land Use	Acceptability	Interpretation/Comments
	Compatible	*Indoor Uses*: Standard construction methods will sufficiently attenuate exterior noise to an acceptable indoor community noise equivalent level (CNEL). *Outdoor Uses*: Activities associated with the land use may be carried out with essentially no interference from aircraft noise. * The maximum acceptable noise exposure for new residential development in the vicinity of OAK is anything below 60 CNEL (see Policy 3.3.1.2 (b).)
	Conditional	*Indoor Uses*: Building structure must be capable of attenuating exterior noise to the indoor CNEL of 45 dB; standard construction methods will normally suffice. *Outdoor Uses*: CNEL is acceptable for outdoor activities, although some noise interference may occur; caution should be exercised with regard to noise-sensitive uses.
	Incompatible	*Indoor Uses*: Unacceptable noise interference if windows are open; at exposures above 65 dB CNEL, extensive mitigation techniques are required to make the indoor environment acceptable for performance of activities. *Outdoor Uses*: Severe noise interference makes outdoor activities unacceptable.

Source: ESA, 2007; *California Airport Land Use Compatibility Handbook* (Caltrans, 2002); PUC 21001 *et seq.*, California State Aeronautics Act.
Note: The layout of this table was created using the framework developed in previous compatibility plans (Mead & Hunt, 2006).

3.3.2 Safety

3.3.2.1 Objective

Land use safety compatibility criteria are developed to minimize the risks to people and property on the ground as well as those people in an aircraft in the event of an accident or emergency landing occurring outside the airport boundary. Policies set forth in this section focus on reducing the potential consequences of such events when they occur. The most stringent land use controls shall be applied to the areas with greatest risk potential.

3.3.2.2 Evaluation

The safety compatibility of proposed uses within OAK's AIA should be evaluated in accordance with the policies set forth in this section, including the safety zones presented on Figure 3-4 and the criteria listed in Table 3-2.

a) The criteria in Table 3-2 indicate whether a particular type of land use is "compatible", "conditional", or "incompatible" with the exposure to aircraft accident risks. The meaning of these terms is provided in the table.

b) Land uses not specifically listed should be evaluated using the criteria for similar listed uses.

3.3.2.3 Measurement

The concept of risk is essential to maintaining a high degree of safety in an airport environment. For the purposes of this ALUCP, the risk that potential aircraft accidents pose to land around OAK shall be defined in terms of the geographic distribution of where accidents are most likely to occur. Due to the infrequency of aircraft accidents, the pattern of accidents at any one airport cannot be used to predict where future accidents are most likely to occur around a particular airport. The safety zones depicted in the *California Airport Land Use Compatibility Handbook* (*Handbook*), and upon which the safety zones in the ALUCP are based, were formulated using the accident distribution patterns presented in the *Handbook* for similar airports nationwide.

3.3.2.4 Factors Determining Safety Criteria

In determining criteria for each safety zone and the overall approach to this compatibility factor, the following issues were considered:

a) Locations, delineated in respect to the runway, where aircraft accidents near general aviation airports typically occur. The most stringent land use controls should be applied to the areas where the greatest risk of aircraft accidents is likely to occur (as delineated by the Caltrans *Handbook*).

b) Runway length and approach categories for each runway at OAK. These factors are reflected in the safety zone shapes and sizes, and are based upon zones suggested in the Caltrans *Handbook*.

c) Encroachment of incompatible land uses. The Caltrans *Handbook* suggests that, "because many general aviation airports are located on the fringes of urban areas, both the threat of new incompatible development and the opportunity for ALUCs to help preserve a compatible airport land use relationship are great." The location of OAK in a dense urban setting amplifies the need to strike a balance between making land use decisions that will benefit both local jurisdictions and the public airport serving them, while preserving the safety of the general public.

3.3.2.5 Airport Safety Zones

A total of seven different safety zones were identified as shown in Figure 3-4. As described above, the choice of safety zone criteria appropriate for a particular zone is largely a function of risk acceptability. Land uses (e.g., schools and hospitals) which, for a given proximity to the airport, are judged to represent unacceptable risks must be prohibited. Where the risks of a particular land use are considered significant but tolerable, establishment of restrictions may reduce the risk to an acceptable level. Uses which are basically acceptable generally require no limitations (see Table 3-2 for a list of compatible land uses within each safety zone).

In certain situations, such as venues accommodating the assemblage of large numbers of people (i.e., sports stadiums, amphitheaters, etc.), the perceived risk of an aircraft accident occurring in a location where large amounts of people have restricted mobility may be perceived as an intolerable risk no matter where it may be located within an AIA.

a) For the purpose of presenting safety policies, each safety zone shall be considered as such:
    - Zone 1: Runway Protection Zones
    - Zone 2: Inner Approach / Departure Zones
    - Zone 3: Inner Turning Zones
    - Zone 4: Outer Approach / Departure Zones
    - Zone 5: Sideline Zones
    - Zone 6: Traffic Pattern Zone
    - Zone 7: Other Airport Environs

As shown on Figure 3-4, most of the safety zones associated with the South Field (commercial runway) extend over the San Francisco Bay. However, Safety Zones 2, 3, and 5 remain over land. The Portions of the safety zones extending over the Bay are provided for illustration purposes only.

3.3.2.6 Residential Development Criteria

The development of new residential land uses is restricted in the following ways:

a) In Safety Zone 1, no new dwellings shall be constructed.

b) In Safety Zones 2, 3, 4, and 5, new dwellings are not recommended within the zone boundaries. However, due to the existing urban nature of the surrounding environs and the existing residential land use, infill may be allowed up to an average of the surrounding residential use (except for high density residential), provided that other safety criteria identified in this plan are satisfied (see Policy 2.7.5.7(a) for infill criteria). Additional criteria for residential development in these zones are as follows:

    1) The minimum adjacent open space required is approximately 0.5 acre (see Policy 3.3.2.11).

    2) Clustering to meet these criteria is recommended for projects of 10.0 acres or more with one 0.5 acre open space area to be provided per each 10 acres of the site.

    3) For projects of less than 10 acres, compliance with the clustering condition is desirable, but not required as a condition for development approval.

    4) The clustering of residential development must not result in the density within any single 1.0-acre area exceeding 20.0 dwelling units per acre.

c) In Safety Zones 6 and 7, residential development is not restricted.

3.3.2.7 Nonresidential Development Criteria

The following criteria apply to most proposed nonresidential development. Separate or additional criteria for land uses of special concern are described in Policy 3.3.2.8. For the purposes of the ALUCP, the primary measure of risk exposure for people on the ground in the event of an aircraft accident is based in the number of people concentrated in areas most susceptible to the risk of aircraft accidents.

a) With respect to the vicinity of OAK, the maximum acceptable intensity of new nonresidential development, including all people (e.g., employees, customers/visitors) who may be at a particular location at any single point in time, both indoor and outdoors, shall be limited to the intensities indicated in Table 3-2. Nonresidential intensity criteria reflect a mix of intensities for rural/suburban and urban settings (as set forth in Table 9C of the Caltrans *Handbook*), which reflects the current environment around OAK.

b) The compatibility of a proposed nonresidential land use shall be evaluated using the land use types listed in Table 3-2.

    1) The nonresidential uses are categorized primarily with respect to the typical occupancy load factor of the use measured in terms of square footage per

occupant. Also indicated in the table is the California Building Code (CBC) classification under which each facility is presumed to be constructed.

2) Proposed development not listed in Table 3-2 shall be evaluated by comparison to a similar use on the list.

c) Land uses shown in Table 3-2 as being considered "compatible" within a particular safety zone are presumed to comply with the intensity limits. However, abnormal examples of these uses may require review to ensure compliance with the criteria.

d) Land use shown as "conditional" should comply with the conditions listed in the table.

1) In circumstances where a floor area ratio limit is cited as a conditional criterion, the limit is based on a typical occupancy level (floor area square footage per person) as defined by the CBC for that use[1]. The assumed occupancy levels are shown in the table.

2) Local jurisdictions may make exceptions for rare, special events for which a facility is not designated and normally not used and for which extra safety precautions can be taken as appropriate.

3) The ALUC may allow intensity bonuses for conditional uses within a particular safety zone when risk-reducing building design techniques are employed. Risk-reduction building features include:

- Concrete walls;
- Limited number and size of windows;
- Upgraded roof strength;
- No skylights;
- Enhanced fire sprinkler system;
- Single-story height; and/or
- Increased number of emergency exits.

In these circumstances, the ALUC should allow no more than 1.5 to 3.0 times the basic intensity (as determined in Table 3-2) required.

3.3.2.8 Land Uses of Particular Concern

Land uses which pose the greatest concern are those in which the occupants have reduced effective mobility or are unable to respond in emergency situations. Children's schools, day care centers, hospitals, nursing homes, and other uses in which the majority of occupants are children, elderly, and/or handicapped shall be prohibited within Zones 1 through 5.

a) For the purposes of these criteria, children's schools include all grades through grade 12.

[1] The equation for determining the appropriate floor area ratio is as follows:
Floor area ratio = $\frac{\text{(allowable usage density)x(occupancy load factor)}}{\text{43,560 square feet in one acre}}$

b) Day care centers and family day care homes are defined by state law. Non-commercial day care centers ancillary to a place of business are permitted in Zones 2 through 5 provided that the overall use of the property meets the intensity criteria indicated below. Family day care homes are permitted in any location where residential development is permitted and the intensity of the day care home is ≤6 people. No restrictions apply in Safety Zones 6 and 7.

c) In-patient health care facilities include hospitals, health care facilities, and other types of non-ambulatory medical centers. Land uses of these types are prohibited in Safety Zones 1 through 5, and permissible in Zones 6 and 7.

d) Out-patient health care facilities such as health care centers, clinics, dentists' offices, and other types of ambulatory facilities are conditionally acceptable in Safety Zone 3 and 4 provided that the conditional criteria in Table 3-2 are achieved.

e) Storage of fuel and other hazardous materials within the airport environs are restricted as follows:

    1) Within Zones 1 and 2, storage of any such substance is prohibited.

    2) Within Zones 3, special measures to minimize risk in the event of an aircraft accident are to be determined by the appropriate permitting agency. Aboveground fuel storage of more than 6,000 gallons is prohibited.

3.3.2.9 Mixed-Use Development

If a combination of land use types listed separately in Table 3-2 is proposed for a single project or site, the following policies apply:

a) Where residential and nonresidential uses are proposed to be located in the same or nearby buildings, both residential and nonresidential density criteria must be achieved. The number of dwelling units shall not exceed the density limits indicated in Table 3-2. Both occupancy totals (residential and nonresidential) will be considered with respect to the nonresidential usage intensity criteria cited in the table.

    1) Except as designated below in paragraph (2), this mixed-use development criterion is proposed for dense, urban-type developments where the overall usage intensity and ambient noise levels are relatively high.

    2) Mixed-use development is prohibited where the residential component would be exposed to noise levels exceeding the limits set in Policy 3.3.1.5.

b) Where proposed development will constitute a mixture of nonresidential land uses as identified in Table 3-2, the total number of occupants for all uses shall be added to determine the total number of people on the site. The total number of occupants on the site shall not exceed the maximum set forth in Table 3-2.

1) The number of people for each use shall be estimated to equal the square footage of that use divided by the occupancy load factor (square footage per person) cited in Table 3-2.

2) If an occupancy load factor is not provided for a specific use, the number of occupants may be estimated by using parking space requirements of the affected jurisdiction.

3.3.2.10 Criteria for Clustering of Development

The ALUC generally supports clustering to enhance safety compatibility in the vicinity of airports. Clustering occurs when development is concentrated on one portion of a site or within an overall safety zone, leaving other areas as open space because of terrain, environmental, or other considerations. If the area remaining undeveloped is relatively level and free of large obstacles, clustering provides for a greater amount of open space towards which a pilot can land the aircraft; thus reducing the risk of harm to people on the ground. However, an aircraft still has the potential to strike a clustered site, and as such, limitations on the maximum concentrations of dwellings or people in a small area of a large project site are appropriate.

a) No development shall be clustered in a manner that would exceed the intensity limits listed as incompatible in Table 3-2.

b) An intensity bonus of up to 3.0 times the normal allowable intensity (as described in Table 3-2) can be applied for development that employs risk reduction design standards as described in Policy 2.7.6.7(e).

3.3.2.11 Open Land

In the event of an emergency landing, risks to both people in the aircraft and on the ground can be minimized by providing as much open land as possible in the vicinity of the airport.

a) To be considered “open land”, an area should:

   1) Be free of obstacles such as large trees, walls, or poles, and overhead wires.

   2) Have minimum dimensions of approximately 75 feet by 300 feet (0.5 acre).

b) Open land areas should be oriented with the typical direction of aircraft flight over the location.

c) Roads and automobile parking areas are considered acceptable as open land areas.

d) Open land areas should be identified at the general or specific plan level, or as part of large (greater than 20 acres) development projects.

e) Open land should not preserve or create habitat that could pose hazards to aircraft. For example, wildlife refuges, mitigation banks, wetlands, and other uses that provide habitat or food sources for birds or other wildlife that are hazardous to aircraft operations.

f) Clustering of development, as detailed in Policy 3.3.2.10, is encouraged to increase the amount of open land.

TABLE 3-2
SAFETY COMPATIBILITY CRITERIA

Types of Land Use	Description of Occupancy	Safety Zones							Criteria for Conditional Uses
Note: Multiple categories may apply to same project		**1**	**2**	**3**	**4**	**5**	**6**	**7**	
Maximum Nonresidential Intensity (People/Acre)		10	60	100	100	150	No Limit	No Limit	
Required Open Land		100%	40%	30%	20%	20%	0%	0%	
CBC Groups*									
A-1	High capacity indoor assembly room (≥1,000 people): professional sports arena, concert hall, etc.								Zones 6, 7: Allowable if no other suitable site outside AIA is available.
A-2 - A-2.1	Medium to large indoor assembly room (≥300, <1,000 people): malls, theaters, meeting halls, etc. (approx. 15 s.f./ person)								
A-3	Low capacity indoor assembly room (<300 people) meeting rooms, college or university lecture halls, places of worship, etc. (approx. 60 s.f./ person)			0.14	0.14				Zones 3, 4: Floor area ratio as indicated
A-4	Large outdoor assembly area (>1,000 people): amusement park area, amphitheaters, stadiums, etc.								Zones 6, 7: Allowable if no other suitable site outside AIA is available.
	Medium outdoor assembly area (≥300, <999 people): fair grounds, etc.								Zones 3, 4, 6: Allowable if no other suitable site outside AIA is available.
	Small outdoor assembly area (>50, ≤299 people): camp ground, community pool, etc.								Zones 3, 4, 6: Allowable if no other suitable site outside AIA is available.
B	Office buildings (approx. 215 s.q./ person)		0.30	0.49	0.49	0.74			Zones 2, 3, 4, 5: Floor area ratio as indicated. Also see Policy 3.3.2.7(c)(3).
B	Small eateries/drinking establishments (approx. 60 s.f./ person)			0.14	0.14	0.21			Zones 3, 4, 5: Floor area ratio as indicated. Also see Policy 3.3.2.7(c)(3).
B	Misc. medium sized businesses (approx. 200 s.f./ person): salons, electronics stores, etc.		0.28	0.46	0.46	0.69			Zones 2, 3, 4, 5: Floor area ratio as indicated. Also see Policy 3.3.2.7(c)(3).
E-1 - E-2	Children's schools (K - 12)								
E-3	Commercial Daycare center (≥6 people)								

TABLE 3-2
SAFETY COMPATIBILITY CRITERIA

Types of Land Use	Description of Occupancy	Safety Zones							Criteria for Conditional Uses
Note: Multiple categories may apply to same project		**1**	**2**	**3**	**4**	**5**	**6**	**7**	
Maximum Nonresidential Intensity (People/Acre)		10	60	100	100	150	No Limit	No Limit	
Required Open Land		100%	40%	30%	20%	20%	0%	0%	
F-1, 2	Manufacturing, research and development (300 s.f./ person)[1]			0.69	0.69	1.03			Zones 3, 4, 5: Floor area ratio as indicated. Also see Policy 3.3.2.7(c)(3).
H-1, 2, 3, 4, 5, 6, 7	Occupancies utilizing hazardous (flammable, explosive, corrosive, or toxic) materials								Zones 3 - 5: Special measures to minimize risk in the event of an aircraft accident to be determined by permitting agencies
I-1.1	Nurseries for full-time care of children (≤14 people)								
I-1.1 - I-1.2	Health care facilities: hospitals, health care centers, sanitariums, nursing homes for nonambulatory patients, etc. (approx. 250 s.f./ person)								
I-2	Congregate care facilities (>5 patients): nursing homes for ambulatory patients, assisted living facilities (approx. 100 s.f./ person)			0.55	0.55				
I-3	Jails, prisons, mental institutions, etc.								Zones 6, 7: Allowable if no other suitable site outside AIA is available.
M	Mixed use retail centers with restaurant facilities (approx. 110 s.f./ person)		0.15	0.25	0.25	0.38			Zones 2, 3, 4, 5: Floor area ratio as indicated
	Retail center with no restaurant facilities (approx. 170 s.f./ person)		0.23						Zones 2, 5: Floor area ratio as indicated
R-1	Hotels, apartments, congregate residences for ≥10 persons (>14.0, ≤20.0 d.u./acre)								
	Hotels, apartments, congregate residences ≥10 persons (>18.0 d.u./acre)								
R-2.1-2.1.1	Residential care facilities for the elderly (<6, ≥6 non-ambulatory clients)								
R-2.2 - 2.2.1	Residential care facilities for the elderly (<6, ≥6 ambulatory clients)								
R-2.3 - 2.3.1	Residential-based hospice facilities (<6, ≥6 bedridden clients)								

TABLE 3-2
SAFETY COMPATIBILITY CRITERIA

Types of Land Use	Description of Occupancy	Safety Zones							Criteria for Conditional Uses
Note: Multiple categories may apply to same project		1	2	3	4	5	6	7	
Maximum Nonresidential Intensity (People/Acre)		10	60	100	100	150	No Limit	No Limit	
Required Open Land		100%	40%	30%	20%	20%	0%	0%	
R-3	Low density residential (0 – 8 d.u./ acre[2])								See Policy 3.3.2.6 (b) (1) – (4)
	Medium density residential (8 – 21 d.u./ acre[2])								See Policy 3.3.2.6 (b) (1) – (4)
	High density residential (21 – 30 d.u./ acre[2])								
S-1	Storage of hazardous materials: gas stations, etc.								Zones 3, 5: Also see policy 3.3.2.8 (e)(2).
S-2	Warehouses, distribution facilities (approx. 500 s.f./ person)		0.69	1.15					
S-3	Repair garages not requiring use of flammable objects								
S-4	Open parking garages								
U-1	Private garages, carports, and agricultural buildings								
U-2	Tanks and towers								See Section 3.3.3 for airspace protection policies
Other Types of Land Uses									
Agriculture	Truck and specialty crops[3]								Zone 1: Not allowed in Object Free Area, and avoid crops that act as wildlife attractants
	Field crops (grains, rice, but no stalk crops)								Zone 1: Not allowed in Object Free Area, and avoid crops that act as wildlife attractants
	Field crops (corn and other stalk crops)[3]								
	Pasture and range land								
	Orchards and vineyards[3]								
	Dry farm and grain[3]								
	Tree farms, landscape nurseries, and greenhouses								
	Fish farms								
	Feed lots and stockyards								
	Poultry farms								
	Dairy farms								
Natural Uses	Forest reserves								

TABLE 3-2
SAFETY COMPATIBILITY CRITERIA

Types of Land Use	Description of Occupancy	Safety Zones							Criteria for Conditional Uses
Note: Multiple categories may apply to same project		**1**	**2**	**3**	**4**	**5**	**6**	**7**	
Maximum Nonresidential Intensity (People/Acre)		10	60	100	100	150	No Limit	No Limit	
Required Open Land		100%	40%	30%	20%	20%	0%	0%	
	Fish and game reserves								
	Land reserves and open space								
	Waterways (rivers, creeks, swamps bays, lakes)								Zone 1: Not allowed in Runway Safety Area
Recreation	Golf courses[3]								
	Parks (i.e., playgrounds, picnic areas, athletic fields, tennis courts, etc.)[3]								Zones 2 – 4: See airspace protection policies in Section 3.3.3. Avoid vegetation and water uses that attract wildlife.
	Riding stables and trails								
	Marinas								
Utilities	Roadways								Zone 1: Not allowed in Object Free Area
	Reservoirs								
	Water treatment[2]								Mitigation required to prevent attraction of wildlife hazards
	Sewage disposal[2]								
	Electrical substations[4]								Zone 3: Allowable if no other suitable site outside AIA is available.
	Power plants[4]								Zone 7: Allowable if no other suitable site outside AIA is available. Also see Policy 3.3.3.7(b).
	Power lines[4]								

	Compatible: Use is acceptable without conditional restraints (noise, airspace protection, and/or overflight limitations may still apply)
	Conditional: Use is considered acceptable if listed conditions are met
	Incompatible: Use should not be permitted under any circumstances

*** CBC Groups:** Describes building occupancy types established by the California Building Code (see Appendix D)
[1] These uses may generate dust, smoke, or other hazards to flight. Also see Section 3.3 for applicable policies.
[2] Ranges for dwelling units per acre derived from ranges similar to zoning from jurisdictions within OAK AIA.
[3] These uses may attract birds or other wildlife considered potentially hazardous to flight.
[4] Power lines, smoke stacks, or other tall objects associated with these uses may be hazards to flight. Also see Section 3.3

Source: ESA, 2007; *California Airport Land Use Planning Handbook* (Caltrans, 2002); California Building Code, 2001.
Note: The layout of this table was created using the framework developed in previous compatibility plans (Mead & Hunt, 2006).

3.3.3 Airspace Protection

3.3.3.1 Objective

Similar to safety policies, airspace protection criteria is intended to reduce the risk of harm to people and property resulting from an aircraft accident. This is accomplished by the establishment of compatibility policies that seek to prevent the creation of land use features that can be hazards to the airspace used by aircraft in flight and have the potential to cause an aircraft accident to occur. Such hazards may be physical, visual, or electronic.

3.3.3.2 Evaluation

Tall structures, trees, other objects, or high terrain on or near airports, may constitute hazards to aircraft. Federal regulations establish the criteria for evaluating potential obstructions. These regulations require that the FAA be notified of proposals related to the construction of potentially hazardous structures (see Appendix C). The FAA conducts aeronautical studies of proposed projects to determine whether they would pose risks to aircraft, but it does not have the authority to prevent their construction. The purpose of ALUC airspace protection policies, together with regulations established by local land use jurisdictions and the state government, is to avoid the creation of hazards to the navigable airspace. The policies set forth in this section apply to the entire AIA.

3.3.3.3 Measurement

FAR Part 77, *Objects Affecting Navigable Airspace*, provides guidance for the height of objects that may affect normal aviation operations. The guidance provided by Part 77 is not absolute, however. Deviation from the Part 77 standards does not necessarily mean that a proposed object is prohibited from construction, only that the offending object must be evaluated by the FAA and that mitigative actions, such as marking or lighting may be required. Figure 3-5 depicts the Part 77 surfaces in the vicinity of OAK.

3.3.3.4 Factors Determining Airspace Protection Criteria

As described above, airspace protection policies rely upon regulation enacted by FAA and the state of California; ALUC policies are intended to help implement the federal and state regulations.

a) FAA has well-defined standards by which potential hazards to flight, especially airspace obstructions, can be assessed. However, FAA has no authority to prevent the creation of such hazards; that authority rests with state and local officials.

b) California airspace protection standards mostly mirror those of the FAA; the primary difference being that state law gives the California Department of Transportation, Division of Aeronautics and local agencies the authority to enforce the standards.

3.3.3.5 FAA Notification

Proponents of a project that may exceed the elevation of a Part 77 surface must notify the FAA as required by FAR Part 77, Subpart B, by the State Aeronautics Act, and by Public Utilities Code Sections 21658 and 21659.

a) Local jurisdictions shall inform project proponents of the requirements for notifying the FAA.

b) FAA review is required for any proposed structure more than 200 feet above the ground level of its site. All such proposals also shall be submitted to the ALUC for review regardless of where in the county the object would be located.

c) Any project submitted to the ALUC for airport land use compatibility review for reasons of height issues shall include a copy of FAR Part 77 notification to the FAA and the results of the FAA's analysis.

d) FAA notification shall not automatically trigger an airport compatibility review of a project by the ALUC, unless the general plan of the jurisdiction in which the project is located has not been deemed compatible with this ALUCP.

3.3.3.6 Obstruction Marking and Lighting

FAA or the California Division of Aeronautics will determine the need for marking and lighting of obstructions as part of aeronautical studies conducted in accordance with FAR Part 77. Under most circumstances, when reviewing proposed structures that exceed the height criteria, The ALUC is expected to abide by the FAA's conclusions regarding marking and lighting requirements. However, situations may arise in which the ALUC, because of its particular knowledge of local airports and airspace, may reach a different conclusion than the FAA. In such instances, the ALUC may determine either that a proposed structure is unacceptable or that it is acceptable only with appropriate marking and lighting. Any marking and lighting that the ALUC may require shall be consistent with FAA standards as to color and other features.

3.3.3.7 Other Flight Hazards

Land uses that may cause visual, electronic, navigational, or bird strike hazards to aircraft in flight shall be allowed within the airport influence area only if the uses are consistent with FAA rules and regulations.

a) Specific characteristics to be avoided include:

    1) Glare or distracting lights that could be mistaken for airport lights;

    2) Sources of dust, heat, steam, smoke, or thermal plumes that may impair pilot vision or create turbulence within the flight path;

3) Sources of electrical or other interference that could affect aircraft communications or navigation; and

4) Any proposed use that creates an increased attraction for wildlife and that is inconsistent with FAA rules and regulations including, but not limited to, FAA Order 5200.5A, *Waste Disposal Sites On or Near Airports*, and Advisory Circular 150/5200-33B, *Hazardous Wildlife Attractants On or Near Airports*. Land uses with the possibility of attracting hazardous wildlife include landfills and certain recreational or agricultural uses that attract large flocks of birds..

b) Due to their propensity to generate smoke, steam, and other visual and physical hazards to aircraft in flight, power plants should be avoided in the AIA. However, given the varying types of power plants (i.e., thermal, solar, wind, etc.), proposed land uses of this kind within the AIA should be evaluated on a case-by-case basis, and in accordance with FAA criteria and the policies set forth in this Plan.

c) In order to resolve any uncertainties or differences with regard to the significance of the above types of flight hazards, local agencies should consult with FAA officials and OAK management.

3.3.3.8 Avigation Easement Dedication

Avigation easements transfer certain property rights from the owner of a property to the owner of the airport (i.e., the Port of Oakland). ALUCs may recommend the dedication of an avigation easement as a condition for approval of development on property to restrict the heights of structures or trees. Avigation easements should be dedicated to the airport owner as a condition for any discretionary local approval of any residential or non-residential development within the area indicated on Figure 3-5 that has the potential to cause obstructions or other flight hazards as identified in Section 3.3.3.7.

a) The avigation easement shall:

1) Identify the potential hazard associated with the proposed project and its location within protected airspace;

2) Identify the airport owner's right to clear or maintain the airspace from potential hazards;

3) Identify the right to mark potential obstructions and notify aviators of such hazards; and

4) Provide the right to pass within the identified airspace.

b) Neither a separate overflight easement nor a separate real estate disclosure is required for properties for which an avigation easement is required.

c) An example of an avigation easement is provided in Appendix E.

3.3.4 Overflight

3.3.4.1 Objective

Noise from the overhead flight of aircraft can be annoying and intrusive in locations beyond the limits of the noise contours identified in Section 3.3.1. While sensitivity to aircraft overflights will vary from person to person, the basic intent of overflight policies is to warn people near an airport of the presence of aircraft so that they have the ability to make informed decisions regarding the acquisition or lease of property within the influence area of an airport.

3.3.4.2 Evaluation

Unlike other compatibility factors such as noise, safety, or airspace protection, overflight compatibility policies do not restrict how land can be developed or used; rather, the policies in this section form the requirements for notification about airport proximity and aircraft overflights. These policies are to be applied with local agency approval of new development. The boundaries of the overflight zones around OAK are identified in Figure 3-6.

3.3.4.3 Measurement

Determining the boundaries of overflight noise exposure is difficult to determine as these locations extend well beyond the defined CNEL contours normally associated with areas of high noise exposure. The general locations over which aircraft routinely fly, including when they approach and depart an airport is generally used as an indicator of overflight annoyance concern. Furthermore, the FAA has determined that for the purposes of NEPA changes in Aircraft Flight tracks below 3,000 feet, AGL require more rigorous environmental review than those changes occurring above 3,000 feet AGL.

3.3.4.4 Factors Determining Overflight Criteria

In determining the overflight criteria for OAK, the following factors were considered:

a) Limitations of ALUC authority of existing land uses. In order to be most effective, overflight policies would ideally apply to all real estate transactions; existing and new. However, the ALUC only has authority to set requirements for new development and to define the boundaries within which real estate transfer disclosure under state law is appropriate.

b) Need for continuity of real estate disclosure to future property owners and tenants. It is recommended that real estate notifications run with the land and is provided to prospective future owners and tenants.

c) Excessiveness of avigation easement dedication used solely for buyer awareness purposes. Avigation easements require the conveyance of property rights from the owner

to the party owning the easement, and as such, are best suited to locations where land use restrictions for noise, safety, or airspace protection is necessary.

3.3.4.5 Overflight Notification

As a condition for local agency approval of new residential land use development within the zone indicated on Figure 3-6, an overflight notification shall be recorded.

a) The overflight notification shall contain the language provided by state law with regard to real estate transfer disclosure (see Policy 3.3.4.6) and shall be of a format similar to that indicated in Appendix E.

b) The notification shall be evident to prospective buyers of the property and shall appear with the property deed.

c) A separate overflight notification is not required where an avigation easement is provided.

d) Recording of an overflight notification is not required for nonresidential development.

3.3.4.6 Buyer Awareness Measures

Effective as of January 1, 2004, California state statutes (Business and Professional Code Section 11010 and Civil Code Sections 1102.6, 1103.4, and 1353) mandate that sellers of real property must disclose information regarding whether their property is situated within an AIA.

a) These state requirements apply to the sale or lease of newly subdivided lands and condominium conversions and to the sale of certain existing residential property.

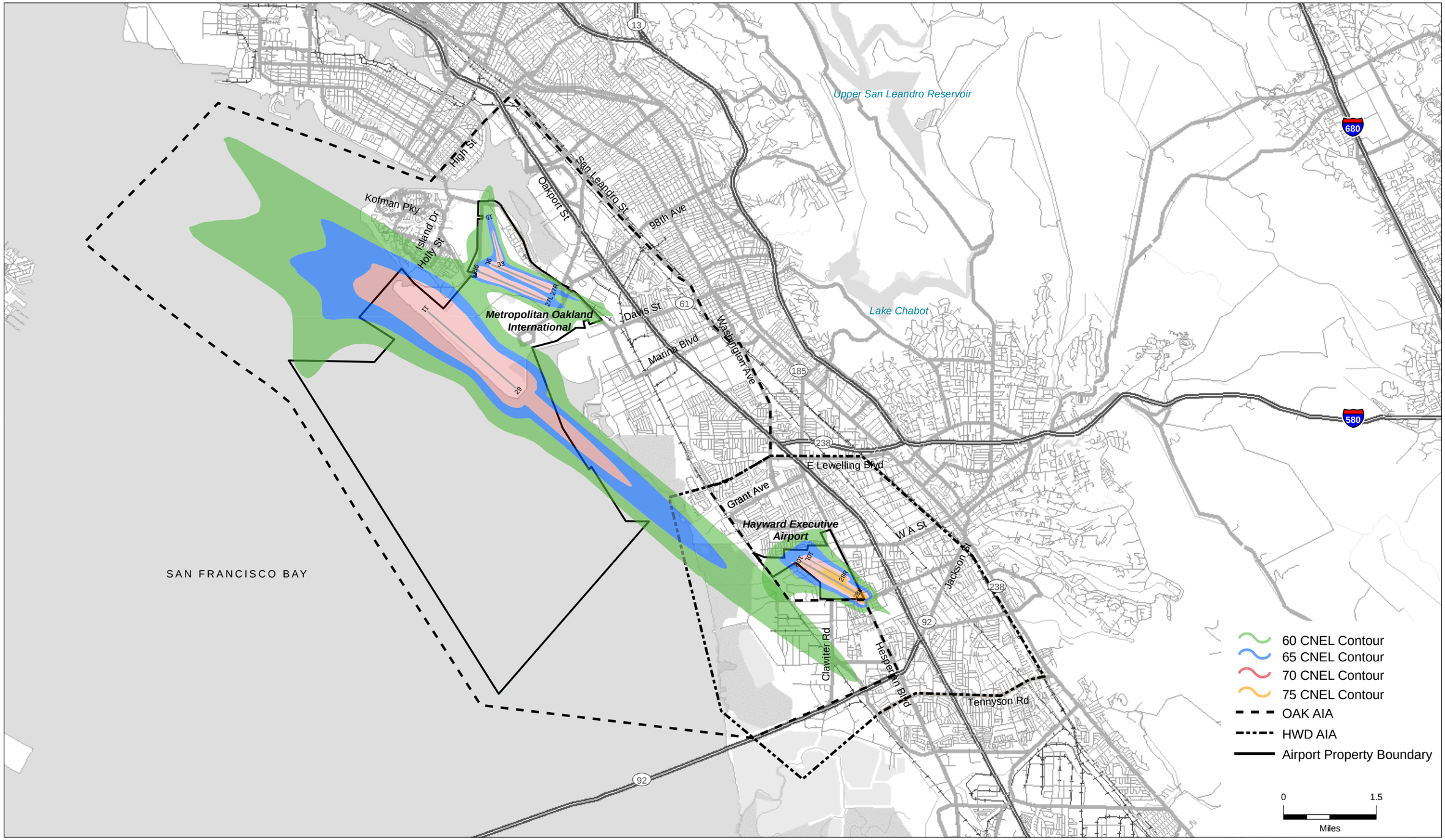
b) Except where dedication of an avigation easement is required, a deed notice shall be recorded for each parcel associated with any land use action reviewed by the ALUC. A sample recorded deed notice is presented in Appendix E.

c) Where disclosure is required, the state statutes dictate that the following statement shall be provided:

NOTICE OF AIRPORT IN VICINITY

This property is presently located in the vicinity of an airport, within what is known as an airport influence area. For that reason, the property may be subject to some of the annoyances or inconveniences associated with proximity to airport operations (for example: noise, vibration, or odors). Individual sensitivities to those annoyances can vary from person to person. You may wish to consider what airport annoyances, if any, are associated with the property before you complete your purchase and determine whether they are acceptable to you.

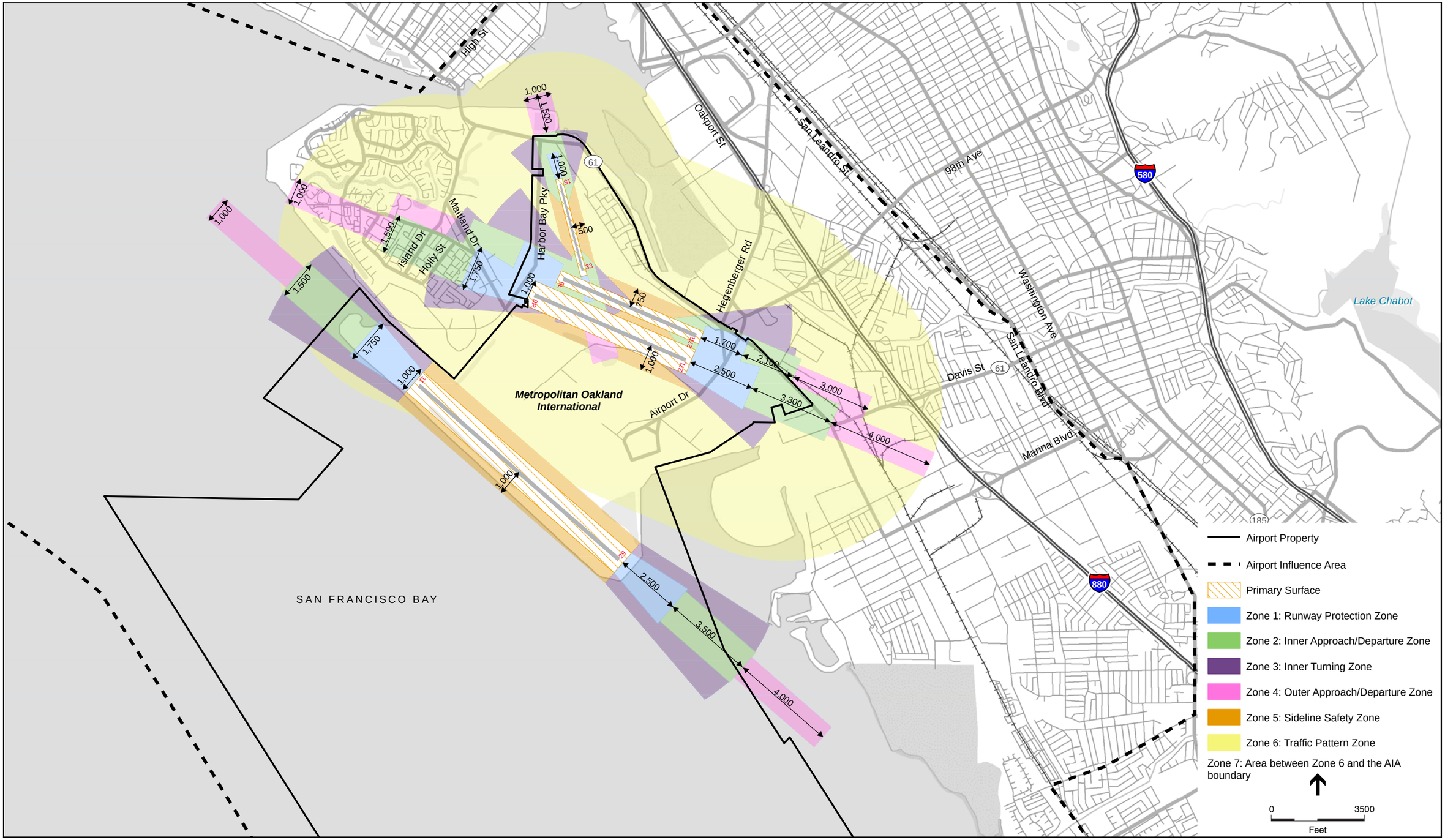
d) Although not mandated by state law, the recommendation of this ALUCP is that the airport proximity disclosure should be provided as part of all real estate transactions involving private property (both new and existing) within the airport influence area.



SOURCE: ESA Airports, ESRI, OAK Airport Master Plan, Caltrans California Airport Land Use Planning Handbook, 2002

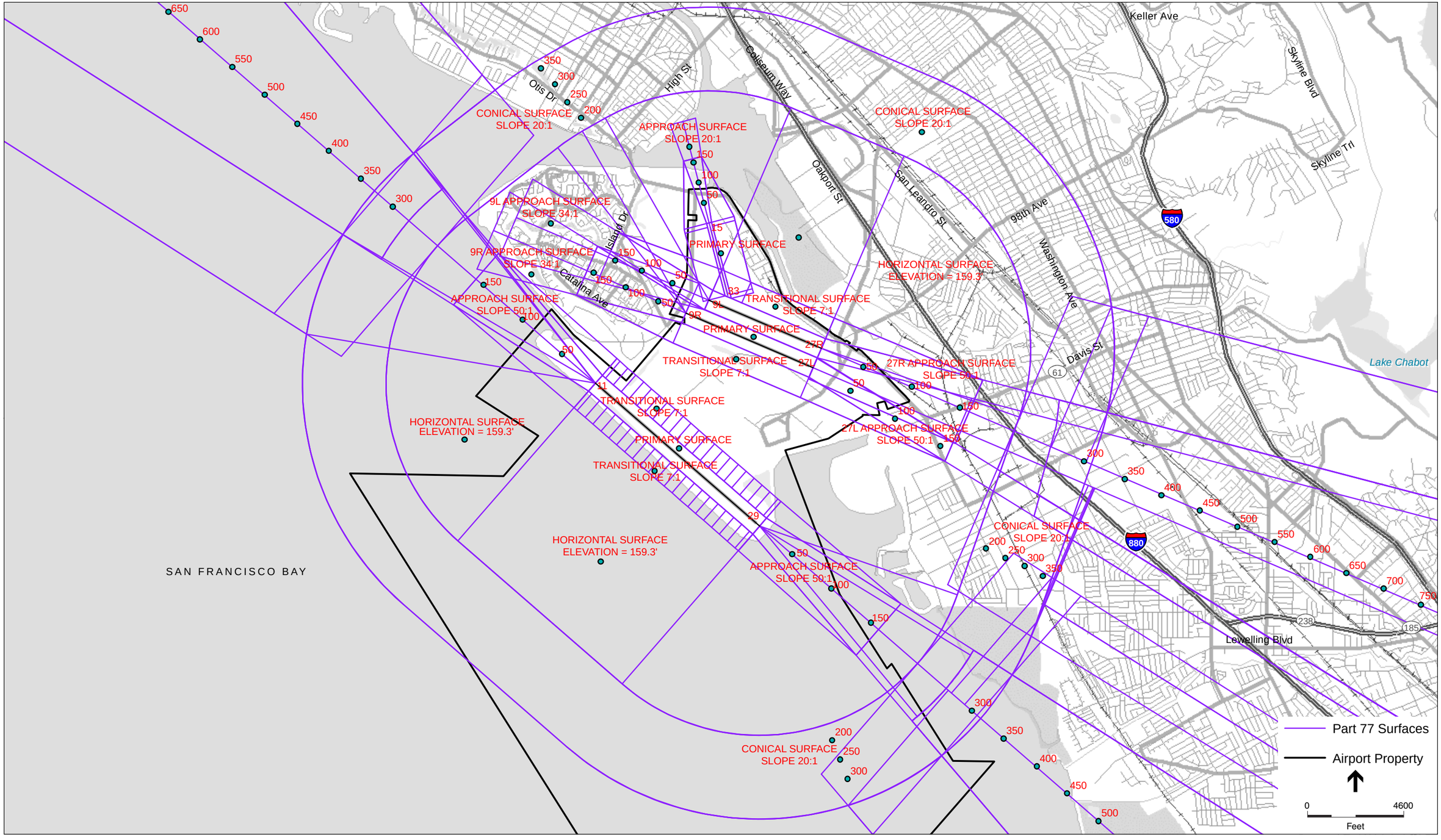
Oakland International Airport Land Use Plan Update . 202229

Figure 3-3
Noise Compatibility Zones



SOURCE: ESA Airports, ESRI, OAK Airport Master Plan, 2006, Caltrans California Airport Land Use Planning Handbook, 2002

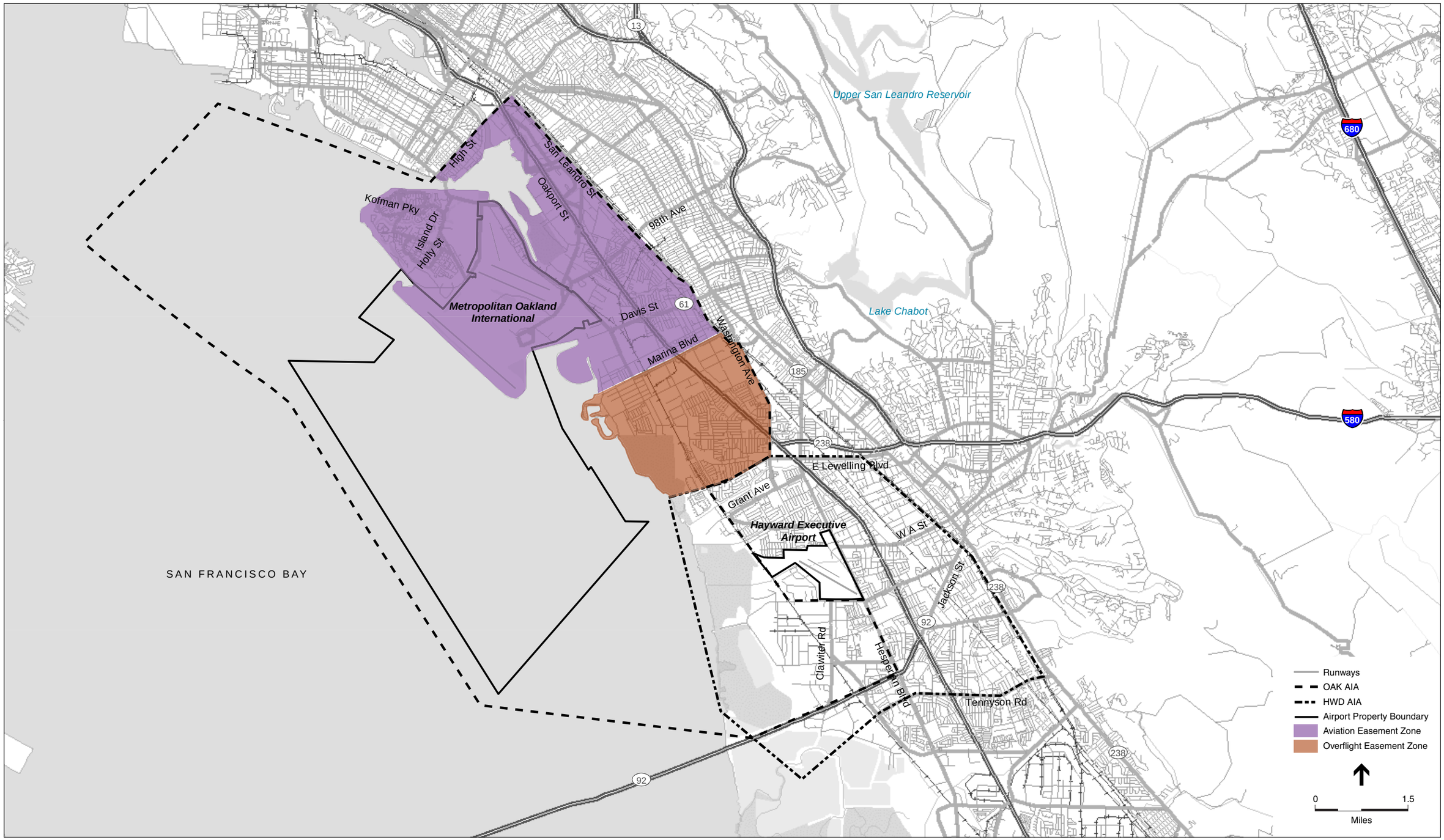
Figure 3-4
Safety Compatibility Zones



SOURCE: ESA Airports, ESRI, OAK Airport Master Plan, 2006

Figure 3-5

Oakland International Airport FAR Part 77 Sufaces



SOURCE: ESA Airports, ESRI, OAK Airport Master Plan, 2006

Figure 3-6
Overflight Compatibility Zones

CHAPTER 4
Oakland International Airport and Vicinity Data

4.1 Introduction

Oakland International Airport (OAK) is located in Alameda County approximately 7 nautical miles east of the City of San Francisco (see Figure 1-1). The Airport is situated on the southwestern edge of the City of Oakland, a city with a population of 397,067 residents as of 2006[1].

Construction of Oakland Municipal Airport (what is now North Field) began in June of 1927; part of which included the building of a 7,020 foot runway, the longest in the world for its day. Over the next 15 years leading up to World War II, multiple additions were made to the airport, including five hangars, passenger terminal/administrative offices, and a restaurant. During World War II, Oakland Municipal Airport was used as the marshalling point for all planes bound for the U.S. forces in the Pacific. In 1945, a parallel 6,200-foot east-west runway was constructed.

After World War II, OAK was returned to the Port of Oakland. In 1960, construction began on a new 10,000 foot jet runway and facilities complex south of the OAK's existing facilities. The new 600-acre complex would consist of a passenger terminal topped by a ten-story control tower, a separate air cargo building, and a jet hangar. In 1962, the new OAK facilities opened to the public. Since all the renovation in the 1960's, OAK has continued to grow, establishing itself as an important economic resource in the Bay Area. A second passenger terminal was completed in 1985 and expanded in 2007. OAK handled 14.5 million passengers and nearly 700,000 tons of air cargo in 2007.

4.2 Surrounding Airport Environs

4.2.1 Jurisdictions

Oakland International Airport (OAK) is owned and operated by the Port of Oakland, an autonomous department of the City of Oakland, under the exclusive control and management of the Board of Port Commissioners.

[1] U.S. Census Bureau, www.census.gov, 2007.

4.2.2 Adjacent and Surrounding Land Uses

Figures 4-1 and 4-2 represent generalized land uses and zoning, respectively, in the OAK AIA. Due to the fact that the cities of Alameda and Oakland combined their land use and zoning maps, the data presented in this figure has been generalized in order to fit the format of other jurisdictions within the AIA. More detailed land use maps are available through each jurisdiction encompassed by the OAK AIA.

OAK is bound to the east by Metropolitan Golf Links, Chuck Corica Municipal Golf Complex to the west, Doolittle Drive to the north, and San Francisco Bay to the west. As shown in Figure 4-1, land uses in the vicinity of OAK include commercial, industrial, and urban open-space uses. No residential uses are adjacent to airport property. Within the City of Oakland, heavy industrial uses predominate to the north and northeast of the airport, with two sports arenas and residential land uses beyond that. To the southeast is the City of San Leandro and a mix of natural, industrial, and residential land uses. Beyond the City of San Leandro is the unincorporated community of San Lorenzo, and south of San Lorenzo is the City of Hayward. Bay Farm Island, a residential community of the City of Alameda, is north of OAK.

To the north of OAK and within the City of Oakland, is the residential neighborhood of Elmhurst. Southeast of the airport in the City of San Leandro, are the neighborhoods of Little Alaska, Mulford Gardens, and Marina Faire; all of which are west of Doolittle Drive. Additional residential land uses in San Leandro, referred to as the Davis, Eastshore, Davis West, Cherrywood, Manor, and Bonaire neighborhoods, can be found either east or west of Interstate 880. Northwest of OAK is Bay Farm Island, a collection of residential neighborhoods which are a part of the City of Alameda. Polices and land use regulations associated with these neighborhoods are contained within land use elements or specific plans of the cities of Oakland, San Leandro, and Alameda.

In the eastern vicinity of OAK, the predominant zoning is industrial. Industrial uses near OAK can be found along Edgewater Drive, Oakport Street, and Pardee Drive in the City of Oakland. Commercial uses associated with Airport Business Park to the north of Hegenberger Road are owned by the Port of Oakland. One-family, apartment, and medium-density residential zoning are east and southeast of the airport. In the City of San Leandro, the primary zoning found within the vicinity of OAK is industrial, with a mix of residential multi-family and single-family districts as well. Further south, in the City of Hayward, the predominate zoning within the OAK AIA is industrial, with some single family residential, commercial, and planned development as well. The majority of zoning districts in the City of Alameda (including Bay Farm Island) is a mix of residential and commercial, with an emphasis on one-family residential uses towards the center of the community and general industrial zoning on the outskirts.

4.2.3 Alameda County Land Uses

The residential community of San Lorenzo, an unincorporated area of Alameda County, is located south of OAK. This unincorporated urban community is part of the Eden Planning Unit of the County and is zoned for single family residence (R-1) by the County (see Figure 4-2).

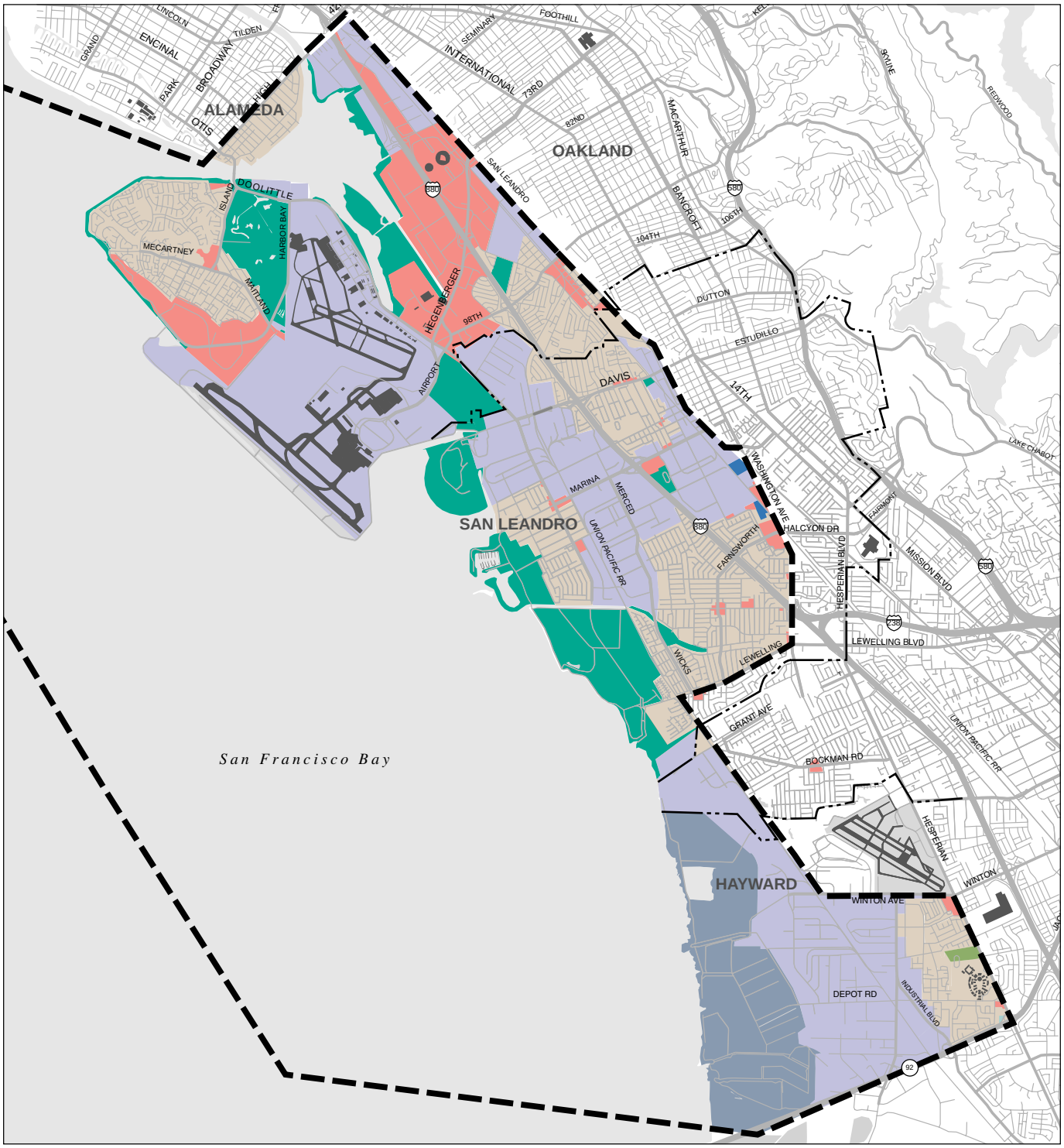
4.2.4 Noise-Sensitive Land Uses

The portion of the City of Oakland within OAK's AIA contains numerous noise-sensitive land uses. These include: Martin Luther King Jr. Regional Park, Brookfield Village Park, Columbian Gardens Park, Tyrone Carney Park, Sobrante Park, Brookfield Elementary School, Sobrante Park Elementary, Madison Middle School, and several places of worship.

Noise-sensitive land uses in the City of Alameda's Bay Farm Island community within OAK's AIA include: Tillman Park, Leydecker Park, Godfrey Park, Doc Harrington Park, Amelia Earhart Elementary, Chinese Christian School, a daycare center, and several places of worship.

South of the Airport, in the City of San Leandro, noise-sensitive land uses within the AIA include: Oyster Bay Regional Shoreline, Cherry Grove Park, Thrasher Park, Mulford Park, Pacific Recreation Complex, Marina Park, Bonaire Park, Floresta Park, Stenzel Park, Dayton Playground, Washington Manor Park, Lewelling Playground, Grover Cleveland School, John Muir Middle School, Woodrow Wilson Elementary School, Garfield Elementary School, Pacific High School, James Madison School, Corvallis Elementary, Monroe Elementary School, Marina High School, Saint Felicitas School, Redwood Christian High School, Washington Manor Elementary School, Burbank Preschool, and numerous places of worship.

Beyond the City of San Leandro, in the unincorporated community of San Lorenzo, noise-sensitive land uses within OAK's AIA include: Mervin Morris Park, Del Rey Park, San Lorenzo Park, Arroyo High School, Bay Elementary School, and Del Rey Elementary School.

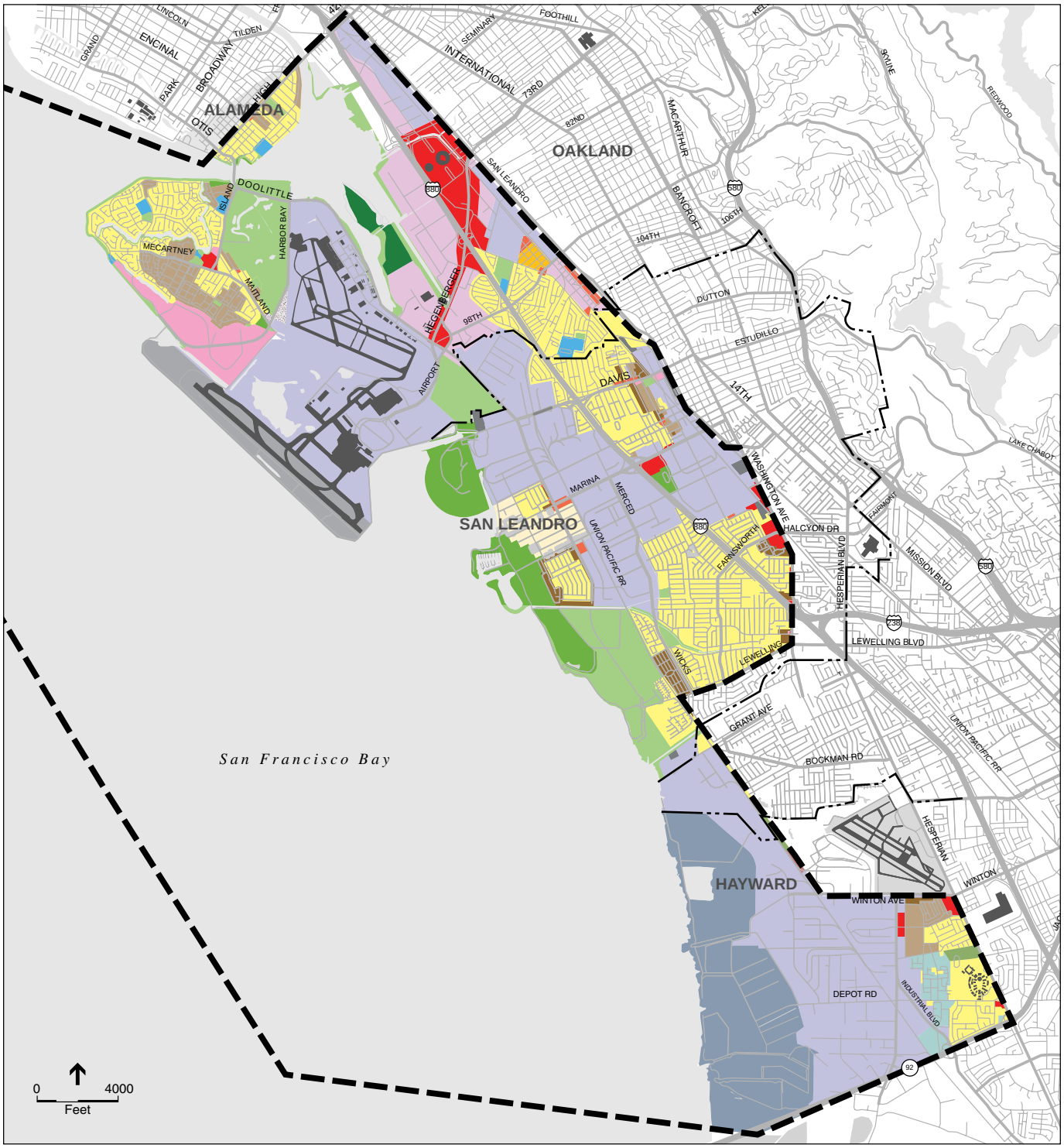


Residential
Commercial
Industrial
Agricultural
Public and Quasi-Public
Open Space
Flood Plain
Planned Development
Airport Influence Area
Jurisdictional Boundaries

0 4000
Feet

SOURCE: City of Alameda, 1991; City of Hayward, 2002; City of Oakland, 2005; City of San Leandro, 2002; County of Alameda, 2004; Thomas Brothers Maps; and ESA, 2007

Figure 4-1
Generalized Land Use in Vicinity of Oakland International Airport



SOURCE: City of Alameda, 2001; City of Hayward, 2007; City of Oakland, 2005; City of San Leandro, 2007; County of Alameda, 2004; Thomas Brothers Maps; and ESA, 2007

Figure 4-2
Generalized Zoning in Vicinity of Oakland International Airport

4.2.5 Future Airport Vicinity Land Uses

OAK is located in the southwestern portion of the City of Oakland, and the AIA includes portions of the cities of Alameda, San Leandro, and Hayward, as well as unincorporated areas of Alameda County. OAK is identified in the *City of Oakland General Plan's Land Use and Transportation Element* as part of the East Oakland planning area, which is an area bound by High Street to the north, I-580 to the east, the city border between Oakland and San Leandro to the south, and the San Francisco Bay to the west. The City's *General Plan* identifies portions of this planning area within OAK's AIA for development and re-development opportunities, which primarily involve commercial and industrial land uses. Residential uses, which primarily occur in the Elmhurst area, are identified in the *General Plan* for revitalization programs and urban design assistance, but further intensification is not recommended in the Plan.

Bay Farm Island, the portion of the City of Alameda within OAK's AIA, is predominately residential uses, with some commercial and industrial uses at the edges of Bay Farm Island.

4.3 Land Use Regulations and Policies

The State of California requires all local governments to enact a general plan which establishes policies to guide future development of the city or county. The policies of the general plan are implemented through ordinances regulating development, including the zoning ordinance, which regulates the use of land, the density of development, and the height and bulk of buildings. Local governments also regulate development through building codes which set detailed standards for construction.

This section summarizes goals, objectives, and policies of the Cities of Oakland, San Leandro, Alameda, and Hayward and Alameda County that are applicable to airport land use compatibility for OAK.

4.3.1 City of Oakland General Plan Land Use and Transportation Element, Adopted March of 1998, Amended through 2015

The *City of Oakland General Plan Land Use and Transportation Element* was updated in 1998. No significant changes to land use patterns are proposed as part of the *General Plan*. The *General Plan* designates land uses in the vicinity of the airport as commercial, light industrial, hotel, and office uses. The predominant zoning in the vicinity of OAK is industrial.

The *City of Oakland Land Use and Transportation Element* states the following airport land use compatibility related policies:

Seaport and Airport Objectives and Policies

W6.2 Development of sites proximate to airport flight paths should be in conformance with Federal and State standards, as articulated in Federal Aviation Regulation, Part 77 and Part 150, ALUC planning guidelines, and any other applicable regulations and amendments.

W7.1 Outside the seaport and airport, land should be developed with a variety of uses that benefit from the close proximity to the seaport and airport and that enhance the unique characteristics of the seaport and airport. These lands should be developed with uses which can buffer adjacent neighborhoods from impacts related to such activities.

W7.2 Other commercial and industrial uses should be encouraged at appropriate locations (Port-owned or not) where they can provide economic opportunity to the community at large.

Housing Production, Conservation, and Enhancement Objectives and Policies

N3.9 Residential developments should be encouraged to face the street and to orient their units to desirable sunlight and views, while avoiding unreasonably blocking sunlight and views for neighboring buildings, respecting the privacy needs of residents of the development and surrounding properties, providing for sufficient conveniently located on-site open space, and avoiding undue noise exposure.

Residential and Non-Residential Activities Objectives and Policies

N5.2 Residential areas should be buffered and reinforced from conflicting uses through the establishment of performance-based regulations, the removal of non-conforming uses, and other tools.

4.3.2 City of Oakland General Plan Noise Element, Adopted June 2005

The City of Oakland's original *General Plan Noise Element* was adopted in 1974. Since then, Oakland's land use patterns have changed, and its population and economy have expanded. In 2005, as a response to this growth, the City has updated the *Noise Element*, and many of its policies, in an effort to protect Oakland residents from exposure to excessive noise levels. Like most cities, the City of Oakland's major noise sources are transportation activities; specifically, motor vehicle traffic on major thoroughfares, rail activity, and operations from nearby airports.

The 2005 *City of Oakland General Plan Noise Element* includes a number of policies that are related to aircraft and airport noise. These include the following relevant policies:

Policy 1: Ensure the compatibility of existing and, especially, of proposed development projects not only with neighboring land uses, but also with their surrounding noise environment.

1.3 Continue working with the Alameda County Community Development Agency (in its role as the County's Airport Land Use Commission) and with the Port of Oakland to ensure consistency with the County's airport land use plan of the City's various master planning documents, zoning ordinance and land-use development proposals near Oakland's airport.

Policy 2: Protect the noise environment by controlling the generation of noise by both stationary and mobile noise sources.

2.3 Encourage the Port of Oakland to continue promoting its noise abatement office and programs for Oakland International Airport.

4.3.3 City of San Leandro General Plan, Adopted in 2002, Amended through 2015

The *City of San Leandro General Plan* was updated in 2002. No significant land use changes to land use patterns are proposed as part of the *General Plan*. The *General Plan* designates land uses in the vicinity of the airport as commercial uses, light industrial, and residential. The predominant zoning in the vicinity of OAK is industrial.

The *City of San Leandro General Plan* states the following airport land use compatibility related policies:

3.10 Conversion of Non-Residential Land to Housing and Public Uses

Encourage the development of new housing on underutilized commercial and industrial sites which meet the following criteria: …Sites which are not constrained by external environmental factors, including freeway, railroad, and airport noise.

37.01 Monitoring of Airport Plans

Actively and aggressively participate in forums and discussions regarding operations and expansion plans for Oakland International Airport. Seek local representation on task forces, commissions, and advisory boards established to guide airport policies and programs.

37.02 Mitigation of Airport Noise

Pursue mitigation of airport noise impacts to the fullest extent possible. Support and advocate for operational practices, changes to aircraft, new technologies, and physical improvements that would reduce the number of properties in San Leandro that are impacted by noise.

37.06 Airport Safety Zones

Regulate land uses within designated airport safety zones, height referral areas, and noise compatibility zones to minimize the possibility of future noise conflicts and accident hazards.

4.3.4 City of Alameda General Plan, Adopted in 1991, Amended through 2010

The *City of Alameda General Plan* was updated in 1991. No significant land use changes to land use patterns are proposed as part of the *General Plan*. The *General Plan* designates land uses in the vicinity of the airport as residential uses, commercial, and light industrial. The predominant zoning in the vicinity of OAK is residential.

4.3.4.1 Airport Environs Element

The *City of Alameda General Plan Airport Environs Element* states the following airport land use compatibility related policies:

Guiding Policies: Airport Impact Areas

7.2.a Regulate development in Alameda to minimize hazards in safety zones designated by the Alameda County Airport Land Use Commission.

7.2.b Do not approve incompatible development in noise/safety sensitive areas.

7.2.c Seek ways to ensure provision of effective sound mitigation for all housing units in noise impact areas.

7.2.e Ensure that purchasers of property currently or potentially subject to normally unacceptable noise levels are aware of such conditions, of City policies regarding mitigation, and of limitations to the City's ability to abate nuisances when such properties are subject to an avigation easement.

4.3.5 City of Hayward General Plan, Adopted 2002, Amended through July 15, 2003

The *City of Hayward General Plan* was updated in 2002. No significant changes to land use patterns are proposed as part of the *General Plan*. The *General Plan* designates land uses in the vicinity of airport as commercial uses, medium and high-density residential, hotel, commercial, and office uses within the Airport planning district.

The *City of Hayward General Plan* states the following airport land use compatibility related policies:

Guidelines for the Review of New Development:

A.1 Indoor noise level shall not exceed an Ldn of 45 dB in new housing units.

A.3 If the primary noise source is aircraft or a railroad, noise levels in new residential development exposed to an exterior Ldn of 60 dB or greater should be limited to a maximum instantaneous noise level in bedrooms at night of 50 dB(A). Maximum instantaneous noise levels in bedrooms during the daytime and in other rooms should not exceed 55 dB(A).

C. Locate noise-sensitive uses away from noise sources unless mitigation measures are included in development plans. Protect schools, hospitals, libraries, churches, convalescent homes, and other noise sensitive uses from noise levels exceeding those allowed in residential areas.

4.3.5.1 City of Hayward Noise Element Policies

The City of Hayward *General Plan Noise Element* states that "Other significant sources of noise in the community, including aircraft operations in the vicinity of the Hayward Executive Airport and at Oakland International Airport, railroad train operations along the Union Pacific Railroad lines, and the Bay Area Rapid Transit system are expected to remain essentially as they are today." Therefore, the same noise policies adopted in the 1986 City of Hayward *General Plan* continue to apply.

The 1986 City of Hayward *Noise Element* includes a number of policies that are related to aircraft and airport noise. These include the following relevant policies:

Policy: The City will seek to protect the public health, safety, and welfare against the adverse effects of excessive noise, consistent with the economic and environmental well-being of the City, and reaffirm desirability of quiet surroundings.

1. Provide educational material and assistance to the public regarding noise mitigation.

2. Maintain conformity of new development with the principles and standards for land use compatibility, noise exposure and noise mitigation contained in the Noise Element.

9. Continue to monitor the effectiveness of noise control programs at Hayward Executive Airport.

12. Encourage mitigation of noise through appropriate site planning, building orientation, interior layout and building materials.

4.3.6 Eden Area Plan, Alameda County, California, Updated March 2010

The Airport lies within the City of Oakland and is not subject to Alameda County *General Plan* policies. However, the following County policies are discussed since a portion of the unincorporated community of San Lorenzo lies within OAK's AIA. The unincorporated community of San Lorenzo is included as part of the *Eden Area Plan* prepared by Alameda County. The *Plan* is a statement of Alameda County's conservation and development policy for the Eden area. Land use designations in the vicinity of OAK in unincorporated Alameda County are predominantly suburban and low-density residential and limited neighborhood commercial along major arterials.

4.4 Existing Airport Land Uses

Existing and planned facilities at OAK are shown in Figure 4-3, which is the OAK airport layout plan (ALP). OAK is located on a 2,600-acre site approximately nine miles south of the City of Oakland's downtown area, and is in the City of Oakland's general industrial/transportation zoning district, which includes aviation-related commercial, industrial, and public uses. OAK is divided into two distinct areas: North Field and South Field.

4.4.1 North Field

OAK's North Field, which consists of two parallel runways 6,212 feet (Runway 9R/27L) and 5,454 feet (Runway 9L/27R) in length and a third crosswind runway (Runway 15/33), 3,372 feet in length, is used primarily for general aviation (GA) (i.e., non-air carrier) operations. North Field has its own Air Traffic Control Tower, and is also the location for all of OAK's fixed based operators (FBOs), including Kaiser Air and Business Jet Center, and general aviation hangars.

The approach path for Runway 15-33 consists of residential uses in the City of Alameda approximately 1.3 miles away with the San Leandro Bay in between. To the southwest of Runway 15-33 is airport property and the San Francisco Bay. Land uses west of Runway 9L-27R include a golf course and residential uses within approximately 1 mile of the runway end. East of Runway 9L-27R is another golf course and beyond that is industrial and residential land uses, located approximately 0.7 and 1.3 miles away from Runway 27R. The proximity of residential and industrial land uses to either end of Runway 9R-27L are nearly the same as that of Runway 9L-27R due to their parallel configuration.

4.4.2 South Field

OAK's South Field, which is defined as the area south of Ron Cowan Parkway, contains a single, 10,000-foot long runway (11/29), and is used primarily for air carrier passenger and cargo aircraft operations. The approach path for Runway 11-29 consists primarily of the San Francisco Bay.

South Field also includes approximately 208 acres of passenger facilities, including Terminals 1 (16 aircraft gates) and 2 (13 aircraft gates), the South Air Traffic Control Tower, and air cargo facilities (approximately 104 acres), the largest of which is the FedEx Metroplex (their west coast hub operation). North Field and South Field are connected by a single, north-to-south oriented taxiway (Taxiway B).

4.4.3 Typical Flight Procedures

The standard flight procedures as outlined by Oakland International Airport are as follows:

Runway 15-33. Aircraft departing Runway 33 must make a right, northerly turn over San Leandro Bay until reaching I-880 freeway and continue per ATC instructions. No straight or left crosswind/downwind departures are allowed. Straight in arrivals to Runway 15 are not recommended, unless required by safety or wind conditions.

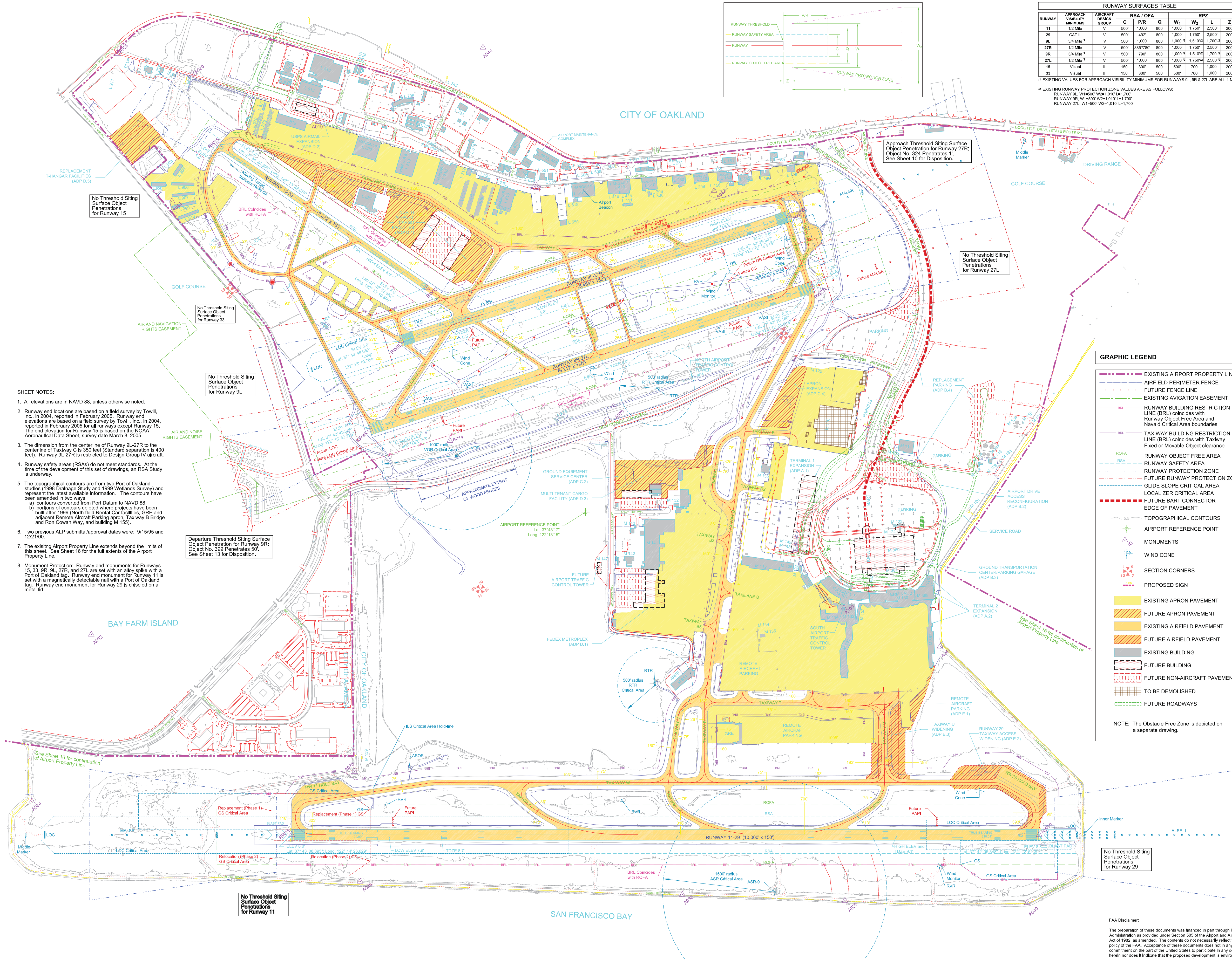
Runways 27R and 27L. Aircraft should only depart Runways 27R and 27L by making a right crosswind turn over San Leandro Bay until reaching I-880 freeway and continue per ATC instructions. Straight out departures are not recommended. At night, runway 27R is one of two preferred departure runways. Runway 27L is the preferred nighttime arrival runway.

Runways 09R and 09L. There are no daytime departure restrictions for runways 09R and 09L. At night, runway 9R is one of two preferred departure runways, no left turns are allowed from either 09R or 09L, and no straight out departures are allowed from runway 09L.

Runway 11-29. Air traffic controllers do not instruct jet aircraft over the Oakland Hills below 3,000 feet. VFR aircraft that depart Runway 29 and request a right turn are instructed to proceed at least 2 miles west or climb to at least 1,500 feet before turning right. The Quiet Runway 11 departure procedure requires that turbojets turn to the right and further out over the Bay when departing Runway 11. Air traffic controllers assign a left turn heading, or Silent7 departure procedure, to all IFR turbo-jet aircraft departing Runway 29 from 10:00 P.M. to 7:00 A.M. daily.

Oakland International Airport mandates that aircraft performing training touch-and-go procedures on the North Field use Runway 27L as the preferred runway for these procedures and fly the standard traffic pattern to avoid flying over residential areas as much as possible. Touch-and-go operations are prohibited between the hours of 10:00 p.m. and 6:00 a.m. Turbojet aircraft practicing instrument approaches south of OAK are to remain over the Bay when using Runway 29.

In addition to the procedures listed above, OAK recommends that pilots avoid overflying residential neighborhoods, gaining as much altitude as quickly as practical, and adjusting the propeller angle and engine speed to reduce engine and propeller noise.



RUNWAY SURFACES TABLE

RUNWAY	APPROACH VISIBILITY MINIMUMS	AIRCRAFT DESIGN GROUP	RSA / OFA C	RSA / OFA P/R	RSA / OFA Q	RPZ W_1	RPZ W_2	RPZ L	RPZ Z
11	1/2 Mile	V	500'	1,000'	800'	1,000'	1,750'	2,500'	200'
29	CAT III	V	500'	492'	800'	1,000'	1,750'	2,500'	200'
9L	3/4 Mile/1	IV	500'	1,000'	800'	1,000'/2	1,510'/2	1,700'/2	200'
27R	1/2 Mile	IV	500'	885'/780'	800'	1,000'	1,750'	2,500'	200'
9R	3/4 Mile/1	V	500'	790'	800'	1,000'/2	1,510'/2	1,700'/2	200'
27L	1/2 Mile/1	V	500'	1,000'	800'	1,000'/2	1,750'/2	2,500'/2	200'
15	Visual	II	150'	300'	500'	500'	700'	1,000'	200'
33	Visual	II	150'	300'	500'	500'	700'	1,000'	200'

/1 EXISTING VALUES FOR APPROACH VISIBILITY MINIMUMS FOR RUNWAYS 9L, 9R & 27L ARE ALL 1 MILE.

/2 EXISTING RUNWAY PROTECTION ZONE VALUES ARE AS FOLLOWS:
RUNWAY 9L, W1=500' W2=1,010' L=1,700'
RUNWAY 9R, W1=500' W2=1,010' L=1,700'
RUNWAY 27L, W1=500' W2=1,010' L=1,700'

SHEET NOTES:

1. All elevations are in NAVD 88, unless otherwise noted.
2. Runway end locations are based on a field survey by Towill, Inc., in 2004, reported in February 2005. Runway end elevations are based on a field survey by Towill, Inc., in 2004, reported in February 2005 for all runways except Runway 15. The end elevation for Runway 15 is based on the NOAA Aeronautical Data Sheet, survey date March 8, 2005.
3. The dimension from the centerline of Runway 9L-27R to the centerline of Taxiway C is 350 feet (Standard separation is 400 feet). Runway 9L-27R is restricted to Design Group IV aircraft.
4. Runway safety areas (RSAs) do not meet standards. At the time of the development of this set of drawings, an RSA Study is underway.
5. The topographical contours are from two Port of Oakland studies (1998 Drainage Study and 1999 Wetlands Survey) and represent the latest available information. The contours have been amended in two ways:
   a) contours converted from Port Datum to NAVD 88,
   b) portions of contours deleted where projects have been built after 1999 (North field Rental Car facilities, GRE and adjacent Remote Aircraft Parking apron, Taxiway B Bridge and Ron Cowan Way, and building M 155).
6. Two previous ALP submittal/approval dates were: 9/15/95 and 12/21/00.
7. The existing Airport Property Line extends beyond the limits of this sheet. See Sheet 16 for the full extents of the Airport Property Line.
8. Monument Protection: Runway end monuments for Runways 15, 33, 9R, 9L, 27R, and 27L are set with an alloy spike with a Port of Oakland tag. Runway end monument for Runway 11 is set with a magnetically detectable nail with a Port of Oakland tag. Runway end monument for Runway 29 is chiseled on a metal lid.

BUILDING DATA TABLE

Building Number	Description	Building Elevation (feet)
GRE	Ground Runup Enclosure	52
BLLN	Balloon Station	24
L 105	Education	24
L 107	Offices	36
L 118	Sales and Service	37
L 130	Education	43
L 142	Executive Terminal	40
L 150	Hangar #1	50
L 151	Office and Warehouse	25
L 156	Storage Shed	18
L 158	Storage Shed	16
L 160	Storage	41
L 209	Storage Shed	
L 210	Hangar #2	59
L 230	Cargo Operations	40
L 231	Storage	21
L 306	T-Hangar	25
L 310	Hangar #3	55
L 311	Office and Garage	25
L 315	Utility Shop	21
L 317	Storage	16
L 403	Pump House	23
L 410	Hangar #4	56
L 411	Flight Service	26
L 414	Shop	
L 416	Aircraft Repair	
L 501	PG&E Switch House	13
L 503	Fuel Racks	
L 505	Shed	13
L 508	Storage Shed	14
L 510	Hangar #5	69
L 518	Storage	27
L 550	Executive Terminal	25
L 551	Repair	19
L 552	Engine Repair	25
L 553	Manufacturing	33
L 591	Offices	34
L 595	Shops	47
L 597	Vehicle Maintenance	47
L 599	Warehouse	38
L 606	Offices	28
L 608	Guard Shack	13
L 610	Hangar #6	85
L 611A	Port-A-Port Hangars Row A	20
L 611B	Port-A-Port Hangars Row B	21
L 611C	Port-A-Port Hangars Row C	18
L 611D	Port-A-Port Hangars Row D	19
L 613	Rental Car Service/QTA	24
L 617	Offices	24
L 618	Offices	24
L 619	FAA Service Maintenance Organization (SMO) offices; Auditorium	29
L 621	Museum	41
L 705	Interim Rental Car Customer Service	34
L 710	Hangar #7	55
L 712	Offices and Hangar	27
L 745	Pumphouse	29
L 747	Rental Car Service/QTA	32
L 810	Hangar #8	54
L 812	Postal Service	33
L 814	Offices and Shop	30
L 815	Offices	45 E/41W
L 819	Repair	42
L 820	Hangar #9	63
L 825	Education	37
L 827	FAA Bay Data Distribution Hub	39
L 828	FAA Automated Flight Service Station	35
L 831A	Storage	31
L 831B	Storage	31
L 877	Aircraft Wash Building	18
L 878	T-Hangars	15
L 879	T-Hangars	14
L 880	T-Hangars	15
L 881	Hangar	51
L 900	Engine Test Cell	27
L 902	Pump House	20
L 904	North Airport Traffic Control Tower	101
L 905	Hangars	23
L 906	Hangars	17
L 907	Hangars	17
L 908	Hangars	24
L 909	Hangars	17
L 910	Hangars	17
L 911	Soccer Field (no building)	not applicable
L 914	Engine Test Cell	43
L 916	Transformer Vault	18
L 921	Storage	13
L 922	Storage	13
L 923	Storage	13
L 924	Concrete Fuel Tank Building	18
L 927	Test Cell	47
L 928	Restrooms	14
M 101	Passenger Terminal (T1)	43
M 102	Passenger Terminal	52
-	South Airport Traffic Control Tower	161
M 103	Terminal 1 Concourse	80
M 104	Security Operations and Mechanical Equipment	40
M 105	Car Rental (to be domolished)	26
M 106	Cargo Operations	33
M 107	Storage	15
M 109	Control Room	18
M 110	Hangar (to be demolished)	123
M 111	Catering	31
M 112	Cargo Operations	36
M 114	Passenger Terminal and FIS	37
M 115	Motor Control House	15
M 116	Transportation Shelter at T1	33
M 121	Fuel Farm	not applicable
M 122	Blast Fence Area	39
M 123	Offices	22
M 124	Parking Payment Shelter	22
M 126	Pump House	29
M 128	Emergency Equipment	33
M 129	Storage Shed	19
M 130	Passenger Terminal (T2)	59
M 131	Transportation Shelter at T2	32
M 132	Cargo Operations	51
M 133	Fuel Pumps	not applicable
M 135	Fuel Pump Canopy	25
M 136	Fuel Farm	not applicable
M 137	Fuel Farm	not applicable
M 139	Pump House	29
M 141	Cargo Operations	71
M 142	Truck Maintenance	38
M 143	Guard House	24
M 144	Offices	21
M 146	Storage	23
M 147	Future Airport Traffic Control Tower	264 proposed
M 148	Offices	19
M 149	Offices	20
M 152	Terminal Connector	46
M 155	Warehouse/Provisioning Building	40
M 360	Future Parking Garage	not available
M 361	Future Offices and Rental Car Customer Service	not available
M 362	Future Pedestrian Bridge	not available
M 367	Terminal 2 Concourse	61
M 368	Inbound Baggage	40
M 371	Mechanical Building	55
M 911	ARFF Operations	39
BART	Future BART Connector	not available
BSTAT	Future BART Connector Station	not available

BUILDING NOTES:

1. **Future structures are subject to change.**
2. **Building elevations are to the highest point and have a vertical uncertainty of +/-2 feet.**
3. **Building elevations are in NAVD 88.**

FAA Disclaimer:

The preparation of these documents was financed in part through Federal Aviation Administration as provided under Section 505 of the Airport and Airway Improvement Act of 1982, as amended. The contents do not necessarily reflect the official views or policy of the FAA. Acceptance of these documents does not in any way constitute a commitment on the part of the United States to participate in any development depicted herein nor does it indicate that the proposed development is environmentally acceptable in accordance with appropriate public laws.

SOURCE: Port of Oakland, 2006; and ESA, 2007

Figure 4-3
Airport Layout Plan

4.5 Proposed Airport Facility Improvements[2]

4.5.1 Airfield

The *Oakland International Airport Master Plan* makes several recommendations for improving the airfield at OAK. In order to improve safety by minimizing the number of runway crossings required for an aircraft that lands on runway 27L, the *Master Plan* recommends constructing a new taxiway to run parallel with runway 9R-27L. The *Master Plan* also suggests adding a parallel North Field-South Field taxiway connection that would be designed to alleviate taxi times and delays. The *Master Plan* also estimates the demand for future remote (off-gate, on-Airport) remote overnight aircraft parking shall grow in the coming years, requiring an additional 23 to 46 acres of parking apron.

4.5.2 Building Area

The *Oakland International Master Plan* estimates that by the year 2025 approximately 30 million annual passengers will pass through OAK. In order to accommodate this growth, the *Master Plan* proposes that a total of 46 to 50 aircraft gates will be need to be built on the South Field, and that additional gates would require approximately 33 to 55 acres. Multiple terminal development scenarios were also proposed in the *Master Plan*, with a recommendation being made to develop future terminals on Airport property near the existing passenger facilities. According to OAK staff, the economic recession of 2008 – 2009 resulted in a significant decline in passengers and operations at OAK; therefore, additional terminal capacity may be required later than originally forecasted by the *Master Plan*.

Anticipation for the growth of air cargo operations at OAK is modest, and this is reflected in the *Master Plan*. Conservative recommendations are made for the expansion of existing FedEx facilities, south of Ron Conway Parkway and north of the existing FedEx Metroplex. Additional expansion is also considered for the existing air cargo area at South Field and the Oakland Maintenance Center site.

The *Master Plan* estimates that by 2025, and additional 14 to 29 acres of land would be required to base jets and turboprops at OAK. Projections, however, do not anticipate the need for additional land for piston aircraft and helicopters beyond 2010. Several recommendations for the development of general aviation facilities (i.e., large hangars for jets and turboprops, T-hangars for piston aircraft, and associated ramp area) are made by the *Master Plan*, with an emphasis focusing on constructing facilities in the northwest corner of the Airport, and in two areas parallel to Runway 15-33.

All development concepts proposed in the *Master Plan* occur within existing Airport boundaries. While these recommendations are made in the anticipation of future increased operations at OAK, they would not require the expansion of airport property.

[2] Airport facility improvements are described in greater detail in the *Oakland International Airport Master Plan*.

4.6 Airport Planning Documents

4.6.1 Oakland International Airport Master Plan

The *Oakland International Airport Master Plan* was adopted by the Port of Oakland's Board of Port Commissioners in March 2006. The plan includes an inventory of existing facilities and activity at the airport, forecasts of future airport activity, a projection of aviation facility needs, a presentation of development alternatives, a financial plan, and environmental considerations.

4.7 Existing and Future Airport Activity

The *Oakland International Airport Master Plan* has a 20-year forecasting horizon (2005 – 2025), but for the purpose of development recommendations, much of the analysis in the Master Plan is "near-term" (2010 and 2012).

4.7.1 Fleet Mix

Approximately 175 general aviation aircraft park in hangars at the North Field, and approximately 102 general aviation aircraft tie-down on the North Field ramps. The Master Plan offers an "unconstrained" forecast of future number of the based fleet mix at North Field, leaving out any assumptions in regards to the availability of existing and/or future facilities (see Table 4-1).

TABLE 4-1
EXISTING AND FORECAST BASED GENERAL AVIATION FLEET MIX

	Existing (2004)	2010	2025
General Aviation Aircraft Type			
Helicopter	6	14	14
Jet	29	36	58
Piston	228	320	320
Turboprop	14	14	14
Total	277	384	406

Source: *Oakland International Airport Master Plan*, 2006.

4.7.2 Operations

In terms of General Aviation activity, the OAK Master Plan projects that piston aircraft operations will decrease by one percent each year, while jet and helicopter operations are expected to increase in the near term due to the opening of a helicopter school, and then level off. The number of turboprop operations is not expected to change over the planning horizon (see Table 4-2).

TABLE 4-2
PROJECTED OPERATIONS BY AIRCRAFT TYPE

	2004 Operations	2010 Operations
General Aviation Aircraft Type		
Helicopter	2,704	35,507
Jet	16,574	19,937
Piston	103,542	97,238
Turboprop	5,822	5,822
Total	128,642	158,504

Source: *Oakland International Airport Master Plan*, 2006.

Table 4-3 presents forecasted airline passenger and air cargo activity.

TABLE 4-3
AIRLINE PASSENGER AND AIR CARGO FORECASTED OPERATIONS

	2004 Operations	2010 Operations
Airline Passengers		
Million Airline Passengers	14.1	18
Planning Day Passengers (Average Day, Peak Month)	43,745	56,047
Daily Operations	430	542
Percent of Daily Total Operations	45.8%	47.5%
Air Cargo		
Million Annual Tons	0.74	0.9
Daily Operations	156	164
Percent of Total Daily Operations	16.6%	14.4%

Source: *Oakland International Airport Master Plan*, 2006.

This page left intentionally blank.

CHAPTER 5
References

California Building Standards Commission, *2001 California Building Code*, California Code of Regulations, Title 24, effective November 2002.

California Department of Transportation, Division of Aeronautics, *California Airport Land Use Planning Handbook*, January 2002.

California Department of Transportation, *California Airport Land Use Commission Laws*, Public Utility Code 21670, February 2007.

City of Alameda, *City of Alameda General Plan*, adopted 1991.

City of Hayward, *City of Hayward General Plan*, adopted July 2002.

City of Oakland, *City of Oakland General Plan, Land Use and Transportation Element*, adopted March 1998.

City of San Leandro, *City of San Leandro General Plan*, adopted 2002.

County of Alameda, *Unincorporated Eden Area Plan*, adopted November 1983.

FAA, Advisory Circular (AC) 150/5390 – 2B, *Heliport Design*, September 30, 2004.

FAA, Federal Aviation Regulation (FAR) Part 77: *Objects Affecting Navigable Airspace*, 2007.

Horvath, C. October 31, 2006. Personal communication (email) from Alameda County regarding heliport locations transmitted to L. Harmon, ESA. Sacramento, California.

Mead & Hunt, *Borrego Valley Airport Land Use Compatibility Plan*, December 2006.

This page left intentionally blank.

Appendices

Appendix A

California Airport Land Use Commission Laws Public Utility Code Section 21670

ESA

APPENDIX A

California Airport Land Use Commission Laws Public Utility Code Section 21670

A.1 Creation; Membership; Selection

21670

(a) The Legislature hereby finds and declares that:

(1) It is in the public interest to provide for the orderly development of each public use airport in this state and the area surrounding these airports so as to promote the overall goals and objectives of the California airport noise standards adopted pursuant to Section 21669 and to prevent the creation of new noise and safety problems.

(2) It is the purpose of this article to protect public health, safety, and welfare by ensuring the orderly expansion of airports and the adoption of land use measures that minimize the public's exposure to excessive noise and safety hazards within areas around public airports to the extent that these areas are not already devoted to incompatible uses.

(b) In order to achieve the purposes of this article, every county in which there is located an airport which is served by a scheduled airline shall establish an airport land use commission. Every county, in which there is located an airport which is not served by a scheduled airline, but is operated for the benefit of the general public, shall establish an airport land use commission, except that the board of supervisors of the county may, after consultation with the appropriate airport operators and affected local entities and after a public hearing, adopt a resolution finding that there are no noise, public safety, or land use issues affecting any airport in the county which require the creation of a commission and declaring the county exempt from that requirement. The board shall, in this event, transmit a copy of the resolution to the Director of Transportation. For purposes of this section, "commission" means an airport land use commission. Each commission shall consist of seven members to be selected as follows:

(1) Two representing the cities in the county, appointed by a city selection committee comprised of the mayors of all the cities within that county, except that if there are any cities contiguous or adjacent to the qualifying airport, at least one representative shall be appointed there from. If there are no cities within a county, the number of representatives provided for by paragraphs (2) and (3) shall each be increased by one.

(2) Two representing the county, appointed by the board of supervisors.

(3) Two having expertise in aviation, appointed by a selection committee comprised of the managers of all of the public airports within that county.

(4) One representing the general public, appointed by the other six members of the commission.

(c) Public officers, whether elected or appointed, may be appointed and serve as members of the commission during their terms of public office.

(d) Each member shall promptly appoint a single proxy to represent him or her in commission affairs and to vote on all matters when the member is not in attendance. The proxy shall be designated in a signed written instrument which shall be kept on file at the commission offices, and the proxy shall serve at the pleasure of the appointing member. A vacancy in the office of proxy shall be filled promptly by appointment of a new proxy.

(e) A person having an "expertise in aviation" means a person who, by way of education, training, business, experience, vocation, or avocation has acquired and possesses particular knowledge of, and familiarity with, the function, operation, and role of airports, or is an elected official of a local agency which owns or operates an airport.

(f) It is the intent of the Legislature to clarify that, for the purposes of this article, special districts, school districts, and community college districts are included among the local agencies that are subject to airport land use laws and other requirements of this article.

A.2 Action by Designated Body Instead of Commission

21670.1

(a) Notwithstanding any other provision of this article, if the board of supervisors and the city selection committee of mayors in the county each makes a determination by a majority vote that proper land use planning can be accomplished through the actions of an appropriately designated body, then the body so designated shall assume the planning responsibilities of an airport land use commission as provided for in this article, and a commission need not be formed in that county.

(b) A body designated pursuant to subdivision (a) which does not include among its membership at least two members having an expertise in aviation, as defined in subdivision (e) of Section 21670, shall, when acting in the capacity of an airport land use commission, be augmented so that that body, as augmented, will have at least two members having that expertise. The commission shall be constituted pursuant to this section on and after March 1, 1988.

(c) (1) Notwithstanding subdivisions (a) and (b), and subdivision (b) of Section 21670, if the board of supervisors of a county and each affected city in that county each makes a determination that proper land use planning pursuant to this article can be accomplished pursuant to this subdivision, then a commission need not be formed in that county.

(2) If the board of supervisors of a county and each affected city makes a determination that proper land use planning may be accomplished and a commission is not formed pursuant to paragraph (1) of this subdivision, that county and the appropriate affected cities having jurisdiction over an airport, subject to the review and approval by the Division of Aeronautics of the department, shall do all of the following:

(A) Adopt processes for the preparation, adoption, and amendment of the comprehensive airport land use plan for each airport that is served by a scheduled airline or operated for the benefit of the general public.

(B) Adopt processes for the notification of the general public, landowners, interested groups, and other public agencies regarding the preparation, adoption, and amendment of the comprehensive airport land use plans.

(C) Adopt processes for the mediation of disputes arising from the preparation, adoption, and amendment of the comprehensive airport land use plans.

(D) Adopt processes for the amendment of general and specific plans to be consistent with the comprehensive airport land use plans.

(E) Designate the agency that shall be responsible of the preparation, adoption, and amendment of each comprehensive airport land use plan.

(3) The Division of Aeronautics of the department shall review the processes adopted pursuant to paragraph (2), and shall approve the processes if the division determines that the processes are consistent with the procedure required by this article and will do all of the following:

(A) Result in the preparation, adoption, and implementation of plans within a reasonable amount of time.

(B) Rely on the height, use, noise, safety, and density criteria that are compatible with airport operations, as established by this article, and referred to as the Airport Land Use Planning Handbook, published by the division, and any applicable federal aviation regulations, including, but not limited to, Part 77 (commencing with Section 77.1) of Title 14 of the Code of Federal Regulations.

(C) Provide adequate opportunities for notice to, review of, and comment by the general public, landowners, interested groups, and other public agencies.

(4) If the county does not comply with the requirements of paragraph (2) within 120 days, then the plan and amendments shall not be considered adopted pursuant to this article and a commission shall be established within 90 days of the determination of noncompliance by the division and a plan shall be adopted pursuant to this article within 90 days of the establishment of the commission.

(d) A commission need not be formed in a county that has contracted for the preparation of comprehensive airport land use plans with the Division of Aeronautics under the California Aids to Airport Program (Title 21 (commencing with Section 4050) of the California Code of Regulations), Project Ker-VAR 90-1, and that submits all of the following information to the Division of Aeronautics for review and comment that the county and the cities affected by the airports within the county, as defined by the plans:

(1) Agree to adopt and implement the comprehensive airport plans that have been developed under contract.

(2) Incorporated the height, use, noise, safety, and density criteria that are compatible with airport operations as established by this article, and referred to as the Airport Land Use Planning Handbook, published by the division, and any applicable federal

aviation regulations, including, but not limited to, Part 77 (commencing with Section 77.1) of Title 14 of the Code of Federal Regulations as part of the general and specific plans for the county and for each affected city.

(3) If the county does not comply with this subdivision on or before May 1, 1995, then a commission shall be established in accordance with this article.

(e) (1) A commission need not be formed in a county if all of the following conditions are met:

(A) The county has only one public use airport that is owned by a city.

(B) (i) The county and the affected city adopt the elements in paragraph (2) of subdivision (d), as part of their general and specific plans for the county and the affected city.

(ii) The general and specific plans shall be submitted, upon adoption, to the Division of Aeronautics. If the county and the affected city do not submit the elements specified in paragraph (2) of subdivision (d), on or before May 1, 1996, then a commission shall be established in accordance with this article.

A.3 Application to Counties Having Over 4 Million Population

21670.2

(a) Sections 21670 and 21670.1 do not apply to the County of Los Angeles. In that county, the county regional planning commission has the responsibility for coordinating the airport planning of public agencies within the county. In instances where impasses result relative to this planning, an appeal may be made to the county regional planning commission by any public agency involved. The action taken by the county regional planning commission on such an appeal may be overruled by a four-fifths vote of the governing body of a public agency whose planning led to the appeal.

(b) By January 1, 1992, the county regional planning commission shall adopt the comprehensive land use plans required pursuant to Section 21675.

(c) Sections 21675.1, 21675.2, and 21679.5 do not apply to the County of Los Angeles until January 1, 1992. If the comprehensive land use plans required pursuant to Section 21675 are not adopted by the county regional planning commission by January 1, 1992, Sections 21675.1 and 21675.2 shall apply to the County of Los Angeles until the plans are adopted.

21670.3

(a) Sections 21670 and 21670.1 do not apply to the County of San Diego. In that county, San Diego County Regional Airport Authority, as established pursuant to Section 170002, is responsible for coordinating the airport planning of public agencies within the county and shall, on or before June 30, 2005, after reviewing the existing airport land use compatibility plan adopted pursuant to Section 21675, adopt an airport land use compatibility plan.

(b) Any airport land use compatibility plan developed pursuant to Section 21675 and adopted pursuant to Section 21675.1 by the San Diego Association of Governments shall remain in effect until June 30, 2005, unless the San Diego County Regional Airport Authority adopts a plan prior to that date pursuant to subdivision (a).

A.4 Intercounty Airports

21670.4

(a) As used in this section, "intercounty airport" means any airport bisected by a county line through its runways, runway protection zones, inner safety zones, inner turning zones, outer safety zones, or sideline safety zones, as defined by the department' s Airport Land Use Plan handbook and referenced in the comprehensive land use plan formulated under Section 21675.

(b) It is the purpose of this section to provide the opportunity to establish a separate airport land use commission so that an intercounty airport may be served by a single airport land use planning agency, rather than having to look separately to the airport land use commissions of the affected counties.

(c) In addition to the airport land use commissions created under Section 21670 or the alternatives established under Section 21670.1, for their respective counties, the boards of supervisors and city selection committees for the affected counties, by independent majority vote of each county's two delegations, for any intercounty airport, may do either of the following:

(1) Establish a single separate airport land use commission for that airport. That commission shall consist of seven members to be selected as follows:

(A) One representing the cities in each of the counties, appointed by that county's city selection committee.

(B) One representing each of the counties, appointed by the board of supervisors of each county.

(C) One from each county having expertise in aviation, appointed by a selection committee comprised of the managers of all the public airports within that county.

(D) One representing the general public, appointed by the other six members of the commission.

(2) In accordance with subdivision (a) or (b) of Section 21670.1, designate an existing appropriate entity as that airport's land use commission.

A.5 Airport Owned by a City, District, or County

21671

In any county where there is an airport operated for the general public which is owned by a city or district in another county or by another county, one of the representatives provided by paragraph (1) of subdivision (b) of Section 21670 shall be appointed by the city selection

committee of mayors of the cities of the county in which the owner of that airport is located, and one of the representatives provided by paragraph (2) of subdivision (b) of Section 21670 shall be appointed by the board of supervisors of the county in which the owner of that airport is located.

A.6 Term of Office

21671.5

(a) Except for the terms of office of the members of the first commission, the term of office of each member shall be four years and until the appointment and qualification of his or her successor. The members of the first commission shall classify themselves by lot so that the term of office of one member is one year, of two members is two years, of two members is three years, and of two members is four years. The body which originally appointed a member whose term has expired shall appoint his or her successor for a full term of four years. Any member may be removed at any time and without cause by the body appointing that member. The expiration date of the term of office of each member shall be the first Monday in May in the year in which that member's term is to expire. Any vacancy in the membership of the commission shall be filled for the unexpired term by appointment by the body which originally appointed the member whose office has become vacant. The chairperson of the commission shall be selected by the members thereof.

(b) Compensation, if any, shall be determined by the board of supervisors.

(c) Staff assistance, including the mailing of notices and the keeping of minutes and necessary quarters, equipment, and supplies shall be provided by the county. The usual and necessary operating expenses of the commission shall be a county charge.

(d) Notwithstanding any other provisions of this article, the commission shall not employ any personnel either as employees or independent contractors without the prior approval of the board of supervisors.

(e) The commission shall meet at the call of the commission chairperson or at the request of the majority of the commission members. A majority of the commission members shall constitute a quorum for the transaction of business. No action shall be taken by the commission except by the recorded vote of a majority of the full membership.

(f) The commission may establish a schedule of fees necessary to comply with this article. Those fees shall be charged to the proponents of actions, regulations, or permits, shall not exceed the estimated reasonable cost of providing the service, and shall be imposed pursuant to Section 66016 of the Government Code. Except as provided in subdivision (g), after June 30, 1991, a commission which has not adopted the comprehensive land use plan required by Section 21675 shall not charge fees pursuant to this subdivision until the commission adopts the plan.

(g) In any county which has undertaken by contract or otherwise completed land use plans for at least one-half of all public use airports in the county, the commission may continue to charge fees necessary to comply with this article until June 30, 1992, and, if the land use plans are complete by that date, may continue charging fees after June 30, 1992. If the land use plans are not complete by June 30, 1992, the commission shall not charge fees pursuant to subdivision (f) until the commission adopts the land use plans.

A.7 Rules and Regulations

21672

Each commission shall adopt rules and regulations with respect to the temporary disqualification of its members from participating in the review or adoption of a proposal because of conflict of interest and with respect to appointment of substitute members in such cases.

A.8 Initiation of Proceedings for Creation by Owner of Airport

21673

In any county not having a commission or a body designated to carry out the responsibilities of a commission, any owner of a public airport may initiate proceedings for the creation of a commission by presenting a request to the board of supervisors that a commission be created and showing the need therefore to the satisfaction of the board of supervisors.

A.9 Powers and Duties

21674

The commission has the following powers and duties, subject to the limitations upon its jurisdiction set forth in Section 21676:

(a) To assist local agencies in ensuring compatible land uses in the vicinity of all new airports and in the vicinity of existing airports to the extent that the land in the vicinity of those airports is not already devoted to incompatible uses.

(b) To coordinate planning at the state, regional, and local levels so as to provide for the orderly development of air transportation, while at the same time protecting the public health, safety, and welfare.

(c) To prepare and adopt an airport land use plan pursuant to Section 21675.

(d) To review the plans, regulations, and other actions of local agencies and airport operators pursuant to Section 21676.

(e) The powers of the commission shall in no way be construed to give the commission jurisdiction over the operation of any airport.

(f) In order to carry out its responsibilities, the commission may adopt rules and regulations consistent with this article.

A.10 Training of Airport Land Use Commission Staff

21674.5

(a) The Department of Transportation shall develop and implement a program or programs to assist in the training and development of the staff of airport land use commissions, after consulting with airport land use commissions, cities, counties, and other appropriate public entities.

(b) The training and development program or programs are intended to assist the staff of airport land use commissions in addressing high priority needs, and may include, but need not be limited to, the following:

(1) The establishment of a process for the development and adoption of comprehensive land use plans.

(2) The development of criteria for determining the airport influence area.

(3) The identification of essential elements which should be included in the comprehensive plans.

(4) Appropriate criteria and procedures for reviewing proposed developments and determining whether proposed developments are compatible with the airport use.

(5) Any other organizational, operational, procedural, or technical responsibilities and functions which the department determines to be appropriate to provide to commission staff and for which it determines there is a need for staff training or development.

(c) The department may provide training and development programs for airport land use commission staff pursuant to this section by any means it deems appropriate. Those programs may be presented in any of the following ways:

(1) By offering formal courses or training programs.

(2) By sponsoring or assisting in the organization and sponsorship of conferences, seminars, or other similar events.

(3) By producing and making available written information.

(4) Any other feasible method of providing information and assisting in the training and development of airport land use commission staff.

A.11 Airport Land Use Planning Handbook

21674.7

(a) An airport land use commission that formulates, adopts or amends a comprehensive airport land use plan shall be guided by information prepared and updated pursuant to Section 21674.5 and referred to as the Airport Land Use Planning Handbook published by the Division of Aeronautics of the Department of Transportation.

(b) It is the intent of the Legislature to discourage incompatible land uses near existing airports. Therefore, prior to granting permits for the renovation or remodeling of existing building, building, structure, or facility, and before the construction of a new building, it is the intent of the Legislature that local agencies shall be guided by the height, use, noise, safety, and density criteria that are compatible with airport operations, as established by this article, and referred to as the Airport Land Use Planning Handbook, published by the division, and any applicable federal aviation regulations, including, but not limited to, Part 77 (commencing with Section 77.1) of Title 14 of the Code of Federal Regulations, to the extent that the criteria has been incorporated into the plan prepared by a commission pursuant to Section 21675. This subdivision does not limit the jurisdiction of a commission as established by this article. This subdivision does not limit the authority of local agencies to overrule commission actions or recommendations pursuant to Sections 21676, 21676.5, or 21677.

A.12 Land Use Plan

21675

(a) Each commission shall formulate a comprehensive land use plan that will provide for the orderly growth of each public airport and the area surrounding the airport within the jurisdiction of the commission, and will safeguard the general welfare of the inhabitants within the vicinity of the airport and the public in general. The commission plan shall include and shall be based on a long-range master plan or an airport layout plan, as determined by the Division of Aeronautics of the Department of Transportation, that reflects the anticipated growth of the airport during at least the next 20 years. In formulating a land use plan, the commission may develop height restrictions on buildings, specify use of land, and determine building standards, including soundproofing adjacent to airports, within the planning area. The comprehensive land use plan shall be reviewed as often as necessary in order to accomplish its purposes, but shall not be amended more than once in any calendar year.

(b) The commission shall include, within its airport land use compatibility plan formulated pursuant to subdivision (a), the area within the jurisdiction of the commission surrounding any military airport for all of the purposes specified in subdivision (a). The airport land use compatibility plan shall be consistent with the safety and noise standards in the Air Installation Compatible Use Zone prepared for that military airport. This subdivision does not give the commission any jurisdiction or authority over the territory or operations of any military airport.

(c) The airport influence area shall be established by the commission after hearing and consultation with the involved agencies.

(d) The commission shall submit to the Division of Aeronautics of the department one copy of the land use compatibility plan and each amendment to the plan.

(e) If an airport land use compatibility plan does not include the matters required to be included pursuant to this article, the Division of Aeronautics of the department shall notify the commission responsible for the plan.

A.13 Adoption of Land Use Plan

21675.1

(a) By June 30, 1991, each commission shall adopt the airport land use compatibility plan required pursuant to Section 21675, except that any county that has undertaken by contract or otherwise completed land use compatibility plans for at least one-half of all public use airports in the county, shall adopt that plan on or before June 30, 1992.

(b) Until a commission adopts an airport land use compatibility plan, a city or county shall first submit all actions, regulations, and permits within the vicinity of a public airport to the commission for review and approval. Before the commission approves or disapproves any actions, regulations, or permits, the commission shall give public notice in the same manner as the city or county is required to give for those actions, regulations, or permits. As used in this section, "vicinity" means land which will be included or reasonably could be included within the airport land use compatibility plan. If the commission has not designated an airport influence area for the airport land use compatibility plan, then "vicinity" means land within two miles of the boundary of a public airport.

(c) The commission may approve an action, regulation, or permit if it finds, based on substantial evidence in the record, all of the following:

(1) The commission is making substantial progress toward the completion of the plan.

(2) There is a reasonable probability that the action, regulation, or permit will be consistent with the plan being prepared by the commission.

(3) There is little or no probability of substantial detriment to or interference with the future adopted plan if the action, regulation, or permit is ultimately inconsistent with the airport land use compatibility plan.

(d) If the commission disapproves an action, regulation, or permit, the commission shall notify the city or county. The city or county may overrule the commission, by a two-thirds vote of its governing body, if it makes specific findings that the proposed action, regulation, or permit is consistent with the purposes of this article, as stated in Section 21670.

(e) If a city or county overrules the commission pursuant to subdivision (d), that action shall not relieve the city or county from further compliance with this article after the commission adopts the airport land use compatibility plan.

(f) If a city or county overrules the commission pursuant to subdivision (d) with respect to a publicly owned airport that the city or county does not operate, the operator of the airport is not liable for damages to property or personal injury resulting from the city's or county's decision to proceed with the action, regulation, or permit.

(g) A commission may adopt rules and regulations which exempt any ministerial permit for single-family dwellings from the requirements of subdivision (b) if it makes the findings required pursuant to subdivision (c) for the proposed rules and regulations, except that the rules and regulations may not exempt either of the following:

(1) More than two single-family dwellings by the same applicant within a subdivision prior to June 30, 1991.

(2) Single-family dwellings in a subdivision where 25 percent or more of the parcels are undeveloped.

A.14 Approval or Disapproval of Actions, Regulations, or Permits

21675.2

(a) If a commission fails to act to approve or disapprove any actions, regulations, or permits within 60 days of receiving the request pursuant to Section 21675.1, the applicant or his or her representative may file an action pursuant to Section 1094.5 of the Code of Civil Procedure to compel the commission to act, and the court shall give the proceedings preference over all other actions or proceedings, except previously filed pending matters of the same character.

(b) The action, regulation, or permit shall be deemed approved only if the public notice required by this subdivision has occurred. If the applicant has provided seven days advance notice to the commission of the intent to provide public notice pursuant to this subdivision, then, not earlier than the date of the expiration of the time limit established by Section 21675.1, an applicant may provide the required public notice. If the applicant chooses to provide public notice, that notice shall include a description of the proposed action, regulation, or permit substantially similar to the descriptions which are commonly used in public notices by the commission, the location of any proposed development, the application number, the name and address of the commission, and a statement that the action, regulation, or permit shall be deemed approved if the commission has not acted within 60 days. If the applicant has provided the public notice specified in this subdivision, the time limit for action by the commission shall be extended to 60 days after the public notice is provided. If the applicant provides notice pursuant to this section, the commission shall refund to the applicant any fees which were collected for providing notice and which were not used for that purpose.

(c) Failure of an applicant to submit complete or adequate information pursuant to Sections 65943 to 65946, inclusive, of the Government Code, may constitute grounds for disapproval of actions, regulations, or permits.

(d) Nothing in this section diminishes the commission's legal responsibility to provide, where applicable, public notice and hearing before acting on an action, regulation, or permit.

A.15 Review of Local General Plans

21676

(a) Each local agency whose general plan includes areas covered by an airport land use compatibility plan shall, by July 1, 1983, submit a copy of its plan or specific plans to the airport land use commission. The commission shall determine by August 31, 1983, whether the plan or plans are consistent or inconsistent with the airport land use compatibility plan. If the plan or plans are inconsistent with the airports land use compatibility plan, the local agency shall be notified and that local agency shall have another hearing to reconsider its airport land use compatibility plans. The local agency may propose to overrule the commission after such hearing by a two-thirds vote of its governing body if it makes specific findings that the proposed action is consistent with the purposes of this article stated in Section 21670. At least 45 days prior to the decision to overrule the commission, the local agency governing body shall provide the commission and the division a copy of the proposed decisions and findings. The commission and the

division may provide comments to the local agency governing body within 30 days of receiving the proposed decision and findings. If the commission or the division's comments are not available within this time limit, the local agency governing body may act without them. The comments by the division or the commission are advisory to the local agency governing body. The local agency governing body shall include comments from the commission and the division in the final record of any final decision to overrule the commission, which may only be adopted by a two-thirds vote of the governing body.

(b) Prior to the amendment of a general plan or specific plan, or the adoption or approval of a zoning ordinance or building regulation within the planning boundary established by the airport land use commission pursuant to Section 21675, the local agency shall first refer the proposed action to the commission. If the commission determines that the proposed action is inconsistent with the commission's plan, the referring agency shall be notified. The local agency may, after a public hearing, overrule the commission by a two-thirds vote of its governing body if it makes specific findings that the proposed action is consistent with the purposes of this article stated in Section 21670. At least 45 days prior to the decision to overrule the commission, the local agency governing body shall provide the commission and the division a copy of the proposed decisions and findings. The commission and the division may provide comments to the local agency governing body within 30 days of receiving the proposed decision and findings. If the commission or the division's comments are not available within this time limit, the local agency governing body may act without them. The comments by the division or the commission are advisory to the local agency governing body. The local agency governing body shall include comments from the commission and the division in the final record of any final decision to overrule the commission, which may only be adopted by a two-thirds vote of the governing body.

(c) Each public agency owning any airport within the boundaries of an airport land use compatibility plan shall, prior to modification of its airport master plan, refer such proposed change to the airport land use commission. If the commission determines that the proposed action is inconsistent with the commission's plan, the referring agency shall be notified. The public agency may, after a public hearing, overrule the commission by a two-thirds vote of its governing body if it makes specific findings that the proposed action is consistent with the purposes of this article stated in Section 21670. At least 45 days prior to the decision to overrule the commission, the local agency governing body shall provide the commission and the division a copy of the proposed decisions and findings. The commission and the division may provide comments to the local agency governing body within 30 days of receiving the proposed decision and findings. If the commission or the division's comments are not available within this time limit, the local agency governing body may act without them. The comments by the division or the commission are advisory to the local agency governing body. The local agency governing body shall include comments from the commission and the division in the final record of any final decision to overrule the commission, which may only be adopted by a two-thirds vote of the governing body.

(d) Each commission determination pursuant to subdivision (b) or (c) shall be made within 60 days from the date of referral of the proposed action. If a commission fails to make the determination within that period, the proposed action shall be deemed consistent with the airport land use compatibility plan.

A.16 Review of Local Plans

21676.5

(a) If the commission finds that a local agency has not revised its general plan or specific plan or overruled the commission by a two-thirds vote of its governing body after making specific findings that the proposed action is consistent with the purposes of this article as stated in Section 21670, the commission may require that the local agency submit all subsequent actions, regulations, and permits to the commission for review until its general plan or specific plan is revised or the specific findings are made. If, in the determination of the commission, an action, regulation, or permit of the local agency is inconsistent with the airport land use compatibility plan, the local agency shall be notified and that local agency shall hold a hearing to reconsider its plan. The local agency may propose to overrule the commission after the hearing by a two-thirds vote of its governing body if it makes specific findings that the proposed action is consistent with the purposes of this article as stated in Section 21670. At least 45 days prior to the decision to overrule the commission, the local agency governing body shall provide the commission and the division a copy of the proposed decisions and findings. The commission and the division may provide comments to the local agency governing body within 30 days of receiving the proposed decision and findings. If the commission or the division's comments are not available within this time limit, the local agency governing body may act without them. The comments by the division or the commission are advisory to the local agency governing body. The local agency governing body shall include comments from the commission and the division in the final record of any final decision to overrule the commission, which may only be adopted by a two-thirds vote of the governing body.

(b) Whenever the local agency has revised its general plan or specific plan or has overruled the commission pursuant to subdivision (a), the proposed action of the local agency shall not be subject to further commission review, unless the commission and the local agency agree that individual projects shall be reviewed by the commission.

A.17 Marin County Override Provisions

21677

Notwithstanding Section 21676, any public agency in the County of Marin may overrule the Marin County Airport Land Use Commission by a majority vote of its governing body. At least 45 days prior to the decision to overrule the commission, the local agency governing body shall provide the commission and the division a copy of the proposed decisions and findings. The commission and the division may provide comments to the local agency governing body within 30 days of receiving the proposed decision and findings. If the commission or the division's comments are not available within this time limit, the local agency governing body may act without them. The comments by the division or the commission are advisory to the local agency governing body. The local agency governing body shall include comments from the commission and the division in the final record of any final decision to overrule the commission, which may only be adopted by a two-thirds vote of the governing body.

A.18 Airport Owner's Immunity

21678

With respect to a publicly owned airport that a public agency does not operate, if the public agency pursuant to Section 21676 or 21676.5 overrides a commission's action or recommendation, the operator of the airport shall be immune from liability for damages to property or personal injury caused by or resulting directly or indirectly from the public agency's decision to override the commission's action or recommendation.

A.19 Court Review

21679

(a) In any county in which there is no airport land use commission or other body designated to assume the responsibilities of an airport land use commission, or in which the commission or other designated body has not adopted an airport land use compatibility plan, an interested party may initiate proceedings in a court of competent jurisdiction to postpone the effective date of a zoning change, a zoning variance, the issuance of a permit, or the adoption of a regulation by a local agency, which directly affects the use of land within one mile of the boundary of a public airport within the county.

(b) The court may issue an injunction which postpones the effective date of the zoning change, zoning variance, permit, or regulation until the governing body of the local agency which took the action does one of the following:

(1) In the case of an action which is a legislative act, adopts a resolution declaring that the proposed action is consistent with the purposes of this article stated in Section 21670.

(2) In the case of an action which is not a legislative act, adopts a resolution making findings based on substantial evidence in the record that the proposed action is consistent with the purposes of this article stated in Section 21670.

(3) Rescinds the action.

(4) Amends its action to make it consistent with the purposes of this article stated in Section 21670, and complies with either paragraph (1) or (2) of this subdivision, whichever is applicable.

(c) The court shall not issue an injunction pursuant to subdivision (b) if the local agency which took the action demonstrates that the general plan and any applicable specific plan of the agency accomplishes the purposes of an airport land use compatibility plan as provided in Section 21675.

(d) An action brought pursuant to subdivision (a) shall be commenced within 30 days of the decision or within the appropriate time periods set by Section 21167 of the Public Resources Code, whichever is longer.

(e) If the governing body of the local agency adopts a resolution pursuant to subdivision (b) with respect to a publicly owned airport that the local agency does not operate, the operator of the airport shall be immune from liability for damages to property or personal injury from the local agency's decision to proceed with the zoning change, zoning variance, permit, or regulation.

(f) As used in this section, "interested party" means any owner of land within two miles of the boundary of the airport or any organization with a demonstrated interest in airport safety and efficiency.

A.20 Deferral of Court Review

21679.5

(a) Until June 30, 1991, no action pursuant to Section 21679 to postpone the effective date of a zoning change, a zoning variance, the issuance of a permit, or the adoption of a regulation by a local agency, directly affecting the use of land within one mile of the boundary of a public airport, shall be commenced in any county in which the commission or other designated body has not adopted an airport land use compatibility plan, but is making substantial progress toward the completion of the airport land use compatibility plan.

(b) If a commission has been prevented from adopting the airport land use compatibility plan by June 30, 1991, or if the adopted airport land use compatibility plan could not become effective, because of a lawsuit involving the adoption of the airport land use compatibility plan, the June 30, 1991, date in subdivision (a) shall be extended by the period of time during which the lawsuit was pending in a court of competent jurisdiction.

(c) Any action pursuant to Section 21679 commenced prior to January 1, 1990, in a county in which the commission or other designated body has not adopted an airport land use compatibility plan, but is making substantial progress toward the completion of the airport land use compatibility plan, which has not proceeded to final judgment, shall be held in abeyance until June 30, 1991. If the commission or other designated body adopts an airport land use compatibility plan on or before June 30, 1991, the action shall be dismissed. If the commission or other designated body does not adopt an airport land use compatibility plan on or before June 30, 1991, the plaintiff or plaintiffs may proceed with the action.

(d) An action to postpone the effective date of a zoning change, a zoning variance, the issuance of a permit, or the adoption of a regulation by a local agency, directly affecting the use of land within one mile of the boundary of a public airport for which an airport land use compatibility plan has not been adopted by June 30, 1991, shall be commenced within 30 days of June 30, 1991, or within 30 days of the decision by the local agency, or within the appropriate time periods set by Section 21167 of the Public Resources Code, whichever date is later.

Appendix B
Airport Land Use Compatibility Concepts

ESA

APPENDIX B
Airport Land Use Compatibility Concepts

Introduction

The information provided in this appendix addresses concepts and rationale used during the development of the compatibility policies and figures presented in Chapters 2 and 3 of this CLUP. The foundation for these policies and the concepts behind them derive from the *California Airport Land Use Compatibility Handbook* (Caltrans, January 2002).

As outlined in the *Handbook* and this CLUP, the policies regarding airport land use compatibility are focused into four concepts categories:

1. **Noise** – As defined by cumulative noise exposure contours depicting noise from aircraft operations near an airport.

2. **Safety** – This addresses minimizing risks of aircraft accidents beyond the runway environment, and their potential impacts to the general public in the airport's vicinity.

3. **Airspace Protection** – This is accomplished by placing limits on the height of man-made structures and other objects in the airport vicinity, and restrictions on other uses that potentially pose hazards to flight.

4. **Overflight** – The impacts of aircraft flight over a community.

Noise

Noise is one of the most basic airport land use compatibility concerns. Moreover, at major airline airports, many busy general aviation airports, and most military airfields, noise is often the most recognized impact by the general public.

Compatibility Objective

The purpose of noise compatibility policies s to reduce the number of people exposed to frequent and/ or high levels of airport noise. This is often accomplished by avoiding the establishment of new, noise-sensitive land uses in areas that are exposed to significant levels of aircraft noise.

Measurement

For the purpose of airport land use compatibility planning, noise generated by the operation of aircraft to, from, and around an airport is primarily measured in terms of the cumulative noise levels of all aircraft operations. In California, the cumulative noise level metric established by state regulations, including for airport noise, is the Community Noise Equivalent Level (CNEL). This metric provides a single measure of the average sound level in decibels (dB) to which any point near an airport is exposed.

To reflect assumed greater community sensitivity to nighttime and evening noise, events during these periods are counted as being louder than actually measured due to the fact fewer ambient noises exist as during the daytime. Cumulative noise levels are usually illustrated on airport area maps as contour lines connecting points of equal noise exposure. Mapped noise contours primarily show areas of significant noise exposures – ones affected by high concentrations of aircraft takeoffs and landings.

Calculating cumulative noise levels requires several inputs, including the number, type, and time of day of aircraft operations, the location of flight tracks as well as other data. Airports with air traffic control towers can often provide recorded data, and in most metropolitan areas, noise monitoring and radar flight tracking data is available. An important point to be stressed is that, despite the availability of a multitude of data, the location of noise contours is not necessarily precise. In the best of situations, where extensive noise monitoring and flight track data is available, current contours can be accurate to within ±1 dB. In locations where less data is available, the level of accuracy has generally been found to be ±3 dB.

Compatibility Strategies

The basic strategy for achieving noise compatibility in the vicinity of an airport is to limit development of land uses which are particularly sensitive to noise. Given the effect that varying levels of noise can have on people (see Table B-1), the most acceptable land uses are ones which either involve few people, or generate significant noise levels themselves (such as other transportation facilities or some industrial uses).

On occasion, local considerations outweigh noise impacts and result in decisions by local land use jurisdictions or even ALUCs to allow residential development in locations where this type of use would normally be considered incompatible. In these situations, approval of development should be conditioned upon the dedication of avigation easement and requirements for sufficient acoustic insulation of structures to assure that aircraft noise is reduced to an interior noise level of 45 dB CNEL or less.

TABLE B-1
SUMMARY OF EFFECTS OF NOISE ON PEOPLE

Day-Night Average Sound Level (Decibels)	Effects[1]			
	Hearing Loss (Qualitative Description)	Annoyance[2] (Percentage of Population Highly Annoyed)[3]	Average Community Reaction[4]	General Community Attitude Toward Area
≥75	May begin to occur	37%	Very severe	Noise is likely to be the most important of all adverse aspects of the community environment.
70	Will not likely occur	22%	Severe	Noise is one of the most important adverse aspects of the community environment.
65	Will not occur	12%	Significant	Noise is one of the important adverse aspects of the community environment.
60	Will not occur	7%	Moderate to Slight	Noise may be considered an adverse aspect of the community environment.
≤55	Will not occur	3%		Noise considered no more important than various other environmental factors.

[1] All data is drawn from National Academy of Science 1977 report *Guidelines for Preparing Environmental Impact Statements on Noise*, Report of Working Group 69 on Evaluation of Environmental Impact of Noise.

[2] A summary measure of the general adverse reaction of people to living in noisy environments that cause speech interference; sleep disturbance; desire for tranquil environment; and the inability to use the telephone, radio or television satisfactorily.

[3] The percentage of people reporting annoyance to lesser extents are higher in each case. An unknown small percentage of people will report being "highly annoyed" even in the quietest surroundings. One reason is the difficulty all people have in integrating annoyance over a very long time. USAF Update with 400 points (Finegold et al. 1992)

[4] Attitudes or other non-acoustic factors can modify this. Noise at low levels can still be an important problem, particularly when it intrudes into a quiet environment.

NOTE:
Research implicates noise as a factor producing stress-related health effects such as heart disease, high blood pressure and stroke, ulcers and other digestive disorders. The relationships between noise and these effects, however, have not as yet been conclusively demonstrated. (Thompson 1981; Thompson et al. 1989; CHABA 1981; CHABA 1982; Hattis et al. 1980; and U.S. EPA 1981)

Source: Federal Interagency Committee on Noise (1992)

Source: Caltrans, *California Airport Land Use Planning Handbook*, January 2002.

Basis for Setting Criteria

Compatibility criteria related to cumulative noise levels are well-established in federal and state laws and regulations. The basic state criterion sets a CNEL of 65 dB as the maximum noise level normally compatible with urban residential land uses, though local jurisdictions can institute a lower maximum CNEL for residential land uses. A process called "normalization" is one means of adjusting the criteria to reflect ambient sound levels, the community's previous exposure to noise, and any other local characteristics. This process helps to determine what CNEL is of significance to that particular community. Once the baseline maximum CNEL for residential uses is established, criteria for other land uses can be set in a manner consistent with this starting point.

Safety

In comparison to noise, safety is in many respects a more difficult concern to address in airport land use compatibility policies. The primary reason for this difference is that safety policies address uncertain events which *may occur* with *occasional* aircraft operations, whereas noise policies deal with known, quantifiable, and more or less predictable events which *do occur* with *every* aircraft operation. Because aircraft accidents happen infrequently and the time, place, and consequences of their occurrence cannot be predicted, the concept of "risk" is central to the assessment of safety compatibility. From the standpoint of land use planning, two variables determine the degree of risk posed by potential aircraft accidents:

1. *Accident Frequency* – Where and when aircraft accidents occur in the vicinity of the airport; and

2. *Accident Consequences* – Land uses and land use characteristics which affect the severity of an accident when one occurs.

Compatibility Objective

The main objective of safety compatibility criteria is to simply minimize the risks associated with potential aircraft accidents. This task is made up of two components; 1) safety on the ground; and 2) safety for aircraft occupants. The fundamental objective for providing safety on the ground is to protect people and property in the event of an aircraft accident near an airport. Safety for aircraft occupants involves trying to find ways in which to enhance the chances of survival of occupants of an aircraft involved in an accident beyond the runway environment.

Measurement

Measuring the degree of safety concerns around an airport involves a determination of frequency, or in other words, assessing the potential for an accident to occur. This task includes determining two elements: *where* aircraft accidents are expected to occur, and *when* an accident might happen.

Of these two elements, the *where*, or "spatial" element is most meaningful to land use compatibility planning for a given airport. Looking at nationwide accident data, it is possible to perceive the possible location of aircraft accidents based upon the frequency of occurrence. In contrast, the *when*, or "time" element, is not very useful for land use compatibility planning due to the fact that there are too many unknowns in determining when an aircraft accident might occur.

While the historical number of aircraft accidents nationwide has varied over the years, future trends can nevertheless be predicted with a fair degree of accuracy. Even with respect to specific classes of aviation (air carrier, general aviation, and military) or types of aircraft (business jets, helicopters, etc.), the frequency of accident occurrence is fairly constant and predictable. The difficulty with prediction arises when the focus is on a single airport rather than nationwide data. The *Handbook* presents a set of diagrams indicating where accidents are most likely to occur around general aviation airports. Figure B-2 and 3 show the spatial distribution of general aviation aircraft accidents. (These charts show accident data for *all* general aviation airports. Data on accidents associated with varying runway lengths can be found in the *Handbook*, and was used for the purpose of developing safety criteria for this CLUP.)

From these two charts, several important facts are revealed:

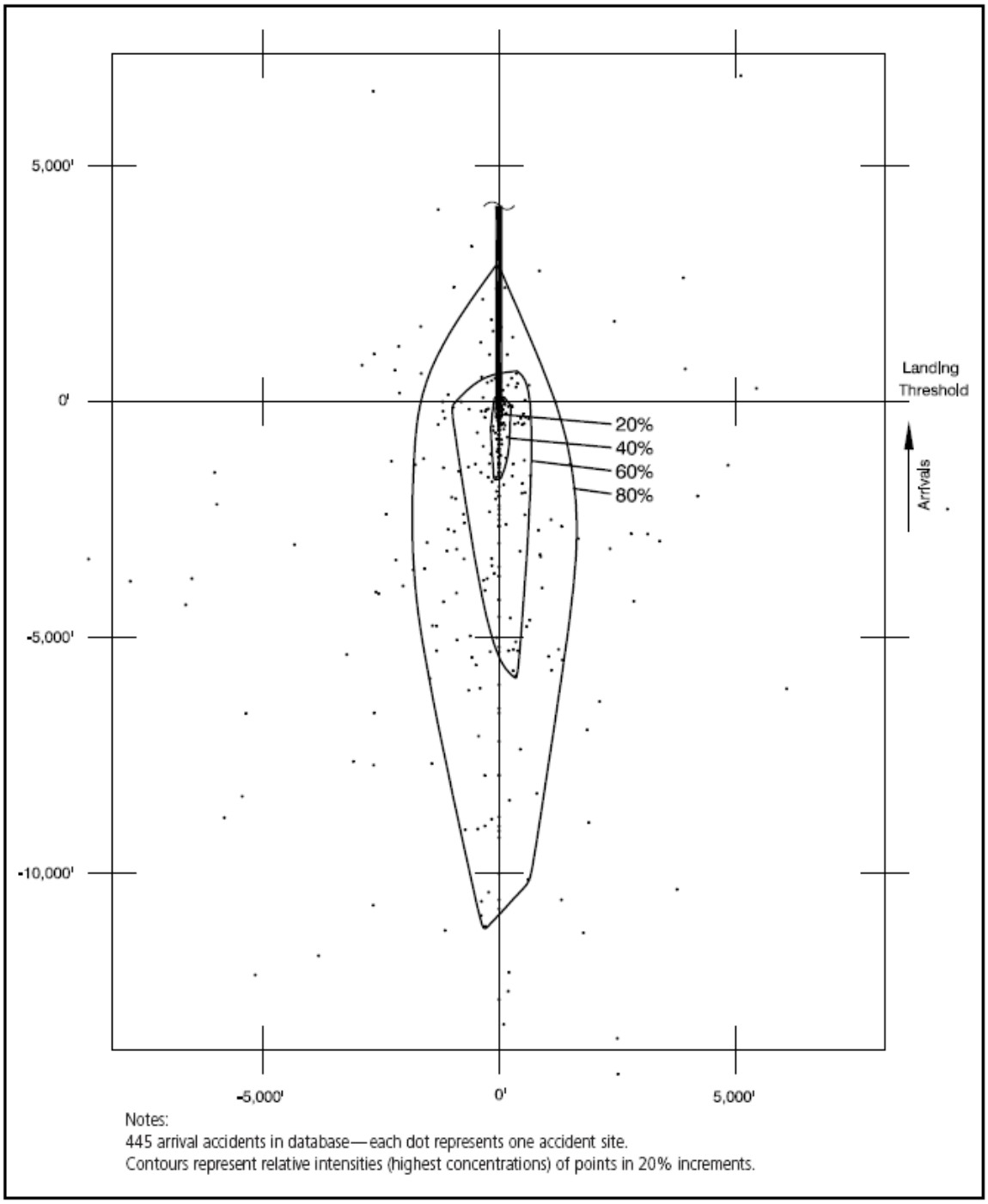
Arrival Accident Patterns

- Arrival accident sites tend to be located close to the extended runway centerline.
- Some 40% fall within a narrow strip, approximately 500-feet-wide and extending some 2,000 feet from the runway end.
- Over 80% of the arrival accident sites are concentrated within just 2,000 feet laterally from the extended runway centerline, but extending outward to approximately 11,000 feet (about 2.0 miles) of the runway end.

Departure Accident Patterns

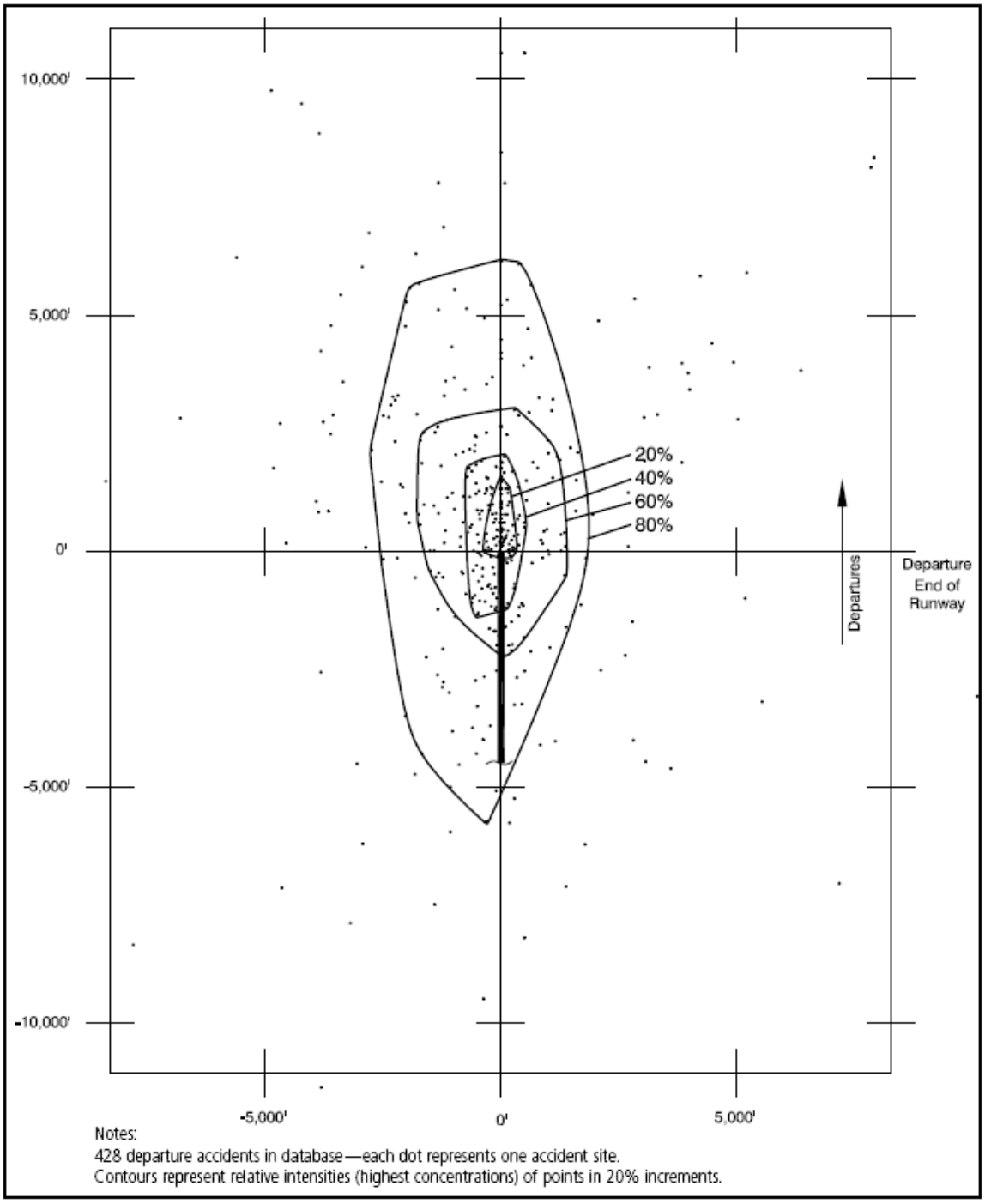
- Departure accident sites also tend to be clustered near the runway end, but are not as concentrated close to the runway centerline as are the arrival accident sites.
- The most tightly bunched 40% of the points lie within an area 1,500 feet wide, extending approximately 2,000 feet beyond the runway end, but also adjacent to the edges of the runway.
- The 80% contour extends some 6,000 feet beyond the runway end plus along the sides of the runway and spreads laterally approximately 2,000 feet from the runway centerline.

FIGURE B-2
GENERAL AVIATION ACCIDENT DISTRIBUTION CONTOURS (ALL ARRIVALS)



Source: Caltrans, *California Airport Land Use Planning Handbook*, January 2002.

FIGURE B-3
GENERAL AVIATION ACCIDENT DISTRIBUTION CONTOURS (ALL DEPARTURES)



Source: Caltrans, *California Airport Land Use Planning Handbook*, January 2002.

- Two factors account for the substantial number of departure accident sites lateral to the runway.

    1. As defined for the purposes of the database, departing aircraft which crash while attempting to return to the runway are counted as departure accidents unless the aircraft became established in the traffic pattern or on final approach; and

    2. On long runways, aircraft may begin to turn before reaching the far end of the runway.

The next step in taking the accident data provided above and making it applicable to a specific airport is the creation of safety zones. Within safety zones, it is possible for ALUCs to define safety compatibility policies. Safety zones are created to match runways of varying lengths and the approach patterns of a specific airport. The shapes of these zones reflect not just the accident distribution data, but also the ways in which different aircraft operations create various accident risk characteristics close to an airport. For most airports, the *Handbook* suggests creating six safety zones. The locations and typical dimensions of safety zones for both general aviation airports and air carrier airports are depicted in Figures B-4 and 5. In general, the level of risk associated with each safety zone is as follows:

- Zone 1 (Runway Protection Zone) – The risk is greatest in this zone. The dimensions of the RPZ are defined by FAA, which encourages airport ownership of this area and designates specific land use standards when it *is* owned by the airport. Where the land is not owned by the airport, FAA standards serve as recommendations.

- Zone 2 (Inner Approach/Departure Zones) – This zone extends beyond Zone 1, and has a significant degree of risk.

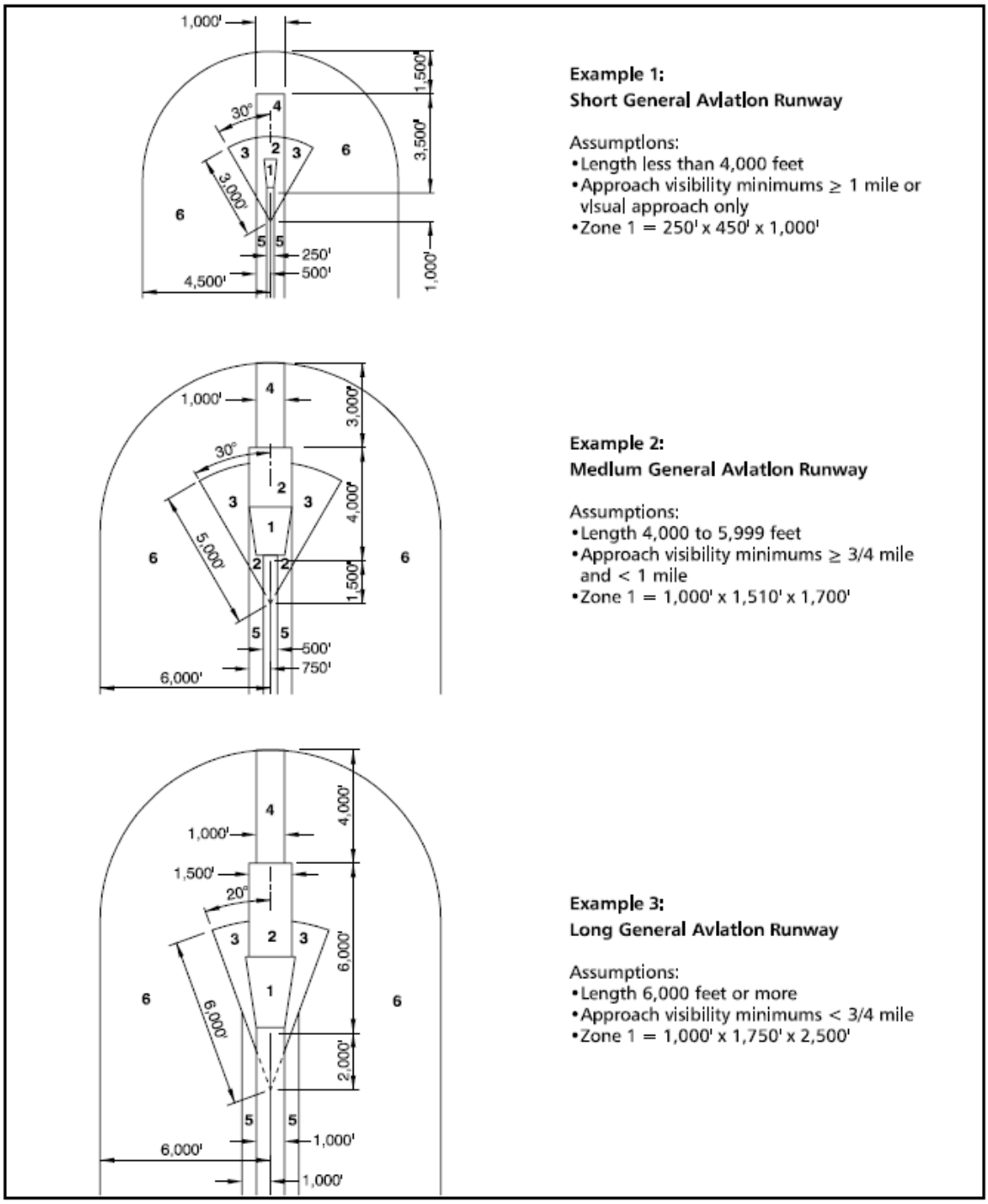
- Zone 3 (Inner Turning Zones) – The risk in this zone is less than in Zones 1 and 2, but greater than 4, 5, and 6. This area encompasses locations where aircraft typically turn at low altitudes while approaching or departing the runway.

- Zone 4 (Outer Approach/Departure Zones) – This zone extends along the runway centerline beyond Zone 2. The degree of significance of this zone depends on whether or not an airport has a straight-in instrument approach procedure.

- Zone 5 (Sideline Zone) – This zone lies adjacent to the runway, and is usually located on airport property. The risk associated with this area is similar to Zone 4.

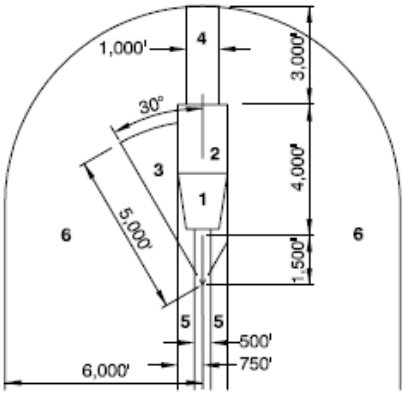
- Zone 6 (Traffic Pattern Zone) – This zone contains the aircraft traffic pattern. While a high percentage of accidents occur in this zone, the size of the zone reduces the risk level as compared to the other zones.

FIGURE B-4
SAFETY COMPATIBILITY ZONES FOR GENERAL AVIATION RUNWAYS



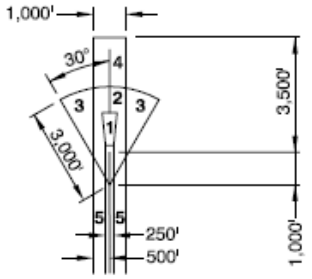
Source: Caltrans, *California Airport Land Use Planning Handbook*, January 2002.

FIGURE B-4 (CONT.)
SAFETY COMPATIBILITY ZONE EXAMPLES FOR GENERAL AVIATION RUNWAYS



Example 4:
General Aviation Runway with Single-Sided Traffic Pattern

Assumptions:
- No traffic pattern on right
- Length 4,000 to 5,999 feet
- Approach visibility minimums ≥ 3/4 mile and < 1 mile
- Zone 1 = 1,000' x 1,510' x 1,700'



Example 5:
Low-Activity General Aviation Runway

Assumptions:
- Less than 2,000 takeoffs and landings per year at individual runway end.
- Length less than 4,000 feet
- Approach visibility minimums ≥ 1 mile or visual approach only
- Zone 1 = 250' x 450' x 1,000'

Legend

1. Runway Protection Zone
2. Inner Approach/Departure Zone
3. Inner Turning Zone
4. Outer Approach/Departure Zone
5. Sideline Zone
6. Traffic Pattern Zone

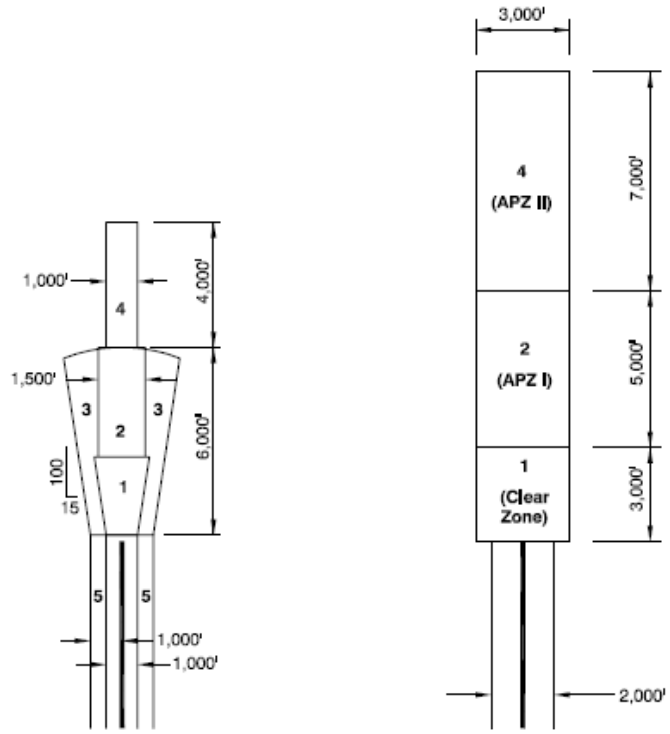
Notes:

- RPZ (Zone 1) size in each example is as indicated by FAA criteria for the approach type assumed. Adjustment may be necessary if the approach type differs.
- See Table 9A for factors to consider regarding other possible adjustments to these zones to reflect characteristics of a specific airport runway.
- See Tables 9B and 9C for guidance on compatibility criteria applicable with each zone.

These examples are intended to provide general guidance for establishment of airport safety compatibility zones. They do not represent California Department of Transportation standards or policy.

Source: Caltrans, *California Airport Land Use Planning Handbook*, January 2002.

FIGURE B-5
LARGE AIR CARRIER AND MILITARY RUNWAYS



Large Air Carrier Runway

Assumptions:
- Minimal light-aircraft general aviation activity
- Predominately straight-in and straight-out flight routes
- Approach visibility minimums < 3/4 mile
- Zone 1 = 1,000' x 1,750' x 2,500'

Military Runway for Large Aircraft

Assumptions:
- Military airport
- Predominately straight-in and straight-out flight routes (must modify for turning routes and traffic pattern activity)

Legend

1. Runway Protection Zone (Clear Zone)
2. Inner Approach/Departure Zone (Accident Potential Zone I)
3. Inner Turning Zone
4. Outer Approach/Departure Zone (Accident Potential Zone II)
5. Sideline Zone

Notes:

- RPZ (Zone 1) size in the large air carrier runway example is as indicated by FAA criteria for the approach type assumed. Adjustment may be necessary if the approach type differs.
- See Table 9A for factors to consider regarding other possible adjustments to these zones to reflect characteristics of a specific airport runway.
- See Tables 9B and 9C for guidance on compatibility criteria applicable with each zone.

These examples are intended to provide general guidance for establishment of airport safety compatibility zones. They do not represent California Department of Transportation standards or policy.

Source: Caltrans, *California Airport Land Use Planning Handbook*, January 2002.

Compatibility Strategies

Safety compatibility strategies focus on the *consequences* component of risk assessment. Essentially, the question that any ALUC or local jurisdiction should ask when making land use decisions in an airport AIA is: what land use planning measure can be taken to reduce the severity of an aircraft accident if one occurs in a particular location near an airport? Although there is a significant overlap, specific strategies must consider both components of the safety compatibility objective: protecting people and property on the ground; and enhancing safety for aircraft occupants. In each case, the primary strategy is to limit the intensity of use (the number of people concentrated on the site) in locations most susceptible to an off-airport aircraft accident. This is accomplished in several ways:

- *Density and Intensity Limitations*: Establishment of criteria limiting the maximum number of dwellings or people in areas close to the airport is the most direct method of reducing the potential severity of an aircraft accident.

- *Open Land Requirements*: Creation of requirements for open land near an airport addresses the objective of enhancing safety for the occupants of an aircraft forced to make an emergency landing away from a runway.

- *Highly Risk-Sensitive Uses*: Certain critical types of land uses – particularly schools, hospitals, and other uses in which the mobility of occupants is effectively limited – should be avoided in the vicinity of an airport regardless of the number of people involved.

Basis of Setting Criteria

Setting safety compatibility criteria presents the fundamental question of what is safe, or rather, what is an *acceptable* risk? In one respect, it may seem ideal to reduce risks to a minimum by prohibiting most types of land use development from areas near airports. However, there are usually costs associated with such high degree of restrictiveness. In practice, safety criteria are set on a progressive scale with the greatest restrictions established in locations with the greatest potential for aircraft accidents. The following resources can and should be utilized in order to develop safety criteria:

- *Established Guidance*: Little established guidance is available to ALUCs regarding how restrictive to make safety criteria for various parts of an airport's environs. Unlike noise, there are no formal federal or state laws or regulations which set safety criteria for airport area land uses for civilian airport except within runway protection zones (and with regard to airspace obstructions as described separately under *airspace protection*). FAA safety criteria primarily are focused on the runway and its immediate environment. Runway protection zones (also known as "clear areas"), were originally established mostly for the purpose of protecting the occupants of aircraft which overrun or land short of a runway.

Now, they are defined by FAA as intended to enhance the protection of people and property on the ground.

- *New Research*: To provide a better foundation for establishment of safety criteria in other portions of the airport environs, extensive research into the distribution of general aviation accident locations was conducted in conjunction with the 1993 edition of the *Handbook* and expanded as an initial step in preparation of the present edition. For this reason, the *Handbook* serves as the primary guide for the development of safety compatibility criteria. Although this document is not regulatory by nature, state law requires ALUCs to "be guided by" the information provided in the *Handbook*.

Airspace Protection

Relatively few aircraft accidents are caused by land use conditions which are hazards to flight. The potential exists, however, and protecting against it is essential to airport land use safety compatibility.

Compatibility Objective

Because airspace protection is in effect a safety factor, its object can likewise be thought of in terms of risk. Specifically, the objective is to avoid development of land use conditions which, by posing hazards to flight, can increase the risk of an accident occurring. The particular hazards of concern are:

- Airspace obstructions;
- Wildlife hazards, particularly bird strikes; and
- Land use characteristics which pose other potential hazards to flight by creating visual, unseen, or electronic interference with air navigation.

Measurement

The measurement of requirements for airspace protection around an airport is a function of several variables including: the dimensions and layout of the runway system; the type of operating procedures established for the airport; and, indirectly, the performance capabilities of aircraft operated at the airport.

- *Airspace Obstructions*: Whether a particular object constitutes an airspace obstruction depends upon the height of the object relative to the runway elevation and its proximity to the airport. The acceptable height of objects near an airport is most commonly determined by application of standards set forth in Federal Aviation Regulation Part 77: *Objects Affecting Navigable Airspace*. These regulations establish a three-dimensional

space in the air above an airport. Any object which penetrates this volume of airspace is considered to be an obstruction and may affect the aeronautical use of the airspace.

- *Wildlife and Other Hazards to Flight*: The significance of other potential hazards to flight is principally measured in terms of a hazard's specific characteristics and its distance from the airport and/ or its normal traffic patterns.

Compatibility Strategies

Compatibility strategies for the protection of airport airspace are relatively simple and are directly associated with these types of hazards:

- *Airspace Obstructions*: Buildings, antennas, other types of structures, and trees should be limited in height so as not to pose a potential hazard to flight.

- *Wildlife and Other Hazards to Flight*: Land uses which may create other types of hazards to flight near an airport should be avoided or modified so as not to include the offending characteristic. This could include, but would not be limited to land uses which create habitat for wildlife potentially hazardous to aircraft operations, industrial uses which create smoke, steam, or thermal plumes, and utility uses like electrical substations which could cause electrical interference.

Basis for Setting Criteria

The criteria for determining airspace obstructions and other hazards to flight have been long-established in FAR Part 77 and other FAA regulations and guidelines. Also, State of California regulation of obstructions under the State Aeronautics Act (Public Utilities Code, Section 21659) is based on FAR Part 77 criteria. (For further information regarding FAR Part 77, please see Appendix C.)

Overflight

Experience at many airports has shown that noise-related concerns do not stop at the boundary of the outermost mapped CNEL contour. Many people are sensitive to the frequent presence of aircraft overhead even at low noise levels. These reactions can be most accurately described in the form of annoyance.

At many airports, particularly air carrier airports, complaints often come from locations beyond any of the defined noise contours. Indeed, heavily used flight corridors to and from metropolitan areas are known to generate noise complaints 50 miles or more from the associated airport. The basis for such complaints may be a desire and expectation that outside noise sources not be intrusive – or, in some circumstances, even distinctly audible – above the quiet, natural background noise level. Elsewhere, especially in locations beneath the traffic patterns of general

aviation airports, a fear factor also contributes to some individuals' sensitivity to aircraft overflights.

While these impacts may be important community concerns, the question of importance here is whether any land use planning actions can be taken to avoid or mitigate the impacts or otherwise address the concerns. Commonly, when overflight impacts are under discussion in a community, the focus is on modification of the flight routes. Indeed, some might argue that overflight impacts should be addressed solely through the aviation side of the equation – not only flight route changes, but other modifications to where, when, and how aircraft are operated.

ALUCs are particularly limited in their ability to deal with overflight concerns. For one, they have no authority over aircraft operations. The most they can do to bring about changes is to make requests or recommendations. Even with regard to land use, the authority of ALUCs extends only to proposed new development.

Compatibility Objective

In an idealistic sense, the compatibility objective with respect to overflight is the same as for noise: avoid land use development which can lead to annoyance and complaints. However, given the extensive geographic area over which the impacts may occur, this objective is unrealistic except when relatively close to the airport. A more realistic objective therefore is to promote conditions under which annoyance will be minimized.

Measurement

Determining where to draw boundaries around areas of potentially significant overflight noise exposure is difficult because these locations extend beyond the well-defined CNEL contours which indicate areas of high noise exposure. CNEL contours are not very precise as low noise levels, especially where aircraft flight tracks are widely divergent. The general locations over which aircraft regularly fly as they approach and depart an airport is thus a better indicator of overflight annoyance concerns. For general aviation airports, such locations include areas beneath the standard airport traffic patterns, the portions of the pattern entry and departure routes flown at normal traffic pattern altitude, and perhaps additional places which experience a high concentration of overflights. Also, at all types of airports, common IFR arrival and departure routes can produce overflight concerns, sometimes many miles from the airport.

Compatibility Strategies

As noted above, the ideal land use compatibility strategy with respect to overflight annoyance is to avoid development of residential and other noise-sensitive uses in the affected locations. To the extent that this approach is not practical, three different (but not mutually exclusive) strategies are apparent.

One strategy is to help people with above-average sensitivity to aircraft overflights – people who are highly annoyed by overflights – to avoid living in locations where frequent overflights occur. This strategy involves making people more aware of an airport's proximity and its current and potential aircraft noise impacts on the community before the move to the area. This can be accomplished through buyer awareness measures such as dedication of avigation or overflight easements, recorded deed notices, and/ or real estate disclosure statements. In new residential developments, posting of signs in the real estate sales office and/ or at key locations in the subdivision itself can serve as additional means of alerting the initial purchasers about the impacts.

A second strategy is to minimize annoyance by reducing the intrusiveness of aircraft noise above normal background noise levels. Because ALUCs and local jurisdictions have no way of regulating aircraft noise levels, the other option is to promote types of residential land uses which tend to mask the intrusive noise. Particularly undesirable are "ranchette" style residential areas consisting of large (about an acre on average) lots. Such developments are dense enough to expose many people to overflight noise, yet sufficiently rural in character that background noise levels are likely to be low.

Finally, for highly noise-sensitive uses, acoustical treatment of the structures, together with dedication of an avigation easement, may be appropriate.

Basis for Setting Criteria

In California, the most definitive guidance on the location of overflight impacts or the appropriate associated action taken in response to an impact comes from a state law which went into effect January 2004. California statutes (Business and Professional Code Section 11010 and Civil Code Sections 1103 and 1353) now require most residential real estate transactions, including all involving subdivisions, to include disclosure of the property's proximity to a nearby airport. The area encompassed by the disclosure requirement is two miles from the airport, or the AIA as established by the ALUC.

Appendix C
Federal Aviation Regulations, Part 77

ESA

APPENDIX C
Federal Aviation Regulations, Part 77

Part 77 — Objects Affecting Navigable Airspace

Subpart E Rules of Practice for Hearings under Subpart D

Subpart F Establishment of Antenna Farm Areas

Authority: 49 U.S.C. 106(g), 40103, 40113-40114, 44502, 44701, 44718, 46101-46102, 46104.
Source: Docket No. 1882, 30 FR 1839, Feb. 10, 1965, unless otherwise noted.

Subpart A — General

Sec. 77.1 Scope.

This part:

(a) Establishes standards for determining obstructions in navigable airspace;

(b) Sets forth the requirements for notice to the Administrator of certain proposed construction or alteration;

(c) Provides for aeronautical studies of obstructions to air navigation, to determine their effect on the safe and efficient use of airspace;

(d) Provides for public hearings on the hazardous effect of proposed construction or alteration on air navigation; and

(e) Provides for establishing antenna farm areas.

Sec. 77.2 Definition of Terms.

For the purpose of this part:

"Airport available for public use" means an airport that is open to the general public with or without a prior request to use the airport.

"A seaplane base" is considered to be an airport only if its sea lanes are outlined by visual markers.

"Nonprecision instrument runway" means a runway having an existing instrument approach procedure utilizing air navigation facilities with only horizontal guidance, or area type navigation equipment, for which a straight- in nonprecision instrument approach procedure has been approved, or planned, and for which no precision approach facilities are planned, or indicated on an FAA planning document or military service military airport planning document.

"Precision instrument runway" means a runway having an existing instrument approach procedure utilizing an Instrument Landing System (ILS), or a Precision Approach Radar (PAR). It also means a runway for which a precision approach system is planned and is so indicated by an FAA approved airport layout plan; a military service approved military airport layout plan; any other FAA planning document, or military service military airport planning document.

"Utility runway" means a runway that is constructed for and intended to be used by propeller driven aircraft of 12,500 pounds maximum gross weight and less.

"Visual runway" means a runway intended solely for the operation of aircraft using visual approach procedures, with no straight-in instrument approach procedure and no instrument designation indicated on an FAA approved airport layout plan, a military service approved military airport layout plan, or by any planning document submitted to the FAA by competent authority.

[Amdt. 77-5, 33 FR 5256, Apr. 2, 1968, as amended by Amdt. 77-9, 36 FR 5969, Apr. 1, 1971]

Sec. 77.3 Standards.

(a) The standards established in this part for determining obstructions to air navigation are used by the Administrator in:

(1) Administering the Federal-aid Airport Program and the Surplus Airport Program;

(2) Transferring property of the United States under section 16 of the Federal Airport Act;

(3) Developing technical standards and guidance in the design and construction of airports; and

(4) Imposing requirements for public notice of the construction or alteration of any structure where notice will promote air safety.

(b) The standards used by the Administrator in the establishment of flight procedures and aircraft operational limitations are not set forth in this part but are contained in other publications of the Administrator.

[Doc. No. 1882, 30 FR 1839, Feb. 10, 1965, as amended by Amdt. 77-9, 36 FR 5970, Apr. 1, 1971]

Sec. 77.5 Kinds of Objects Affected.

This part applies to:

(a) Any object of natural growth, terrain, or permanent or temporary construction or alteration, including equipment or materials used therein, and apparatus of a permanent or temporary character; and

(b) Alteration of any permanent or temporary existing structure by a change in its height (including appurtenances), or lateral dimensions, including equipment or materials used therein.

Subpart B — Notice of Construction or Alteration

Sec. 77.11 Scope.

(a) This subpart requires each person proposing any kind of construction or alteration described in Sec. 77.13(a) to give adequate notice to the Administrator. It specifies the locations and dimensions of the construction or alteration for which notice is required and prescribes the form and manner of the notice. It also requires supplemental notices 48 hours before the start and upon the completion of certain construction or alteration that was the subject of a notice under Sec. 77.13(a).

(b) Notices received under this subpart provide a basis for:

(1) Evaluating the effect of the construction or alteration on operational procedures and proposed operational procedures;

(2) Determinations of the possible hazardous effect of the proposed construction or alteration on air navigation;

(3) Recommendations for identifying the construction or alteration in accordance with the current Federal Aviation Administration Advisory Circular AC 70/7460-1 entitled "Obstruction Marking and Lighting," which is available without charge from the Department of Transportation, Distribution Unit, TAD 484.3, Washington, D.C. 20590.

(4) Determining other appropriate measures to be applied for continued safety of air navigation; and

(5) Charting and other notification to airmen of the construction or alteration.

(Sec. 6, 80 Stat. 937, 49 U.S.C. 1655
[Doc. No. 1882, 30 FR 1839, Feb. 10, 1965, as amended by Amdt. 77-8, 33 FR 18614, Dec. 17, 1968; Amdt. 77-10, 37 FR 4705, Mar. 4, 1972]

Sec. 77.13 Construction or Alteration Requiring Notice.

(a) Except as provided in Sec. 77.15, each sponsor who proposes any of the following construction or alteration shall notify the Administrator in the form and manner prescribed in Sec. 77.17:

(1) Any construction or alteration of more than 200 feet in height above the ground level at its site.

(2) Any construction or alteration of greater height than an imaginary surface extending outward and upward at one of the following slopes:

(i) 100 to 1 for a horizontal distance of 20,000 feet from the nearest point of the nearest runway of each airport specified in paragraph (a)(5) of this section with at least one runway more than 3,200 feet in actual length, excluding heliports.

(ii) 50 to 1 for a horizontal distance of 10,000 feet from the nearest point of the nearest runway of each airport specified in paragraph (a)(5) of this section with its longest runway no more than 3,200 feet in actual length, excluding heliports.

(iii) 25 to 1 for a horizontal distance of 5,000 feet from the nearest point of the nearest landing and takeoff area of each heliport specified in paragraph (a)(5) of this section.

(3) Any highway, railroad, or other traverse way for mobile objects, of a height which, if adjusted upward 17 feet for an Interstate Highway that is part of the National System of Military and Interstate Highways where overcrossings are designed for a minimum of 17 feet vertical distance, 15 feet for any other public roadway, 10 feet or the height of the highest mobile object that would normally traverse the road, whichever is greater, for a private road, 23 feet for a railroad, and for a waterway or any other traverse way not previously mentioned, an amount equal to the height of the highest mobile object that would normally traverse it, would exceed a standard of paragraph (a) (1) or (2) of this section.

(4) When requested by the FAA, any construction or alteration that would be in an instrument approach area (defined in the FAA standards governing instrument approach procedures) and available information indicates it might exceed a standard of Subpart C of this part.

(5) Any construction or alteration on any of the following airports (including heliports):

(i) An airport that is available for public use and is listed in the Airport Directory of the current Airman's Information Manual or in either the Alaska or Pacific Airman's Guide and Chart Supplement.

(ii) An airport under construction, that is the subject of a notice or proposal on file with the Federal Aviation Administration, and, except for military airports, it is clearly indicated that that airport will be available for public use.

(iii) An airport that is operated by an armed force of the United States.

(b) Each sponsor who proposes construction or alteration that is the subject of a notice under paragraph (a) of this section and is advised by an FAA regional office that a supplemental notice is required shall submit that notice on a prescribed form to be received by the FAA regional office at least 48 hours before the start of the construction or alteration.

(c) Each sponsor who undertakes construction or alteration that is the subject of a notice under paragraph (a) of this section shall, within 5 days after that construction or alteration reaches its greatest height, submit a supplemental notice on a prescribed form to the FAA regional office having jurisdiction over the region involved, if—

(1) The construction or alteration is more than 200 feet above the surface level of its site; or

(2) An FAA regional office advises him that submission of the form is required.

[Amdt. 77-5, 33 FR 5256, Apr. 2, 1968, as amended by Amdt. 77-9, 36 FR 5970, Apr. 1, 1971; Amdt. 77-10, 37 FR 4705, Mar. 4, 1972]

Sec. 77.15 Construction or Alteration Not Requiring Notice.

No person is required to notify the Administrator for any of the following construction or alteration:

(a) Any object that would be shielded by existing structures of a permanent and substantial character or by natural terrain or topographic features of equal or greater height, and would be located in the congested area of a city, town, or settlement where it is evident beyond all reasonable doubt that the structure so shielded will not adversely affect safety in air navigation.

(b) Any antenna structure of 20 feet or less in height except one that would increase the height of another antenna structure.

(c) Any air navigation facility, airport visual approach or landing aid, aircraft arresting device, or meteorological device, of a type approved by the Administrator, or an appropriate military service on military airports, the location and height of which is fixed by its functional purpose.

(d) Any construction or alteration for which notice is required by any other FAA regulation.

[Doc. No. 1882, 30 FR 1839, Feb. 10, 1965, as amended by Amdt. 77-5, 33 FR 5257, Apr. 2, 1968; Amdt. 77-9, 36 FR 5970, Apr. 1, 1971]

Sec. 77.17 Form and Time of Notice.

(a) Each person who is required to notify the Administrator under Sec. 77.13(a) shall send one executed form set (four copies) of FAA Form 7460-1, Notice of Proposed Construction or Alteration, to the Manager, Air Traffic Division, FAA Regional Office having jurisdiction over the area within which the construction or alteration will be located. Copies of FAA Form 7460-1 may be obtained from the headquarters of the Federal Aviation Administration and the regional offices.

(b) The notice required under Sec. 77.13(a) (1) through (4) must be submitted at least 30 days before the earlier of the following dates:

(1) The date the proposed construction or alteration is to begin.

(2) The date an application for a construction permit is to be filed. However, a notice relating to proposed construction or alteration that is subject to the licensing requirements of the Federal Communications Act may be sent to FAA at the same time the application for construction is filed with the Federal Communications Commission, or at any time before that filing.

(c) A proposed structure or an alteration to an existing structure that exceeds 2,000 feet in height above the ground will be presumed to be a hazard to air navigation and to result in an inefficient utilization of airspace and the applicant has the burden of overcoming that presumption. Each notice submitted under the pertinent provisions of this Part 77 proposing a structure in excess of 2,000 feet above ground, or an alteration that will make an existing structure exceed that height, must contain a detailed showing, directed to meeting this

burden. Only in exceptional cases, where the FAA concludes that a clear and compelling showing has been made that it would not result in an inefficient utilization of the airspace and would not result in a hazard to air navigation, will a determination of no hazard be issued.

(d) In the case of an emergency involving essential public services, public health, or public safety that requires immediate construction or alteration, the 30-day requirement in paragraph (b) of this section does not apply and the notice may be sent by telephone, telegraph, or other expeditious means, with an executed FAA Form 7460-1 submitted within 5 days thereafter. Outside normal business hours, emergency notices by telephone or telegraph may be submitted to the nearest FAA Flight Service Station.

(e) Each person who is required to notify the Administrator by paragraph (b) or (c) of Sec. 77.13, or both, shall send an executed copy of FAA Form 117-1, Notice of Progress of Construction or Alteration, to the Manager, Air Traffic Division, FAA Regional Office having jurisdiction over the area involved.

(Sec. 6, 80 Stat. 937, 49 U.S.C. 1655
[Doc. No. 1882, 30 FR 1839, Feb. 10, 1965, as amended by Amdt. 77-2, 31 FR 9449, July 12, 1966; Amdt. 77-8, 33 FR 18614, Dec. 17, 1968; Amdt. 77-10, 37 FR 4705, Mar. 4, 1972; Amdt. 77-11, 54 FR 39292, Sept. 25, 1989]

Sec. 77.19 Acknowledgment of Notice.

(a) The FAA acknowledges in writing the receipt of each notice submitted under Sec. 77.13(a).

(b) If the construction or alteration proposed in a notice is one for which lighting or marking standards are prescribed in the FAA Advisory Circular AC 70/7460-1, entitled "Obstruction Marking and Lighting," the acknowledgment contains a statement to that effect and information on how the structure should be marked and lighted in accordance with the manual.

(c) The acknowledgment states that an aeronautical study of the proposed construction or alteration has resulted in a determination that the construction or alteration:

(1) Would not exceed any standard of Subpart C and would not be a hazard to air navigation;

(2) Would exceed a standard of Subpart C but would not be a hazard to air navigation; or

(3) Would exceed a standard of Subpart C and further aeronautical study is necessary to determine whether it would be a hazard to air navigation, that the sponsor may request within 30 days that further study, and that, pending completion of any further study, it is presumed the construction or alteration would be a hazard to air navigation.

[Doc. No. 1882, 30 FR 1839, Feb. 10, 1965, as amended by Amdt. 77-4, 32 FR 12997, Sept. 13, 1967; Amdt. 77-5, 33 FR 5257, Apr. 2, 1968

Subpart C — Obstruction Standards

Sec. 77.21 Scope.

(a) This subpart establishes standards for determining obstructions to air navigation. It applies to existing and proposed manmade objects, objects of natural growth, and terrain. The standards apply to the use of navigable airspace by aircraft and to existing air navigation facilities, such as an air navigation aid, airport, Federal airway, instrument approach or departure procedure, or approved off-airway route. Additionally, they apply to a planned facility or use, or a change in an existing facility or use, if a proposal therefore is on file with the Federal Aviation Administration or an appropriate military service on the date the notice required by Sec. 77.13(a) is filed.

(b) At those airports having defined runways with specially prepared hard surfaces, the primary surface for each such runway extends 200 feet beyond each end of the runway. At those airports having defined strips or pathways that are used regularly for the taking off and landing of aircraft and have been designated by appropriate authority as runways, but do not have specially prepared hard surfaces, each end of the primary surface for each such runway shall coincide with the corresponding end of the runway. At those airports, excluding seaplane bases, having a defined landing and takeoff area with no defined pathways for the landing and taking off of aircraft, a determination shall be made as to which portions of the landing and takeoff area are regularly used as landing and takeoff pathways. Those pathways so determined shall be considered runways and an appropriate primary surface as defined in Sec. 77.25(c) will be considered as being longitudinally centered on each runway so determined, and each end of that primary surface shall coincide with the corresponding end of that runway.

(c) The standards in this subpart apply to the effect of construction or alteration proposals upon an airport if, at the time of filing of the notice required by Sec. 77.13(a), that airport is—

(1) Available for public use and is listed in the Airport Directory of the current Airman's Information Manual or in either the Alaska or Pacific Airman's Guide and Chart Supplement; or

(2) A planned or proposed airport or an airport under construction, that is the subject of a notice or proposal on file with the Federal Aviation Administration, and, except for military airports, it is clearly indicated that that airport will be available for public use; or,

(3) An airport that is operated by an armed force of the United States.

[Doc. No. 1882, 30 FR 1839, Feb. 10, 1965, as amended by Amdt. 77-5, 33 FR 5257, Apr. 2, 1968; Amdt. 77-9, 36 FR 5970, Apr. 1, 1971]

Sec. 77.23 Standards for Determining Obstructions.

(a) An existing object, including a mobile object, is, and a future object would be an obstruction to air navigation if it is of greater height than any of the following heights or surfaces:

(1) A height of 500 feet above ground level at the site of the object.

(2) A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within 3 nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 500 feet.

(3) A height within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area, which would result in the vertical distance between any point on the object and an established minimum instrument flight altitude within that area or segment to be less than the required obstacle clearance.

(4) A height within an en route obstacle clearance area, including turn and termination areas, of a Federal airway or approved off-airway route, that would increase the minimum obstacle clearance altitude.

(5) The surface of a takeoff and landing area of an airport or any imaginary surface established under Sec. 77.25, Sec. 77.28, or Sec. 77.29. However, no part of the take-off or landing area itself will be considered an obstruction.

(b) Except for traverse ways on or near an airport with an operative ground traffic control service, furnished by an air traffic control tower or by the airport management and coordinated with the air traffic control service, the standards of paragraph (a) of this section apply to traverse ways used or to be used for the passage of mobile objects only after the heights of these traverse ways are increased by:

(1) Seventeen feet for an Interstate Highway that is part of the National System of Military and Interstate Highways where overcrossings are designed for a minimum of 17 feet vertical distance.

(2) Fifteen feet for any other public roadway.

(3) Ten feet or the height of the highest mobile object that would normally traverse the road, whichever is greater, for a private road.

(4) Twenty-three feet for a railroad, and,

(5) For a waterway or any other traverse way not previously mentioned, an amount equal to the height of the highest mobile object that would normally traverse it.

[Amdt. 77-9, 36 FR 5970, Apr. 1, 1971]

Sec. 77.25 Civil Airport Imaginary Surfaces.

The following civil airport imaginary surfaces are established with relation to the airport and to each runway. The size of each such imaginary surface is based on the category of each runway according to the type of approach available or planned for that runway. The slope and dimensions of the approach surface applied to each end of a runway are determined by the most precise approach existing or planned for that runway end.

(a) Horizontal surface. A horizontal plane 150 feet above the established airport elevation, the perimeter of which is constructed by swinging arcs of specified radii from the center of each end of the primary surface of each runway of each airport and connecting the adjacent arcs by lines tangent to those arcs. The radius of each arc is:

(1) 5,000 feet for all runways designated as utility or visual;

(2) 10,000 feet for all other runways. The radius of the arc specified for each end of a runway will have the same arithmetical value. That value will be the highest determined for either end of the runway. When a 5,000-foot arc is encompassed by tangents connecting two adjacent 10,000-foot arcs, the 5,000-foot arc shall be disregarded on the construction of the perimeter of the horizontal surface.

(b) Conical surface. A surface extending outward and upward from the periphery of the horizontal surface at a slope of 20 to 1 for a horizontal distance of 4,000 feet.

(c) Primary surface. A surface longitudinally centered on a runway. When the runway has a specially prepared hard surface, the primary surface extends 200 feet beyond each end of that runway; but when the runway has no specially prepared hard surface, or planned hard surface, the primary surface ends at each end of that runway. The elevation of any point on the primary surface is the same as the elevation of the nearest point on the runway centerline. The width of a primary surface is:

(1) 250 feet for utility runways having only visual approaches.

(2) 500 feet for utility runways having nonprecision instrument approaches.

(3) For other than utility runways the width is:

(i) 500 feet for visual runways having only visual approaches.

(ii) 500 feet for nonprecision instrument runways having visibility minimums greater than three-fourths statute mile.

(iii) 1,000 feet for a nonprecision instrument runway having a nonprecision instrument approach with visibility minimums as low as three-fourths of a statute mile, and for precision instrument runways. The width of the primary surface of a runway will be that width prescribed in this section for the most precise approach existing or planned for either end of that runway.

(d) Approach surface. A surface longitudinally centered on the extended runway centerline and extending outward and upward from each end of the primary surface. An approach surface is applied to each end of each runway based upon the type of approach available or planned for that runway end.

(1) The inner edge of the approach surface is the same width as the primary surface and it expands uniformly to a width of:

(i) 1,250 feet for that end of a utility runway with only visual approaches;

(ii) 1,500 feet for that end of a runway other than a utility runway with only visual approaches;

(iii) 2,000 feet for that end of a utility runway with a nonprecision instrument approach;

(iv) 3,500 feet for that end of a nonprecision instrument runway other than utility, having visibility minimums greater than three-fourths of a statute mile;

(v) 4,000 feet for that end of a nonprecision instrument runway, other than utility, having a nonprecision instrument approach with visibility minimums as low as three-fourths statute mile; and

(vi) 16,000 feet for precision instrument runways.

(2) The approach surface extends for a horizontal distance of:

(i) 5,000 feet at a slope of 20 to 1 for all utility and visual runways;

(ii) 10,000 feet at a slope of 34 to 1 for all nonprecision instrument runways other than utility; and,

(iii) 10,000 feet at a slope of 50 to 1 with an additional 40,000 feet at a slope of 40 to 1 for all precision instrument runways.

(3) The outer width of an approach surface to an end of a runway will be that width prescribed in this subsection for the most precise approach existing or planned for that runway end.

(e) Transitional surface. These surfaces extend outward and upward at right angles to the runway centerline and the runway centerline extended at a slope of 7 to 1 from the sides of the primary surface and from the sides of the approach surfaces. Transitional surfaces for those portions of the precision approach surface which project through and beyond the limits of the conical surface, extend a distance of 5,000 feet measured horizontally from the edge of the approach surface and at right angles to the runway centerline.

[Amdt. 77-9, 36 FR 5970, Apr. 1, 1971; 36 FR 6741, Apr. 8, 1971]

Sec. 77.27 [Reserved]

Sec. 77.28 Military airport imaginary surfaces.

(a) Related to airport reference points. These surfaces apply to all military airports. For the purposes of this section a military airport is any airport operated by an armed force of the United States.

(1) Inner horizontal surface. A plane is oval in shape at a height of 150 feet above the established airfield elevation. The plane is constructed by scribing an arc with a radius of 7,500 feet about the centerline at the end of each runway and interconnecting these arcs with tangents.

(2) Conical surface. A surface extending from the periphery of the inner horizontal surface outward and upward at a slope of 20 to 1 for a horizontal distance of 7,000 feet to a height of 500 feet above the established airfield elevation.

(3) Outer horizontal surface. A plane, located 500 feet above the established airfield elevation, extending outward from the outer periphery of the conical surface for a horizontal distance of 30,000 feet.

(b) Related to runways. These surfaces apply to all military airports.

(1) Primary surface. A surface located on the ground or water longitudinally centered on each runway with the same length as the runway. The width of the primary surface for runways is 2,000 feet. However, at established bases where substantial construction has taken place in accordance with a previous lateral clearance criteria, the 2,000-foot width may be reduced to the former criteria.

(2) Clear zone surface. A surface located on the ground or water at each end of the primary surface, with a length of 1,000 feet and the same width as the primary surface.

(3) Approach clearance surface. An inclined plane, symmetrical about the runway centerline extended, beginning 200 feet beyond each end of the primary surface at the centerline elevation of the runway end and extending for 50,000 feet. The slope of the approach clearance surface is 50 to 1 along the runway centerline extended until it reaches an elevation of 500 feet above the established airport elevation. It then continues horizontally at this elevation to a point 50,000 feet from the point of beginning. The width of this surface at the runway end is the same as the primary surface, it flares uniformly, and the width at 50,000 is 16,000 feet.

(4) Transitional surfaces. These surfaces connect the primary surfaces, the first 200 feet of the clear zone surfaces, and the approach clearance surfaces to the inner horizontal surface, conical surface, outer horizontal surface or other transitional surfaces. The slope of the transitional surface is 7 to 1 outward and upward at right angles to the runway centerline.

[Doc. No. 1882, 30 FR 1839, Feb. 10, 1965, as amended by Amdt. 77-1, 30 FR 6713, May 18, 1965; Amdt. 77-9, 36 FR 5971, Apr. 1, 1971]

Sec. 77.29 Airport Imaginary Surfaces for Heliports.

(a) Heliport primary surface. The area of the primary surface coincides in size and shape with the designated take-off and landing area of a heliport. This surface is a horizontal plane at the elevation of the established heliport elevation.

(b) Heliport approach surface. The approach surface begins at each end of the heliport primary surface with the same width as the primary surface, and extends outward and upward for a horizontal distance of 4,000 feet where its width is 500 feet. The slope of the approach surface is 8 to 1 for civil heliports and 10 to 1 for military heliports.

(c) Heliport transitional surfaces. These surfaces extend outward and upward from the lateral boundaries of the heliport primary surface and from the approach surfaces at a slope of 2 to 1 for a distance of 250 feet measured horizontally from the centerline of the primary and approach surfaces.

[Doc. No. 1882, 30 FR 1839, Feb. 10, 1965, as amended by Amdt. 77-9, 36 FR 5971, Apr. 1, 1971; 36 FR 6741, Apr. 8, 1971]

Subpart D — Aeronautical Studies of Effect of Proposed Construction on Navigable Airspace

Sec. 77.31 Scope.

(a) This subpart applies to the conduct of aeronautical studies of the effect of proposed construction or alteration on the use of air navigation facilities or navigable airspace by aircraft. In the aeronautical studies, present and future IFR and VFR aeronautical operations and procedures are reviewed and any possible changes in those operations and procedures and in the construction proposal that would eliminate or alleviate the conflicting demands are ascertained.

(b) The conclusion of a study made under this subpart is normally a determination as to whether the specific proposal studied would be a hazard to air navigation.

[Doc. No. 1882, 30 FR 1839, Feb. 10, 1965, as amended by Amdt. 77-6, 33 FR 10843, July 31, 1968]

Sec. 77.33 Initiation of Studies.

(a) An aeronautical study is conducted by the FAA:

(1) Upon the request of the sponsor or any construction or alteration for which a notice is submitted under Subpart B of this part, unless that construction or alteration would be located within an antenna farm area established under Subpart F of this part; or

(2) Whenever the FAA determines it appropriate.

[Doc. No. 1882, 30 FR 1839, Feb. 10, 1965, as amended by Amdt. 77-4, 32 FR 12997, Sept. 13, 1967]

Sec. 77.35 Aeronautical Studies.

(a) The Regional Manager, Air Traffic Division of the region in which the proposed construction or alteration would be located, or his designee, conducts the aeronautical study of the effect of the proposal upon the operation of air navigation facilities and the safe and efficient utilization of the navigable airspace. This study may include the physical and electromagnetic radiation effect the proposal may have on the operation of an air navigation facility.

(b) To the extent considered necessary, the Regional Manager, Air Traffic Division or his designee:

(1) Solicits comments from all interested persons;

(2) Explores objections to the proposal and attempts to develop recommendations for adjustment of aviation requirements that would accommodate the proposed construction or alteration;

(3) Examines possible revisions of the proposal that would eliminate the exceeding of the standards in Subpart C of this part; and

(4) Convenes a meeting with all interested persons for the purpose of gathering all facts relevant to the effect of the proposed construction or alteration on the safe and efficient utilization of the navigable airspace.

(c) The Regional Manager, Air Traffic Division or his designee issues a determination as to whether the proposed construction or alteration would be a hazard to air navigation and sends copies to all known interested persons. This determination is final unless a petition for review is granted under Sec. 77.37.

(d) If the sponsor revises his proposal to eliminate exceeding of the standards of Subpart C of this part, or withdraws it, the Regional Manager, Air Traffic Division, or his designee, terminates the study and notifies all known interested persons.

[Doc. No. 1882, 30 FR 1839, Feb. 10, 1965, as amended by Amdt. 77-6, 33 FR 10843, July 31, 1968; Amdt. 77-11, 54 FR 39292, Sept. 25, 1989]

Sec. 77.37 Discretionary Review.

(a) The sponsor of any proposed construction or alteration or any person who stated a substantial aeronautical objection to it in an aeronautical study, or any person who has a substantial aeronautical objection to it but was not given an opportunity to state it, may petition the Administrator, within 30 days after issuance of the determination under Sec. 77.19 or Sec. 77.35 or revision or extension of the determination under Sec. 77.39(c), for a review of the determination, revision, or extension. This paragraph does not apply to any acknowledgment issued under Sec. 77.19(c)(1).

(b) The petition must be in triplicate and contain a full statement of the basis upon which it is made.

(c) The Administrator examines each petition and decides whether a review will be made and, if so, whether it will be:

(1) A review on the basis of written materials, including study of a report by the Regional Manager, Air Traffic Division of the aeronautical study, briefs, and related submissions by any interested party, and other relevant facts, with the Administrator affirming, revising, or reversing the determination issued under Sec. 77.19, Sec. 77.35 or Sec. 77.39(c); or

(2) A review on the basis of a public hearing, conducted in accordance with the procedures prescribed in Subpart E of this part.

[Doc. No. 1882, 30 FR 1839, Feb. 10, 1965, as amended by Amdt. 77-3, 32 FR 6970, May 6, 1967; Amdt. 77-11, 54 FR 39292, Sept. 25, 1989]

Sec. 77.39 Effective Period of Determination of No Hazard.

(a) Unless it is otherwise extended, revised, or terminated, each final determination of no hazard made under this subpart or Subpart B or E of this part expires 18 months after its effective date, regardless of whether the proposed construction or alteration has been started, or on the date the proposed construction or alteration is abandoned, whichever is earlier.

(b) In any case, including a determination to which paragraph (d) of this section applies, where the proposed construction or alteration has not been started during the applicable period by actual structural work, such as the laying of a foundation, but not including excavation, any interested person may, at least 15 days before the date the final determination expires, petition the FAA official who issued the determination to:

(1) Revise the determination based on new facts that change the basis on which it was made; or

(2) Extend its effective period.

(c) The FAA official who issued the determination reviews each petition presented under paragraph (b) of this section, and revises, extends, or affirms the determination as indicated by his findings.

(d) In any case in which a final determination made under this subpart or Subpart B or E of this part relates to proposed construction or alteration that may not be started unless the Federal Communications Commission issues an appropriate construction permit, the effective period of each final determination includes—

(1) The time required to apply to the Commission for a construction permit, but not more than 6 months after the effective date of the determination; and

(2) The time necessary for the Commission to process the application except in a case where the Administrator determines a shorter effective period is required by the circumstances.

(e) If the Commission issues a construction permit, the final determination is effective until the date prescribed for completion of the construction. If the Commission refuses to issue a construction permit, the final determination expires on the date of its refusal.

[Doc. No. 1882, 30 FR 1839, Feb. 10, 1965, as amended by Amdt. 77-5, 33 FR 5257, Apr. 2, 1968]

Subpart E — Rules of Practice for Hearings Under Subpart D

Sec. 77.41 Scope.

This subpart applies to hearings held by the FAA under Titles I, III, and X of the Federal Aviation Act of 1958 (49 U.S.C. Subchapters I, III, and X), on proposed construction or alteration that affects the use of navigable airspace.

Sec. 77.43 Nature of Hearing.

Sections 4, 5, 7, and 8 of the Administrative Procedure Act (5 U.S.C. 1003, 1004, 1006, and 1007) do not apply to hearings held on proposed construction or alteration to determine its effect on the safety of aircraft and the efficient use of navigable airspace because those hearings are fact-finding in nature. As a fact-finding procedure, each hearing is nonadversary and there are no formal pleadings or adverse parties.

Sec. 77.45 Presiding Officer.

(a) If, under Sec. 79.37, the Administrator grants a public hearing on any proposed construction or alteration covered by this part, the Director, Air Traffic Operations Service designates an FAA employee to be the presiding officer at the hearing.

(b) The presiding officer may:

(1) Give notice of the date and location of the hearing and any prehearing conference that may be held;

(2) Administer oaths and affirmations;

(3) Examine witnesses;

(4) Issue subpoenas and take depositions or have them taken;

(5) Obtain, in the form of a public record, all pertinent and relevant facts relating to the subject matter of the hearing;

(6) Rule, with the assistance of the legal officer, upon the admissibility of evidence;

(7) Regulate the course and conduct of the hearing; and

(8) Designate parties to the hearing and revoke those designations.

[Doc. No. 1882, 30 FR 1839, Feb. 10, 1965, as amended by Amdt. 77-11, 54 FR 39292, Sept. 25, 1989]

Sec. 77.47 Legal Officer.

The Chief Counsel designates a member of his staff to serve as legal officer at each hearing under this subpart. The legal officer may examine witnesses and assist and advise the presiding officer on questions of evidence or other legal questions arising during the hearing.

[Doc. No. 1882, 30 FR 1839, Feb. 10, 1965, as amended at 38 FR 26444, Sept. 17, 1973]

Sec. 77.49 Notice of Hearing.

In designating a time and place for a hearing under this subpart the presiding officer considers the needs of the FAA and the convenience of the parties and witnesses. The time and place of each hearing is published in the "Notices" section of the Federal Register before the date of the hearing, unless the notice is impractical or unnecessary.

Sec. 77.51 Parties to the Hearing.

The presiding officer designates the following as parties to the hearing—

(a) The proponent of the proposed construction or alteration.

(b) Those persons whose activities would be substantially affected by the proposed construction or alteration.

Sec. 77.53 Prehearing Conference.

(a) The presiding officer may, in his discretion, hold a prehearing conference with the parties to the hearing and the legal officer before the hearing.

(b) At the direction of the presiding officer, each party to a prehearing conference shall submit a brief written statement of the evidence he intends to provide through his witnesses and by questioning other witnesses at the hearing, and shall provide enough copies of the statement so that the presiding officer may keep three for the FAA and give one to each other party.

(c) At the prehearing conference, the presiding officer reduces and simplifies the subject matter of the hearing so far as possible and advises the parties of the probable order of presenting the evidence.

Sec. 77.55 Examination of Witnesses.

(a) Each witness at a hearing under this subpart shall, after being sworn by the presiding officer, give his testimony under oath.

(b) The party for whom a witness, other than an employee of the FAA, is testifying shall examine that witness. After that examination, other parties to the hearing may examine the witness, in the order fixed by the presiding officer. The presiding officer and the legal officer may then examine the witness. The presiding officer may grant any party an additional opportunity to examine any witness, if that party adequately justifies the additional examination.

(c) The legal officer examines each FAA employee who is a witness, before the other parties examine him. After that examination, the order prescribed in paragraph (b) of this section applies. An FAA employee may testify only as to facts within his personal knowledge and the application of FAA regulations, standards, and policies.

Sec. 77.57 Evidence.

(a) The presiding officer receives all testimony and exhibits that are relevant to the issues of the hearing. So far as possible, each party shall submit enough copies of his exhibits that the presiding officer may keep three copies for the FAA and give one to each other party.

(b) The presiding officer excludes any testimony that is irrelevant, unduly repetitious, or consists of statements made during an aeronautical study in an effort to reconcile or compromise aviation or construction or alteration requirements. A party to the hearing may object to the admission of evidence only on the ground that it is irrelevant.

Sec. 77.59 Subpoenas of Witnesses and Exhibits.

(a) The presiding officer of a hearing may issue subpoenas for any witness or exhibit that he determines may be material and relevant to the issues of the hearing. So far as possible, each party to the hearing shall provide the witnesses and exhibits that he intends to present at the hearing.

(b) If any party to the hearing is unable to provide his necessary witnesses and exhibits, he shall advise the presiding officer far enough in advance that the presiding officer can determine whether he should issue subpoenas for the desired witnesses or exhibits.

Sec. 77.61 Revision of Construction or Alteration Proposal.

(a) The sponsor of any proposed construction or alteration covered by this part may revise his proposal at any time before or during the hearing. If he revises it, the presiding officer decides whether the revision affects the proposal to the extent that he should send it to the Administrator for a redetermination of the need for a hearing.

(b) If the presiding officer decides that it does not need to be resubmitted to the Administrator, he advises the parties of the revised proposal and takes the action necessary to allow all parties to effectively participate in the hearing on the revised proposal. Without limiting his discretion, the presiding officer may recess and reconvene the hearing, or hold another prehearing conference.

Sec. 77.63 Record of Hearing.

(a) Each hearing is recorded verbatim by an official reporter under an FAA contract. The transcript, and all exhibits, become a part of the record of the hearing.

(b) Any person may buy a copy of the transcript of the hearing from the reporter at the price fixed for it.

(c) The presiding officer may allow any party to withdraw an original document if he submits authenticated copies of it.

(d) Any person may buy, from the FAA, photostatic copies of any exhibit by paying the copying costs.

(e) A change in the official transcript of a hearing may be made only if it involves an error of substance. Any recommendation to correct the transcript must be filed with the presiding officer within 5 days after the hearing closes. The presiding officer reviews each request for a correction to the extent he considers appropriate and shall make any revisions that he finds appropriate as a result of that review.

Sec. 77.65 Recommendations by Parties.

Within 20 days after the mailing of the record of hearing by the official reporter, or as otherwise directed by the presiding officer, each party may submit to the presiding officer five copies of his recommendations for a final decision to be made by the Administrator.

Sec. 77.67 Final Decision of the Administrator.

After reviewing the evidence relevant to the questions of fact in a hearing, including the official transcript and the exhibits, the Administrator resolves all these questions, based on the weight of evidence, and makes his determination, stating the basis and reasons for it. He then issues an appropriate order to be served on each of the parties.

Sec. 77.69 Limitations on Appearance and Representation.

(a) A former officer or employee of the FAA may not appear on behalf of, or represent, any party before the FAA in connection with any matter to which this part applies, if he considered or passed on that matter while he was an officer or employee of the FAA.

(b) A person appearing before the FAA on any matter to which this part applies may not, in connection with that appearance, knowingly accept assistance from, or share fees with, any person who is prohibited by paragraph (a) of this section, from appearing himself on that matter.

(c) A former official or employee of the FAA may not, within 6 months after he ceases to be such an officer or employee, appear before the FAA on behalf of, or represent, any party in connection with any proceeding that was pending under this part while he was an officer or employee of the FAA, unless he obtains written consent from an appropriate officer of the FAA, based on a verified showing that he did not personally consider the matter concerned or gain particular knowledge of it while he was an officer or employee of the FAA.

Subpart F — Establishment of Antenna Farm Areas

Sec. 77.71 Scope.

(a) This subpart establishes antenna farm areas in which antenna structures may be grouped to localize their effect on the use of navigable airspace.

(b) It is the policy of the FAA to encourage the use of antenna farms and the single structure-multiple antenna concept for radio and television towers whenever possible. In considering proposals for establishing antenna farm areas, it considers as far as possible the revision of aeronautical procedures and operations to accommodate antenna structures that will fulfill broadcasting requirements.

Sec. 77.73 General Provisions.

(a) An antenna farm area consists of a specified geographical location with established dimensions of area and height, where antenna towers with a common impact on aviation may be grouped. Each such area is established by appropriate rule making action.

(b) Each proposal for an antenna farm area is evaluated on the basis of its effect on the use of navigable airspace. The views of the Federal Communications Commission are requested on the effect that each establishment of an antenna farm area would have on its statutory responsibilities. Any views submitted by it are fully considered before the antenna farm concerned is established. If the Commission advises that the establishment of any proposed antenna farm area would interfere with its statutory responsibility, the proposed area is not established.

(c) The establishment of an antenna farm area is considered whenever it is proposed by:

(1) The FAA;

(2) The Federal Communications Commission;

(3) The sponsor of a proposed antenna tower; or

(4) Any other person having a substantial interest in a proposed antenna tower.

[Doc. No. 1882, 30 FR 1839, Feb. 10, 1965, as amended by Amdt. 77-10, 37 FR 4705, Mar. 4, 1972]

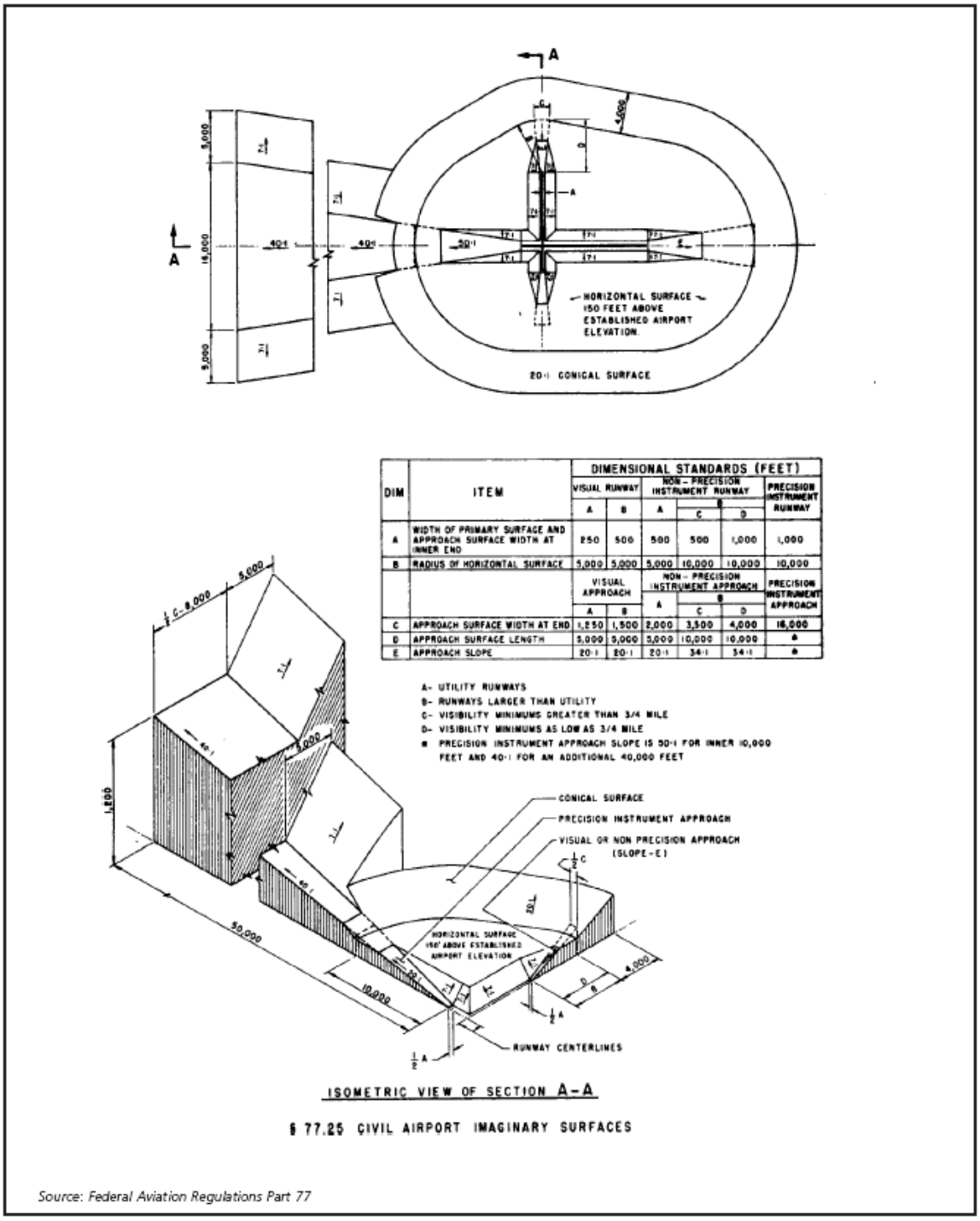
Sec. 77.75 Establishment of Antenna Farm Areas.

The airspace areas described in the following sections of this subpart are established as antenna farm areas.

Note: Sections 77.77 through 77.1100 reserved for descriptions of antenna farm areas.

14 CFR Part 77 * Amendment 77-12 * Dec. 28, 1995.

FIGURE C-1
FAR PART 77 IMAGINARY SURFACES



DIM	ITEM	DIMENSIONAL STANDARDS (FEET)					
		VISUAL RUNWAY		NON-PRECISION INSTRUMENT RUNWAY			PRECISION INSTRUMENT RUNWAY
		A	B	A	B C	B D	
A	WIDTH OF PRIMARY SURFACE AND APPROACH SURFACE WIDTH AT INNER END	250	500	500	500	1,000	1,000
B	RADIUS OF HORIZONTAL SURFACE	5,000	5,000	5,000	10,000	10,000	10,000
		VISUAL APPROACH		NON-PRECISION INSTRUMENT APPROACH			PRECISION INSTRUMENT APPROACH
		A	B	A	B C	B D	
C	APPROACH SURFACE WIDTH AT END	1,250	1,500	2,000	3,500	4,000	16,000
D	APPROACH SURFACE LENGTH	5,000	5,000	5,000	10,000	10,000	*
E	APPROACH SLOPE	20:1	20:1	20:1	34:1	34:1	*

A- UTILITY RUNWAYS
B- RUNWAYS LARGER THAN UTILITY
C- VISIBILITY MINIMUMS GREATER THAN 3/4 MILE
D- VISIBILITY MINIMUMS AS LOW AS 3/4 MILE
* PRECISION INSTRUMENT APPROACH SLOPE IS 50:1 FOR INNER 10,000 FEET AND 40:1 FOR AN ADDITIONAL 40,000 FEET

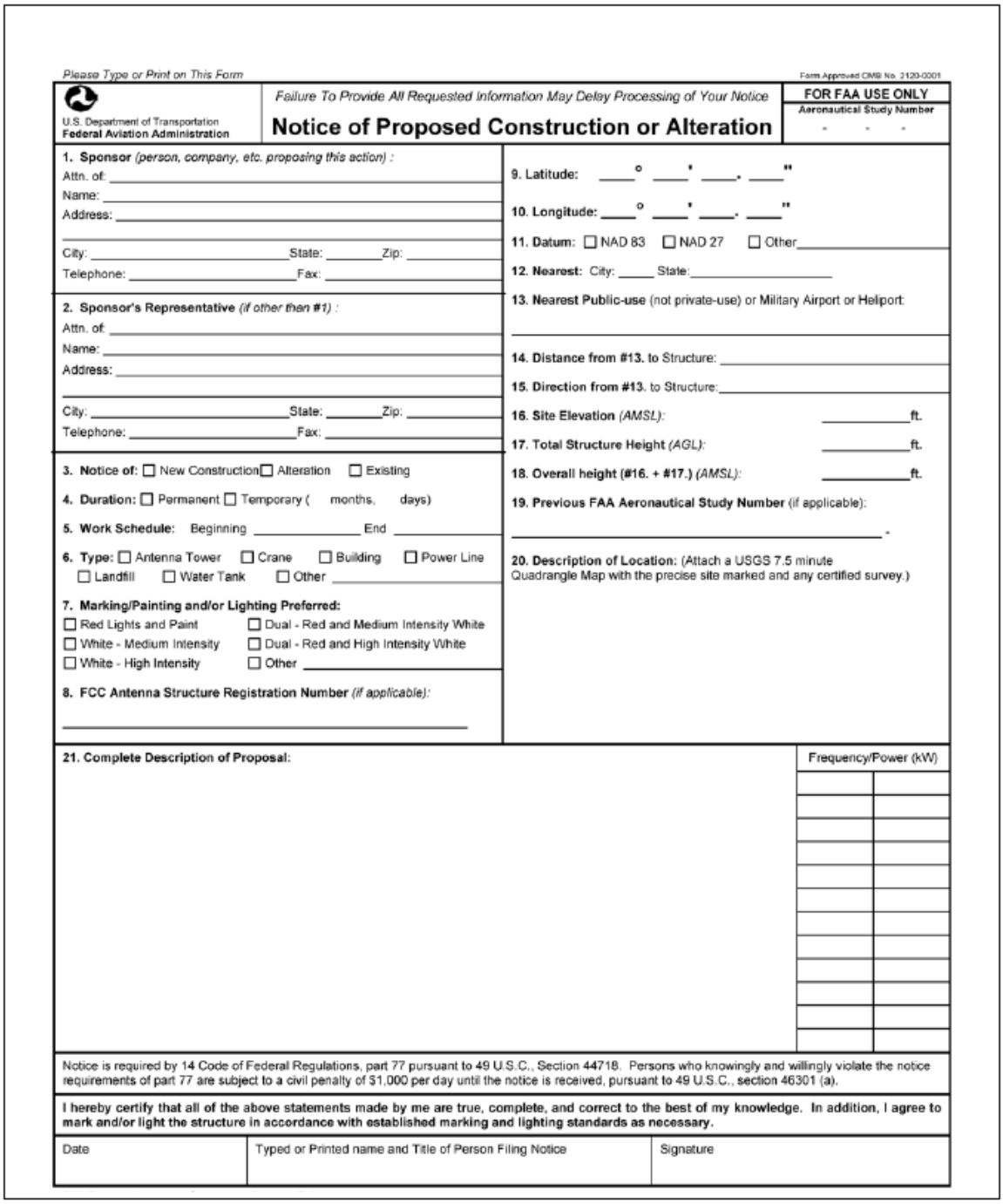
ISOMETRIC VIEW OF SECTION A-A

§ 77.25 CIVIL AIRPORT IMAGINARY SURFACES

Source: Federal Aviation Regulations Part 77

Source: Caltrans, *California Airport Land Use Planning Handbook*, January 2002.

FIGURE B-2
NOTIFICATION OF PROPOSED CONSTRUCTION OR ALTERATION (FAA FORM 7460)



Please Type or Print on This Form — Form Approved OMB No. 2120-0001

U.S. Department of Transportation
Federal Aviation Administration

Failure To Provide All Requested Information May Delay Processing of Your Notice

Notice of Proposed Construction or Alteration

FOR FAA USE ONLY
Aeronautical Study Number
- - -

1. Sponsor *(person, company, etc. proposing this action)* :
Attn. of: _____
Name: _____
Address: _____
City: _____ State: _____ Zip: _____
Telephone: _____ Fax: _____

2. Sponsor's Representative *(if other than #1)* :
Attn. of: _____
Name: _____
Address: _____
City: _____ State: _____ Zip: _____
Telephone: _____ Fax: _____

3. Notice of: ☐ New Construction ☐ Alteration ☐ Existing

4. Duration: ☐ Permanent ☐ Temporary (months, days)

5. Work Schedule: Beginning _____ End _____

6. Type: ☐ Antenna Tower ☐ Crane ☐ Building ☐ Power Line
☐ Landfill ☐ Water Tank ☐ Other _____

7. Marking/Painting and/or Lighting Preferred:
☐ Red Lights and Paint ☐ Dual - Red and Medium Intensity White
☐ White - Medium Intensity ☐ Dual - Red and High Intensity White
☐ White - High Intensity ☐ Other _____

8. FCC Antenna Structure Registration Number *(if applicable)*:
_____

9. Latitude: ____° ____' ____. ____"

10. Longitude: ____° ____' ____. ____"

11. Datum: ☐ NAD 83 ☐ NAD 27 ☐ Other _____

12. Nearest: City: _____ State: _____

13. Nearest Public-use (not private-use) or Military Airport or Heliport:
_____

14. Distance from #13. to Structure: _____

15. Direction from #13. to Structure: _____

16. Site Elevation *(AMSL)*: _____ ft.

17. Total Structure Height *(AGL)*: _____ ft.

18. Overall height (#16. + #17.) *(AMSL)*: _____ ft.

19. Previous FAA Aeronautical Study Number (if applicable):
_____ .

20. Description of Location: (Attach a USGS 7.5 minute Quadrangle Map with the precise site marked and any certified survey.)

21. Complete Description of Proposal:

Frequency/Power (kW)	

Notice is required by 14 Code of Federal Regulations, part 77 pursuant to 49 U.S.C., Section 44718. Persons who knowingly and willingly violate the notice requirements of part 77 are subject to a civil penalty of $1,000 per day until the notice is received, pursuant to 49 U.S.C., section 46301 (a).

I hereby certify that all of the above statements made by me are true, complete, and correct to the best of my knowledge. In addition, I agree to mark and/or light the structure in accordance with established marking and lighting standards as necessary.

Date	Typed or Printed name and Title of Person Filing Notice	Signature

Source: Caltrans, *California Airport Land Use Planning Handbook*, January 2002.

Appendix D
Methods for Determining Concentrations of People

APPENDIX D
Methods for Determining Concentrations of People

Introduction

The underlying compatibility criterion used in this ALUCP is "usage intensity", or more specifically, the maximum number of people per acre that can be present in a given location at any given time. Actions considered "incompatible" with the compatibility planning policies in this ALUCP would be uses that exceed the maximum intensity. Usage intensity is identified in the *California Airport Land Use Planning Handbook* (Caltrans, January 2002) as the means best suited for assessing land use safety compatibility for airports. Recognition, however, must be given to the fact that "people per acre" is not a common measure employed in other facets of land use planning. As such, this ALUCP utilizes the more common measure of floor area ratio (FAR) as a means of applying usage criteria.

Counting People

Determining the number of people expected to use a facility at a single point in time involves estimating not just employees, but customers and visitors as well. Exceptions can be made in rare situations when a facility is used for an event it is not designed for (i.e, when a parking lot is used for a fairground), and it is expected that extra precautions be taken as appropriate.

In ideal situations, the actual or intended number of people for which a facility is designed would be known. However, many buildings are constructed without a specific number of occupants in mind, and the use of the site remains unknown until a tenant is found. Other uses can further compound the question of usage intensity when they are open, or have no fixed seating, like malls and athletic fields for example.

Given the lack of measurable occupancy numbers, other sources can be used to determine the number of people in a proposed development.

- *Parking Ordinance*: The number of people present in a given area can be calculated based upon the number of parking spaces provided. Some assumption regarding the number of people per vehicle needs to be developed to calculate the number of people on-site. The number of people per acre can then be calculated by dividing the number of people on-site by the size of the parcel in acres. This approach is appropriate where the use is expected to be dependent upon access by vehicles. Depending upon the specific

assumptions utilized, this methodology typically results in a number in the low end of the likely intensity for a given land use.

- *Maximum Occupancy*: The Uniform or California Building Code (CBC) can be used as a standard for determining the maximum occupancy of certain uses. The chart provided in Table D-1 indicates the required number of square feet per occupant. The number of people on the site can be calculated by dividing the total floor area of a proposed use by the minimum square feet per occupant requirement listed in the table.

Sample calculations based upon parking space requirements and the Uniform Building Code are provided in Exhibit D-1.

Calculating Usage Intensities

Once the number of people expected to be present over an entire site has been estimated, the usage intensity can be determined. The criteria presented in Chapter 3 of this ALUCP were developed in terms of average intensity over the project site as a whole.

The average intensity is developed by dividing the total number of people expected to use a site by the size of the site itself (e.g., 400 people / 5 acre site = average intensity of 80 people per acre). Once the average usage intensity of a proposed project has been determined, the results can be compared with the criteria set forth in this ALUCP in order to determine consistency.

Calculating Floor Area Ratio

Floor area ration (FAR), the gross square footage of the building(s) on a site divided by the site size, is a more common measure in land use planning than usage intensity calculations. As such, FAR criteria, as seen in Table 3-2, were integrated into this ALUCP in order to establish usage intensity limits for various types of nonresidential land uses.

FAR, however, does not directly relate to the underlying issue of risk due to the fact that the FAR for different types of buildings can be the same despite their level of use (e.g., a warehouse versus a restaurant). Therefore, in order to make FAR applicable to land use compatibility planning, a connection between usage intensity and FAR needed to be established. To achieve this, assumptions, rooted in the CBC, were made as to how much square footage a person may occupy in a given building (see Table D-1). Once this was determined, the following equation was applied to determine the FAR for a given nonresidential use:

$$\text{FAR} = \frac{\text{(allowable usage intensity) x (occupancy load factor)}}{\text{43,560 sq. feet per acre}}$$

In this equation, *usage intensity* is understood in terms of people per acre, and *occupancy load factor* as square feet per person. The guideline for determining usage intensity numbers is found in the *Handbook* (see Appendix C), and the occupancy levels were provided in the CBC (see Table D-2). The FAR limits were calculated from these two numbers using the formula above.

EXHIBIT D-1

Example 1

Proposed Development: Two office buildings, each two stories and containing 20,000 square feet of floor area per building. Site size is 3.0 net acres. Counting a portion of the adjacent road, the gross area of the site is 3.5± acres.

A. *Calculation Based on Parking Space Requirements*

For office uses, assume that a county or city parking ordinance requires 1 parking space for every 300 square feet of floor area. Data from traffic studies or other sources can be used to estimate the average vehicle occupancy. For the purposes of this example, the number of people on the property is assumed to equal 1.5 times the number of parking spaces.

The average usage intensity would therefore be calculated as follows:

1) 40,000 sq. ft. floor area x 1.0 parking space per 300 sq. ft. = 134 required parking spaces
2) 134 parking spaces x 1.5 people per space = 200 people maximum on site
3) 200 people ÷ 3.5 acres gross site size = 57 people per acre average for the site

Assuming that occupancy of each building is relatively equal throughout, but that there is some separation between the buildings and outdoor uses are minimal, the usage intensity for a single acre would be estimated to be:

1) 20,000 sq. ft. bldg. ÷ 2 stories = 10,000 sq. ft. bldg. footprint
2) 10,000 sq. ft. bldg. footprint ÷ 43,560 sq. ft. per acre = 0.23 acre bldg. footprint
3) Building footprint < 1.0 acre; therefore maximum people in 1 acre = bldg. occupancy = 100 people per single acre

B. *Calculation Based on Uniform Building Code*

Using the UBC (Appendix C1) as the basis for estimating building occupancy yields the following results for the above example:

1) 40,000 sq. ft. bldg. ÷ 100 sq. ft./occupant = 400 people max. bldg. occupancy (under UBC)
2) 400 max. bldg. occupancy x 50% adjustment = 200 people maximum on site
3) 200 people ÷ 3.5 acres gross site size = 57 people per acre average for the site

Conclusions: In this instance, both methodologies give the same results. For different uses and/or different assumptions, the two methodologies are likely to produce different numbers. In most such cases, the UBC methodology will indicate a higher intensity.

EXHIBIT D-1 CONT.

Example 2

Proposed Development: Single-floor furniture store containing 24,000 square feet of floor area on a site of 1.7 net acres. Counting a portion of the adjacent road, the gross area of the site is 2.0 acres).

A. Calculation Based on Parking Space Requirements

For furniture stores, the county requires 1 parking space per 400 square feet of use area. Assuming 1.5 people per automobile, the average usage intensity would be:

1) 24,000 sq. ft. bldg. x 1.0 parking space per 400 sq. ft. = 60 required parking spaces
2) 60 parking spaces x 1.5 people per space = 90 people maximum on site
3) 90 people ÷ 1.26 acres gross site size = 72 people per acre average for the site

Again assuming a relatively balanced occupancy throughout the building and that outdoor uses are mini mal, the usage intensity for a single acre would be estimated to be:

1) 24,000 sq. ft. bldg. footprint ÷ 43,560 sq. ft. per acre = 0.55 acre bldg. footprint
3) Building footprint < 1.0 acre; therefore maximum people in 1 acre = bldg. occupancy = 90 people per single acre

B. Calculation Based on Uniform Building Code

For the purposes of the UBC-based methodology, the furniture store is assumed to be consist of 50% retail sales floor (at 30 square feet per occupant) and 50% warehouse (at 500 square feet per occupant). Usage intensities would therefore be estimated as follows:

1) 12,000 sq. ft. retail floor area ÷ 30 sq. ft./occupant = 400 people max. occupancy in retail area
2) 12,000 sq. ft. warehouse floor area ÷ 500 sq. ft./occupant = 24 people max. occupancy in warehouse area
3) Maximum occupancy under UBC assumptions = 400 + 24 = 424 people
4) Assuming typical peak occupancy is 50% of UBC numbers = 212 people maximum expected at any one time
5) 212 people ÷ 1.26 acres = 168 people per acre average for the site

With respect to the single-acre intensity criteria, the entire building occupancy would again be within less than 1.0 acre, thus yielding the same intensity of 168 people per single acre.

Conclusions: In this instance, the two methods produce very different results. The occupancy estimate of 30 square feet per person is undoubtedly low for a furniture store even after the 50% adjustment. The 72 people-per-acre estimate using the parking requirement methodology is probably closer to being realistic. As part of the general plan consistency process, ALUCs and local jurisdictions should decide which method or combination of methods is to be used in reviewing development proposals.

Source: Caltrans, California Airport Land Use Planning Handbook, January 2002.

TABLE D-1
OCCUPANCY LEVELS – CALIFORNIA BUILDING CODE

Use	Minimum Square Feet per Occupant
1. Aircraft Hangars (no repair)	500
2. Auction Rooms	7
3. Assembly Areas, Concentrated Use Without Fixed Seats (auditoriums, churches, dance floors, lobby accessory to assembly occupancy, lodge rooms, reviewing stands, stadiums, waiting areas)	7
4. Assembly Areas, Less Concentrated Use (conference rooms, dining rooms, drinking establishments, exhibit rooms, gymnasiums, lounges, stages)	15
Gaming	11
5. Bowling Alley (assume no occupant load for bowling lanes)	4
6. Children's Homes and Homes for the Aged	80
7. Classrooms	20
8. Congregate Residences	200
9. Courtrooms	40
10. Dormitories	50
11. Dwellings	300
12. Exercising Rooms	50
13. Garage, Parking	200
14. Health-Care Facilities	80
Sleeping Rooms	120
Treatment Rooms	240
15. Hotels and Apartments	200
16. Kitchen - Commercial	200
17. Library Reading Room	50
Stack Areas	100
18. Locker Rooms	50
19. Malls	Varies
20. Manufacturing Areas	200
21. Mechanical Equipment Room	300
22. Nurseries for Children (Daycare)	35
23. Offices	100
24. School Shops and Vocational Rooms	50
25. Skating Rinks	50 on the skating area; 15 on the deck
26. Storage and Stock Rooms	300
27. Stores - Retail Sales Rooms	
Basements and Ground Floors	30
Upper Floors	60
28. Swimming Pools	50 for the pool area; 15 on the deck
29. Warehouses	500
30. All Others	100

Source: *California Building Code* (2001), Table 10-A.

TABLE D-2
OCCUPANCY TYPES – CALIFORNIA BUILDING CODE

Group and Division	CBC Section	Description of Occupancy
A-1	303.1.1	A building or portion of a building having an assembly room with an occupant load of 1,000 or more and a legitimate stage.
A-2		A building or portion of a building having an assembly room with an occupant load of less than 1,000 and a legitimate stage.
A-2.1		A building or portion of a building having an assembly room with an occupant load of 300 or more without a legitimate stage, including such buildings used for educational purposes and not classed as a Group E or Group B Occupancy.
A-3		A building or portion of a building having an assembly room with an occupant load of less than 300 without a legitimate stage, including such buildings used for educational purposes and not classed as a Group E or Group B Occupancy.
A-4		Stadiums, reviewing stands and amusement park structures not included within other Group A Occupancies.
B	304.1	A building or structure, or a portion thereof, for office, professional, or service-type transactions, including storage of records and accounts; eating establishments and drinking establishments with an occupant load of less than 50.
E-1	305.1	Any building used for educational purposes through the 12th grade by 50 or more persons for more than 12 hours per week or four hours in any one day.
E-2		Any building used for educational purposes through the 12th grade by less than 50 persons for more than 12 hours per week or four hours in any one day.
E-3		Any building or portion thereof used for day-care purposes for more than six persons.
F-1	306.1	Moderate-hazard factory and industrial occupancies include factory and industrial uses not classified in as Group F, Division 2 Occupancies.
F-2		Low-hazard factory and industrial occupancies include facilities producing noncombustible or nonexplosive materials that during finishing, packing or processing do not involve a significant fire hazard.
H-1	307.1	Occupancies with a quantity of material in the building in excess of those listed in Table 3-D that present a high explosion hazard as listed in Section 307.1.1.
H-2		Occupancies with a quantity of material in the building in excess of those listed in Table 3-D that present a moderate explosion hazard as listed in Section 307.1.1.
H-3		Occupancies with a quantity of material in the building in excess of those listed in Table 3-D that present a high fire or physical hazard as listed in Section 307.1.1.
H-4		Repair garages not classified as Group S, Division 3 Occupancies.
H-5		Aircraft repair hangars not classified as Group S, Division 5 Occupancies and heliports.
H-6	307.1 and 307.11	Semiconductor fabrication facilities and comparable research and development areas when the facilities in which the hazardous production materials are used, and the aggregate quantity of the material is in excess of those listed in Table 3-D or 3-E.
H-7	307.1	Occupancies having quantities of materials in excess of those listed in Table 3-E that are health hazards as listed in Section 307.1.1.
I-1.1	308.1	Nurseries for the full-time care of children under the age of six (each accommodating more than five children), hospitals, sanitariums, nursing homes with nonambulatory patients and similar buildings (each accommodating more than 5 patients [*for SFM*] six patients or children).
I-1.2		Health-care centers for ambulatory patients receiving outpatient medical care which may render the patient incapable of unassisted self-preservation (each tenant space accommodating more than five such patients).
I-2		Nursing homes for ambulatory patients, homes for children six years of age or older (each accommodating more than five persons [*for SMF*] six patients or children).
I-3		Mental hospitals, mental sanitariums, jails, prisons, reformatories and buildings where personal liberties of inmates are similarly restrained.
M	309.1	A building or structure, or a portion thereof, for the display and sale of merchandise, and involving stocks of goods, wares or merchandise, incidental to such purposes and accessible to the public.
R-1	310.1	Hotels and apartment houses, congregate residences (each accommodating more than 10 persons).
R-2.1		*Residential care facilities for the elderly (each accommodating more than six nonambulatory clients).*
R-2.2		*Residential care facilities for the elderly (each accommodating more than six ambulatory clients).*
R-2.1.1		*Residential care facilities for the elderly (each accommodating six or less nonambulatory clients).*
R-2.2.1		*Residential care facilities for the elderly (each accommodating six or less ambulatory clients).*
R-2.3		*Residential-based licensed facilities providing hospice care throughout, accommodating more than six bedridden clients.*
R-2.3.1		*Residential-based licensed facilities providing hospice care throughout, accommodating six or less bedridden clients.*
R-3		Dwellings, lodging houses, congregate residences (each accommodating 10 or fewer persons).
S-1	311.1	Moderate-hazard storage occupancies including buildings or portions of buildings used for storage of combustible materials not classified as Group S, Division 2 or Group H Occupancies.
S-2		Low-hazard storage occupancies including buildings or portions of buildings used for storage of noncombustible materials.
S-3		Repair garages where work is limited to exchange of parts and maintenance not requiring open flame or welding, and parking garages not classified as Group S, Division 4 Occupancies.
S-4		Open parking garages.
S-5		Aircraft hangars and helistops.
U-1	312.1	Private garages, carports, sheds and agricultural buildings.
U-2		Fences over 6 feet (1829 mm) high, tanks and towers.

Source: *California Building Code* (2001), Table 3-A

Appendix E
Sample Implementation Documents

APPENDIX E
Sample Implementation Documents

The responsibility for implementation of the policies set forth in the compatibility plans adopted by airport land use commissions rests largely with the affected local jurisdictions. Implementation tools fall into the categories of notification and regulation. The state requires certain notification requirements effective January 1, 2004 (as a result of Assembly Bill 2776). Additional notification, in the form of a recorded deed notice, may also be appropriate. Regulation may take the form of individual property restrictions (avigation easements) or additional development controls in areas within the vicinity of an airport (an airport combining zone ordinance).

Required Notification—State law requires any person who intends to offer subdivided lands within California for sale or lease to file with the Department of Real Estate an application for a public report consisting of a notice of intention and a completed questionnaire. The notice shall include, for property within an AIA to include the following notice:

> NOTICE OF AIRPORT IN VICINITY
>
> This property is presently located in the vicinity of an airport, within what is known as an airport influence area. For that reason, the property may be subject to some of the annoyances or inconveniences associated with proximity to airport operations (for example: noise, vibration, or odors). Individual sensitivities to those annoyances can vary from person to person. You may wish to consider what airport annoyances, if any, are associated with the property before you complete your purchase and determine whether they are acceptable to you.

Recorded Deed Notice—Deed notices are a form of buyer awareness measure whose objective is to ensure that prospective buyers of airport area property, particularly residential property, are informed about the airport's impact on the property. Unlike easements, deed notices do not convey property rights from the property owner to the airport and do not restrict the height of objects. They only document the existence of certain conditions which affect the property—such as the proximity of the airport and common occurrence of aircraft overflights at or below the airport traffic pattern altitude. ALUCs may make recording of deed notices a requirement for project approval within portions of the airport influence area where avigation easements are not essential. Included in this Appendix is sample of a deed notice (from the California Airport Land Use Planning Handbook, 2002).

Avigation Easement—Avigation easements transfer certain property rights from the owner of the underlying property to the owner of an airport. ALUCs may require avigation easement dedication as a condition for approval of development on property subject to high noise levels or a need to restrict heights of structures and trees to less than what might ordinarily occur on the property. Also, airports may require avigation easements in conjunction with programs for noise insulation of existing structures in the airport vicinity. Included in this Appendix is a sample avigation easement (from the California Airport Land Use Planning Handbook, 2002).

Airport Combining Zone Ordinance—An additional type of implementation document available to local jurisdictions is an airport combining zone ordinance. Possible components for such an ordinance are described in Table E-1.

TABLE E-1
POSSIBLE AIRPORT COMBINING ZONE COMPONENTS

An airport compatibility combining zoning ordinance might include some or all of the following components:

- **Airspace Protection**—A combining district can establish restrictions on the height of buildings, antennas, trees, and other objects as necessary to protect the airspace needed for operation of the airport. These restrictions should be based upon the current version of Federal Aviation Regulations (FAR) Part 77, Objects Affecting Navigable Airspace, Subpart C. Additions or adjustment to take into account instrument approach (TERPS) surfaces should be made as necessary. Provisions prohibiting smoke, glare, bird attractions, and other hazards to flight should also be included.

- **FAA Notification Requirements**—Combining districts also can be used to ensure that project developers are informed about the need for compliance with the notification requirements of FAR Part 77. Subpart B of the regulations requires that the proponent of any project which exceeds a specified set of height criteria submit a Notice of Proposed Construction or Alteration (Form 7460-1) to the Federal Aviation Administration prior to commencement of construction. The height criteria associated with this notification requirement are lower than those spelled out in Part 77, Subpart C, which define airspace obstructions. The purpose of the notification is to determine if the proposed construction would constitute a potential hazard or obstruction to flight. Notification is not required for proposed structures that would be shielded by existing structures or by natural terrain of equal or greater height, where it is obvious that the proposal would not adversely affect air safety.

- **Maximum Densities/Intensities**—Airport noise and safety compatibility criteria are frequently expressed in terms of dwelling units per acre for residential uses and people per acre for other land uses. These standards can either be directly included in a combining zone or used to modify the underlying land use designations. For residential land uses, the correlation between the compatibility criteria and land use designations is direct. For other land uses, the method of calculating the intensity limitations needs to be defined. Alternatively, a matrix can be established indicating whether each specific type of land use is compatible with each compatibility zone. To be useful, the land use categories need to be more detailed than typically provided by general plan or zoning ordinance land use designations.

- **Open Areas for Emergency Landing of Aircraft**—In most circumstances in which an accident involving a small aircraft occurs near an airport, the aircraft is under control as it descends. When forced to make an off-airport emergency landing, pilots will usually attempt to do so in the most open area readily available. To enhance safety both for people on the ground and the occupants of aircraft, airport compatibility plans often contain criteria requiring a certain amount of open land near airports. These criteria are most effectively carried out by planning at the general or specific plan level, but may also need to be included in a combining district so that they will be applied to development of large parcels. Adequate open areas can often be provided by clustering of development on adjacent land.

TABLE E-1
POSSIBLE AIRPORT COMBINING ZONE COMPONENTS

An airport compatibility combining zoning ordinance might include some or all of the following components:

- **State Regulation of Obstructions**—State law prohibits anyone from constructing or altering a structure or permitting an object of natural growth to exceed the heights established by FAR Part 77, Subpart C, unless the FAA has determined the object would not or does not constitute a hazard to air navigation (Public Utilities Code, Section 21659). Additionally, a permit from the Department of Transportation is required for any structure taller than 500 feet above the ground unless the height is reviewed and approved by the Federal Communications Commission or the FAA (Section 21656).
- **Designation of High Noise-Impact Areas**—California state statutes require that multi-family residential structures in high-noise exposure areas be constructed so as to limit the interior noise to a Community Noise Equivalent Level of no more than 45 dB. A combining district could be used to indicate the locations where special construction techniques may be necessary in order to ensure compliance with this requirement. The combining district also could extend this criterion to single-family dwellings.
- **Areas of Special Compatibility Concern**—A significant drawback of standard general plan and zoning ordinance land use designations is that they can be changed. Uses that are currently compatible are not assured of staying that way in the future. Designation of areas of special compatibility concern would serve as a reminder that airport impacts should be carefully considered in any decision to change the existing land use designation. [A legal consideration which supports the value of this concept is that down-zoning of a property to a less intensive use is becoming more difficult. It is much better not to have inappropriately up-zoned the property in the first place.]
- **Real Estate Disclosure Policies**—The geographic extent and specific language of recommended real estate disclosure statements can be described in an airport combining zone ordinance.

Sample Avigation Easement

This indenture made this _____ day of _____, 20___, between_____ herein after referred to as Grantor, and the [Insert County or City name], a political subdivision in the State of California, hereinafter referred to as Grantee. The Grantor, for good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, does hereby grant to the Grantee, its successors and assigns, a perpetual and assignable easement over the following described parcel of land in which the Grantor holds a fee simple estate. The property which is subject to this easement is depicted as _____ on "Exhibit A" attached and is more particularly described as follows:

[Insert legal description of real property] The easement applies to the Airspace above an imaginary plane over the real property. The plane is described as follows:

The imaginary plane above the hereinbefore described real property, as such plane is defined by Part 77 of the Federal Aviation Regulations, and consists of a plane [describe approach, transition, or horizontal surface]; the elevation of said plane being based upon the _____ Airport official runway end elevation of _____ feet Above Mean Sea Level (AMSL), as determined by [Insert name and Date of Survey or Airport Layout Plan that determines the elevation] the approximate dimensions of which said plane are described and shown on Exhibit A attached hereto and incorporated herein by reference.

The aforesaid easement and right-of-way includes, but is not limited to:

1) For the use and benefit of the public, the easement and continuing right to fly, or cause or permit the flight by any and all persons, or any aircraft, of any and all kinds now or hereafter known, in, through, across, or about any portion of the Airspace hereinabove described; and

2) The easement and right to cause or create, or permit or allow to be caused or created within all space above the existing surface of the hereinabove described real property and any and all Airspace laterally adjacent to said real property, such noise, vibration, currents and other effects of air, illumination, and fuel consumption as may be inherent in, or may arise or occur from or during the operation of aircraft of any and all kinds, now or hereafter known or used, for navigation of or flight in air; and

3) A continuing right to clear and keep clear from the Airspace any portions of buildings, structures, or improvements of any kinds, and of trees or other objects, including the right to remove or demolish those portions of such buildings, structures, improvements, trees, or other things which extend into or above said Airspace, and the right to cut to the ground level and remove, any trees which extend into or above the Airspace; and

4) The right to mark and light, or cause or require to be marked or lighted, as obstructions to air navigation, any and all buildings, structures, or other improvements, and trees or other objects, which extend into or above the Airspace; and

5) The right of ingress to, passage within, and egress from the hereinabove described real property, for the purposes described in subparagraphs (3) and (4) above at reasonable times and after reasonable notice.

For and on behalf of itself, its successors and assigns, the Grantor hereby covenants with the [Insert County or City name], for the direct benefit of the real property constituting the _____ Airport hereinafter described, that neither the Grantor, nor its successors in interest or assigns will construct, install, erect, place or grow in or upon the hereinabove described real property, nor will they permit to allow, any building structure, improvement, tree or other object which extends into or above the Airspace, or which constitutes an obstruction to air navigation, or which obstructs or interferes with the use of the easement and rights-of-way herein granted.

The easements and rights-of-way herein granted shall be deemed both appurtenant to and for the direct benefit of that real property which constitutes the _____ Airport, in the [Insert County or City name], State of California; and shall further be deemed in gross, being conveyed to the Grantee for the benefit of the Grantee and any and all members of the general public who may use said easement or right-of-way, in landing at, taking off from or operating such aircraft in or about the _____ Airport, or in otherwise flying through said Airspace.

Grantor, together with its successors in interest and assigns, hereby waives its right to legal action against Grantee, its successors, or assigns for monetary damages or other redress due to impacts, as described in Paragraph (2) of the granted rights of easement, associated with aircraft operations in

the air or on the ground at the airport, including future increases in the volume or changes in location of said operations. Furthermore, Grantor, its successors, and assigns shall have no duty to avoid or mitigate such damages through physical modification of airport facilities or establishment or modification of aircraft operational procedures or restrictions. However, this waiver shall not apply if the airport role or character of its usage (as identified in an adopted airport master plan, for example) changes in a fundamental manner which could not reasonably have been anticipated at the time of the granting of this easement and which results in a substantial increase in the impacts associated with aircraft operations. Also, this grant of easement shall not operate to deprive the Grantor, its successors or assigns, of any rights which may from time to time have against any air carrier or private operator for negligent or unlawful operation of aircraft.

These covenants and agreements run with the land and are binding upon the heirs, administrators, executors, successors and assigns of the Grantor, and, for the purpose of this instrument, the real property firstly hereinabove described is the servient tenement and said _____ Airport is the dominant tenement.

DATED: _____
STATE OF:
COUNTY OF:

On _____, before me, the undersigned, a Notary Public in and for said County and State, personally appeared _____, and _____ known to me to be the persons whose names are subscribed to the within instrument and acknowledged that they executed the same.

WITNESS my hand and official seal.

_____
Notary Public

Sample Deed Notice

A statement similar to the following should be included on the deed for any real property subject to the deed notice requirements set forth in the [Insert ALUC name] *Airport Land Use Compatibility Plan*. Such notice should be recorded by the county of [Insert County name]. Also, this deed notice should be included on any parcel map, tentative map, or final map for subdivision approval.

The *Alameda County Airport Land Use Compatibility Plan* and [Insert County/City name] Ordinance (Ordinance No. _____) identify a [Insert Airport name] Airport Influence Area. Properties within this area are routinely subject to overflights by aircraft using this public-use airport and, as a result, residents may experience inconvenience, annoyance, or discomfort arising from the noise of such operations. State law (Public Utilities Code Section 21670 et seq.)

establishes the importance of public-use airports to protection of the public interest of the people of the state of California. Residents of property near such airports should therefore be prepared to accept the inconvenience, annoyance, or discomfort from normal aircraft operations. Residents also should be aware that the current volume of aircraft activity may increase in the future in response to Alameda County population and economic growth. Any subsequent deed conveying this parcel or subdivisions thereof shall contain a statement in substantially this form.

Appendix F
Consistency Checklist

APPENDIX F
Consistency Checklist

Introduction

One of the fundamental responsibilities assigned to ALUCs by the Aeronautics Act is to review particular types of local actions for compliance with the criteria and policies set forth in the commissions' adopted compatibility plans. The law specifies that local jurisdictions must refer certain actions to the ALUC for review. Actions included in this category are proposed adoption or amendment of general plans, specific plans, zoning ordinances, and building regulations affecting land within an AIA. Also required to be submitted for ALUC review are several types of airport and heliport development plans. Referral of other local actions – primarily individual development projects – is required in some instances, but voluntary in others.

The following checklist is intended to assist local jurisdictions with modifications necessary to make their general plans and other local policies consistent with the ALUC's compatibility plan. It is also designed to facilitate ALUC reviews of these local plans and policies. For more information on the review process of local land use actions, please refer to chapters 4 and 5 of the *California Airport Land Use Planning Handbook* (Caltrans, 2002).

Consistency Checklist

General and Specific Plan Documents

The following items typically appear directly in a general or specific plan. Amendment of these types of documents will be required if there are any conflicts with the ALUCP.

Land Use Map – No direct conflicts should exist between proposed new land uses indicated on a general plan land use map and the ALUC land use compatibility criteria.

- □ Residential densities (dwelling units per acre) should not exceed the set limits. Differences between gross and net densities and the potential for secondary dwellings on single parcels may need to be taken into account.
- □ Proposed nonresidential development needs to be assessed with respect to applicable intensity limits.
- □ No new land uses of a type listed as specifically prohibited should be shown within affected areas.

Noise Element – General plan noise elements typically include criteria indicating the maximum noise exposure for which residential development is normally acceptable. Note, however, that a general plan may establish a different limit with respect to aviation-related noise than for noise from other sources (this may be appropriate in that aviation-related noise is often judged to be more objectionable than other types of equally loud noises).

- □ This limit must be made consistent with the equivalent compatibility plan criteria.

Zoning or Other Policy Documents

The following items need to be reflected either in the general plan or in a separate policy document such as a combining zone ordinance. If a separate policy document is adopted, modification of the general plan to achieve consistency with the compatibility plan may not be required. Modifications would normally be needed only to eliminate any conflicting language which may be present and to make reference to the separate policy document.

- □ **Secondary Dwellings** – detached secondary dwellings on the same parcel should be counted as additional dwellings for the purposes of density calculations. This factor needs to be reflected in local policies either by adjusting the maximum allowable densities or by prohibiting secondary dwellings where their presence would conflict with the compatibility criteria.
- □ **Intensity Limitations on Nonresidential Uses** – Local policies must be established to limit the usage intensities of commercial, industrial, and other nonresidential land uses. This can be done by duplication of the performance-oriented criteria – specifically, the number of people per acre – indicated in the compatibility plan. Alternatively, local jurisdictions may create a detailed list of land uses which are allowable and/or not allowable within each compatibility zone. For certain land uses, such a list may need to

include limits on building sizes, floor area ratios, habitable floors, and/or other design parameters which are equivalent to the usage intensity criteria.

- □ **Identification of Prohibited Uses** – Compatibility plans may prohibit day care centers, hospitals, and certain other uses within much of an airport's influence area. The facilities often are permitted or conditionally permitted uses within many commercial or industrial land use designations. Policies need to be established which preclude these uses in accordance with the compatibility criteria.
- □ **Open Land Requirements** – Compatibility plan requirements, if any, for assuring that a minimum amount of open land is preserved in the airport vicinity must be reflected in local policies. Normally, the locations which are intended to be maintained as open land would be identified on a map with the total acreage within each compatibility zone indicated. If some of the area included as open land is private property, then policies must be established which assure that the open land will continue to exist as the property develops. Policies specifying the required characteristics of eligible open land also must be established.
- □ **Infill development** – If a compatibility plan contains infill policies and a jurisdiction wishes to take advantage of them, the lands which meet the qualifications must be shown on a map.
- □ **Height Limitations and Other Hazards to Flight** – To protect the airport airspace, limitations must be set on the height of structures and other objects near airports. These limitations are to be based upon Part 77 of the Federal Aviation Regulations, but may include exceptions for objects on high terrain if provided for in the ALUCP. Restrictions also must be established on other land use characteristics which can cause hazards to flight (specifically, visual or electronic interference with navigation and uses which attracted hazardous wildlife). Note that many jurisdictions have already adopted an airport-related hazard and height limit zoning ordinance which, if up to date, will satisfy this consistency requirement.
- □ **Noise Insulation Requirements** – Some compatibility plans call for certain buildings proposed for construction within high noise-impact areas to demonstrate that they will contain sufficient sound insulation to reduce aircraft-related noise to an acceptable level. These criteria apply to new residences, schools, and certain other buildings containing noise-sensitive uses. Local policies must include parallel criteria.
- □ **Buyer Awareness Measures** – As a condition for approval of development within certain compatibility zones, some compatibility plans require either dedication of an avigation easement to the airport proprietor or place on deeds of a notice regarding airport impacts. If so, local jurisdiction policies must contain similar requirements. Compatibility plans also may encourage, but should not require, local jurisdictions to adopt a policy stating that airport proximity and the potential for aircraft overflights be disclosed as part of real estate transactions regarding property in the airport influence area.

- **Nonconforming Uses and Reconstruction** – Local jurisdiction policies regarding nonconforming uses and reconstruction must be equivalent to or more restrictive than those in the ALUCP, if any.

Review Procedures

In addition to incorporation of ALUC compatibility criteria, local jurisdiction implementing documents must specify the manner in which development proposals will be reviewed for consistency with the compatibility criteria.

- **Actions Always Required to be Submitted for ALUC Review** – State law specifies which types of development actions must be submitted for ALUC review. Local policies should either list these actions or, at a minimum, not the jurisdiction's intent to comply with the state statute.
- **Other Land Use Actions Potentially Subject to ALUC Review** – In addition to the above actions, the compatibility plan may identify certain major land use actions for which referral to the ALUC is dependent upon agreement between the jurisdiction and the ALUC. If the jurisdiction fully complies with all of the items in this general plan consistency checklist or has taken the necessary steps to overrule the ALUC, then referral of the additional actions is voluntary. On the other hand, a jurisdiction may elect not to incorporate all of the necessary compatibility criteria and review procedures into its own policies. In this case, referral of major land use actions to the ALUC is mandatory. Local policies should indicate the jurisdiction's intentions in this regard.
- **Process for Compatibility Reviews by Local Jurisdictions** – If a jurisdiction choose to submit only the mandatory actions for ALUC review, then it must establish a policy indicating the procedures which will be used to assure that airport compatibility criteria are addressed during review of other projects. Possibilities include: a standard review procedure checklist which includes reference to compatibility criteria; use of a geographic information system to identify all parcels within the airport influence area; etc.
- **Variance Procedures** – Local procedures for granting of variances to the zoning ordinance must make certain that any such variances do not result in a conflict with the compatibility criteria. Any variance which involves issues of noise, safety, airspace protection, or overflight compatibility as addressed in the compatibility plan must be referred to the ALUC for review.
- **Enforcement** – Policies must be established to assure compliance with compatibility criteria during the lifetime of the development. Enforcement procedures are especially necessary with regard to limitations on usage intensities and the heights of objects. An airport combining district zoning ordinance is one means of implementing enforcement requirements.

Appendix G
Heliport Design

ESA

APPENDIX G
Heliport Design

As described in Table 2-1 "Heliports in Alameda County", one public- and several private-use airports operate to support private, business, and medical uses. Proposals to enhance, modify, or deactivate these facilities is subject to ALUC review.

FAA Advisory Circular (AC) 150/5390-2B, "Heliport Design," provides recommendations for heliport design and describes the federal requirements associated with heliport development. The AC applies to any proposal to construct, activate, or deactivate a heliport. Although the AC only constitutes a regulation when Federal funds are used, Alameda County encourages those with heliport proposals to implement the guidance set forth in the AC to the greatest extent practicable.

FAA AC 150/5390-2B provides detailed data concerning heliport and helipad design, such as:

- Physical, technical, and public interest matters that should be considered in the planning and establishment of a heliport;
- Descriptions pertaining to appropriate or optimum locations for heliports;
- Terminology and pertinent terms associated with heliports;
- Design standards relevant to developing heliport facilities that support general aviation, transport, and hospitals, including diagrams;
- Gradient and pavement design; and
- Dimensional data, markings, etc.

FAA recommends that the standards presented in the AC should be used in planning and designing improvements to existing facilities or whenever a significant expansion or reconstruction project is undertaken. The complete AC is available at www.faa.gov in several files that can be downloaded upon request. The cover memorandum describing the AC and the Table of Contents are reproduced here for convenience, as the AC comprises more than 200 pages and is likely to be revised during the lifetime of this Airport Land Use Compatibility Plan. The most recent version of the AC is available from the FAA website at: www.faa.gov.

U.S. Department
of Transportation

Federal Aviation
Administration

Advisory Circular

Subject: HELIPORT DESIGN | Date: 09/30/04 | AC No: 150/5390-2B
Initiated by: AAS-100 | Change:

1. PURPOSE. This advisory circular (AC) provides recommendations for heliport design and describes acceptable requirements to develop a heliport. This AC applies to anyone who is proposing to construct, activate or deactivate a heliport.

2. APPLICABILITY: This AC is not mandatory and does not constitute a regulation except when Federal funds are specifically dedicated for heliport construction.

3. EFFECTIVE DATE:

4. CANCELLATION. AC 150/5390-2A, *Heliport Design*, dated January 20, 1994, is canceled.

5. EXECUTIVE SUMMARY. The modern helicopter is one of the most versatile transportation vehicles known to man. Typically, a heliport is substantially smaller than an airport providing comparable services. The helicopter has the capability of providing a wide variety of important services to any community that integrates this aircraft into its local transportation system.

a. Service. In addition to their service in the transportation of people, helicopters have proven to be useful to their communities in the following ways:

(1). Disaster Relief. Natural disasters often result in the breakdown of ground transportation systems. Helicopters are able both to bring in response teams and supplies and to evacuate injured people during the critical period before ground transportation is restored.

(2). Air Ambulance Services. For an injured or critically ill person, time is life. Helicopters can provide high-speed, point-to-point transportation without being constrained by the limitations of the ground infrastructure.

(3). Police Services. Many municipalities consider their police services helicopters vital force multipliers in carrying out search and rescue, chase, and surveillance.

(4). Moving High-Value Assets. High-value or time-sensitive cargo, such as canceled checks, and people, including the President of the United States, frequently travel on helicopters because this mode of transportation is fast and flexible. Companies use helicopters as an invaluable part of an in-house transportation system to connect the office with various plants, job sites, and the local airport. Utility companies use helicopters to construct and inspect high-voltage electrical lines and to monitor underground gas transmission lines. The petroleum industry uses helicopters to support exploration and production operations. Newspapers and radio/TV stations use helicopters for onsite news gathering, taking photos, and airborne reporting of rush hour traffic conditions.

b. Facilities. The most effective way for a community to realize the benefits of helicopter services is by developing or permitting the development of places where helicopters can land and take off. While heliports can be large and elaborate, most are not. The basic elements of a heliport are clear approach/ departure paths, a clear area

for ground maneuvers, and a windsock. This minimal facility may be adequate as a private use heliport, and may even suffice as the initial phase in the development of a public use heliport capable of serving the general aviation segment of the helicopter community.

c. Planning. While the heliport itself may be simple, the planning and organization required to properly put one into place can be intimidating. To help make the process easier, the Federal Aviation Administration (FAA) has published this AC. This document describes physical, technical, and public interest matters that should be considered in the planning and establishment of a heliport. While this AC is a technical document intended to help engineers, architects, and city planners' design, locate, and build the most effective heliport, it can be used by anyone considering the construction of a heliport.

d. Location. The optimum location for a heliport is in close proximity to the desired origination and/or destination of the potential users. Industrial, commercial, and business operations in urban locations are demand generators for helicopter services, even though they often compete for the limited ground space available. A site permitting the shared aeronautical and commercial usage is a viable alternative to non-aeronautical use alone. Heliport sites may be adjacent to a river or a lake, a railroad, a freeway, or a highway, all of which offer the potential for multi- functional land usage. These locations also have the advantage of relatively unobstructed airspace, which can be further protected from unwanted encroachment by properly enacted zoning. As vertical flight transportation becomes more prevalent, requirements for scheduled "airline type" passenger services will necessitate the development of an instrument procedure to permit "all-weather" service.

e. AC Organization. This AC is structured to provide communities and persons intending to develop a heliport, or become involved in regulating helicopter facilities, with general guidance on heliport requirements. The AC is organized with separate chapters covering general aviation heliports, transport heliports, and hospital heliports based on the functional role of the heliport.

(1). A heliport proponent should be familiar with the terminology used in this specialized field. Chapter 1 defines pertinent terms used in the industry and identifies actions common to developing a heliport.

(2). General aviation heliports are normally privately owned although they can be publicly owned. Design standards relevant to developing a general aviation heliport are found in Chapter 2.

(3). Transport heliports are developed to provide the community with a full range of vertical flight services including scheduled service by air carriers (airlines) using helicopters. When the heliport serves any scheduled or unscheduled passenger operation of an air carrier that is conducted with an aircraft having a seating capacity of more than 30 passengers, the heliport is required to be certificated by the FAA in accordance with 14 Code of Federal Regulations (CFR) Part 139, Certification and Operations: Land Airports Serving Certain Air Carriers. In any event, a transport heliport would also accommodate corporate users and local air taxi operators. This broad spectrum of activities frequently requires a more extensive airside and landside infrastructure with the potential capability to operate in instrument meteorological conditions. Not withstanding these requirements, a community's investment in a heliport may be substantially less than the investment required for an airport providing comparable services. Design standards relevant to developing a transport heliport are found in Chapter 3.

(4). Hospital heliports are treated as special cases of general aviation facilities providing a unique public service. They are normally located in close proximity to the hospital emergency room or a medical facility. Design recommendations relevant to developing a hospital heliport are found in Chapter 4.

(5). When there are a significant number of helicopter operations on an airport, it may be prudent to consider developing separate facilities specifically for helicopter use. Chapter 5 addresses helicopter facilities on airports.

(6). With the introduction of the global positioning system (GPS), it is now practical for heliports to have instrument approaches. Good planning suggests that heliport proponents should plan for the eventual development of instrument approaches to their heliports. Chapters 6 and 7 contain recommendations to be considered in contemplating future instrument operations at a heliport. It is wise to consider these issues during site selection and design.

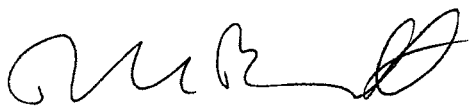
(7). Chapter 8 addresses heliport gradients and pavement design issues.

(8). The appendices provide helicopter dimensional data, addresses of aviation organizations, form and proportions of certain heliport markings, and acronyms.

6. APPLICATION. The recommendations and standards in this AC are for planning and designing civil heliports. To the extent that it is feasible and practical to do so, the standards in this AC should be used in planning and designing improvements to an existing facility when significant expansion or reconstruction is undertaken. Conformity with these standards is a prerequisite to Federal grant-in-aid assistance. Modification to a heliport design standard related to new construction, expansion, reconstruction, or upgrade on a heliport that received Federal aid requires FAA approval. The request for modification should show that the modification will provide an acceptable level of safety, economy, durability, and workmanship. The recommendations and standards in this AC are not intended to be sufficient to design an instrument approach procedure.

NOTE: *If tiltrotor operations are contemplated, criteria in AC 150/5390-3, Vertiport Design are applicable.*

7. METRIC UNITS. To promote an orderly transition to metric units, this AC includes both English and metric dimensions. The metric conversions may not be exact equivalents, and until there is an official changeover to the metric system, the English dimensions will govern.



DAVID L. BENNETT
Director of Airport Safety and Standards

TABLE OF CONTENTS

Paragraph **Page**

LIST OF FIGURES

LIST OF TABLES

Appendix H
Glossary

APPENDIX H
Glossary

Air carrier: An operator that:

1. performs at least five round trips per week between two or more points and publishes flight schedules which specify the times, days of the week and places between which such flights are performed; or

2. transport mail by air pursuant to a current contract with the United States Postal Service.

Air carriers are certified in accordance with Federal Aviation Regulations (FAR) Parts 121 and 127.

Air charter: An air carrier certified in accordance with FAR Part 135 and authorized to provide, on demand, public transportation of persons and property by aircraft. Air charters generally operate small aircraft "for hire" for specific trips.

Air taxi: See air charter.

Air traffic control: A term used to denote a number of different types of facilities which are operated by or under the auspices of the Federal Aviation Administration and which provide informational, navigational, and collision avoidance services to aircraft in flight. Air traffic control towers and air route traffic control centers are elements of the air traffic control system.

Air traffic control tower (ATCT) ("tower"): A facility located within the physical boundaries of certain airports and consisting of a tower which provides visual and/or radar tracking, ground-to-air radio communications, traffic management, and limited informational, navigational, and separation services to aircraft operating in the immediate vicinity of an airport.

Air route traffic control center (ARTCC): A facility which provides radar tracking and informational, navigational, and separation services to aircraft operating beyond the immediate vicinity of an airport.

Airport Operation: A take off or a landing.

Angle of descent: The angle, with respect to a horizontal plane, of the flight path of an aircraft descending from a higher altitude to a lower altitude (usually expressed in degrees or in feet per nautical mile). Also referred to as **descent slope**.

Approach angle: The angle, with respect to a horizontal plane, of the flight path of an aircraft descending to land at an airport (usually expressed in degrees or in feet per nautical mile). Also referred to as **approach slope**.

Approach lighting system (ALS): An airport lighting system which, by means of a standardized array of lights on the ground provides visual cues which enable pilots or aircraft approaching the runway in conditions of darkness or poor visibility, to align the flight path of the aircraft with the extended centerline of the runway.

Banks: As employed in the Land Use Matrix and other sections of this ALUP, the term "banks" shall encompass any land use whereby some or all of the financial services customarily provided by banking institutions are offered to the general public. Examples include traditional banks, savings and loan associations, and credit unions. The provision of banking services at a site, which is predominantly devoted to a compatible use (e.g., in-store supermarket bank branches, automated teller machines), however, shall not be considered as banks in the context of this ALUP.

Base leg: A segment of the standard airport traffic pattern which extends at right angles from the extended runway centerline at some distance from the approach end of the runway. The base leg extends from the downwind leg of the traffic pattern to the final approach course (extended runway centerline) and is flown in the direction toward the runway centerline. The altitude of aircraft flying the base leg is usually between 1000 and 400 feet above ground level.

Churches: As employed in the Land Use Matrix and other sections of this ALUP, the term "churches" shall denote any land use devoted exclusively or primarily to religious worship. Classrooms and/or meeting rooms may be included as part of a church if sufficient conditions are placed upon the development to ensure that such facilities will be utilized only for religious instruction or church-related meetings and that their use for such purposes will remain subsidiary to the primary activity of religious worship. In the absence of such conditions, classroom facilities which would be suitable for regular religious or non-religious education of students will be considered a school.

Circle-to-Land Procedure: A series of standardized aerial procedures which enable aircraft which have completed an instrument approach intended to culminate in a landing on a specified runway to maneuver for landing on a different runway than specified in the basic instrument approach while maintaining visual contact with the airport.

Climb gradient: The angle, with respect to a horizontal plane, of the flight path of an aircraft ascending from a lower altitude to a higher altitude (usually expressed in feet per nautical mile).

Closed traffic: An airborne maneuver by which an aircraft takes off from and lands at an airport without leaving the immediate airport vicinity (usually performed as a flight training or practice maneuver) or the airport traffic pattern flown by such an aircraft.

Community noise equivalent level (CNEL): A measure, in decibels, of the cumulative noise exposure at a given site. The CNEL mathematically increases the significance of noise events occurring during evening and nighttime hours, in response to the widely-held assumptions that such events are more intrusive than similar events occurring during daytime hours.

Compatible: A designation employed within the Land Use Matrix (Table 2-2) to denote that a proposed land use is not prohibited or restricted by the Land Use Matrix within the specified zone.

Consistent: A determination made by the ALUC when a referral meets the conditions outlined in the ALUP.

Crosswind departure: A VFR departure procedure in which an aircraft exits the airport area by extension of the crosswind leg of the traffic pattern.

Crosswind leg: A segment of the standard airport traffic pattern which extends at right angles from the extended runway centerline at some distance from the departure end of the runway. The base leg extends from the upwind leg of the traffic pattern to the downwind leg and is flown in the direction away from runway centerline.

Course Deviation Indicator (CDI): An instrument commonly installed in aircraft and utilized for aerial navigation, which depicts the location, in the horizontal plane, of the aircraft relative the intended direction of flight.

Decibel (dB): A unit for expressing the relative intensity of sounds on a scale of zero for the average least perceptible sound to about 130 for the average pain level.

Decision altitude (DA): The minimum altitude above mean sea level to which an aircraft operating according to a precision instrument approach may descend without visual contact with the airport or the airport environs.

Decision height (DH): The minimum vertical distance above the height of the intended landing zone to which an aircraft operating according to a precision instrument approach may descend without visual contact with the airport or the airport environs.

Density of Land Use: The number of people a development can attract per acre.

Density of Residential Development: The number of dwelling units per acre in a development or proposed development.

Departure Procedure (DP): See **instrument departure procedure**.

Descent slope: The angle, with respect to a horizontal plane, of the flight path of an aircraft descending from a higher altitude to a lower altitude (usually expressed in degrees or in feet per nautical mile). Also referred to as **angle of descent**.

Distance Measuring Equipment (DME): An apparatus, consisting of a ground-based radio transmitter and a specialized airborne receiver, which provides information regarding the slant-range distance of an aircraft from the ground-based facility. Also, by extension, any airborne maneuver, course, or flight path which is determined through the application of DME information.

Downwind departure: A VFR departure procedure in which an aircraft exits the airport area by extension of the downwind leg of the traffic pattern.

Downwind leg: A segment of the standard airport traffic pattern which is parallel to the runway of intended landing, is usually between 1/2 and 1 1/2 miles lateral to the runway, and is flown in a direction opposite to the direction of intended landing. The downwind leg is, in most instances, is the initial leg of the traffic pattern for landing aircraft. The altitude of aircraft flying the base leg is usually between 1000 and 800 feet above ground level.

Emergency Aircraft Landing Site: Any area of usable space which is at least 300 feet in length and 75 feet in width and which is oriented in such manner that its long axis is approximately parallel to the most frequently used adjacent flight path or paths.

Enplaned passengers: The total number of revenue-producing passengers boarding aircraft, including originating, stopover, and transfer passengers, in scheduled and nonscheduled services.

Fixed base operator (FBO): A provider of support services to users of an airport. Such services include fueling, hangaring, flight training, repair, maintenance, and other services.

General aviation: That portion of civil aviation which encompasses all facets of aviation except air carriers and air charters.

Glide slope: An apparatus which provides, by means of radio signals or light signals, vertical guidance to aircraft approaching to land, or (by extension) the vertical flight path flown by aircraft receiving guidance from such a system.

Global positioning system (GPS): A navigational aid which determines the position, direction of flight, speed, and (to a limited extent) altitude of an aircraft by means of signals received from a constellation of earth-orbiting satellites.

Global positioning system (GPS) approach: A series of standardized, predetermined, and published aerial maneuvers which are based on navigational data received from earth-orbiting satellites and which enable aircraft to descend toward an airport with the intention of landing when meteorologic conditions are such that a safe approach cannot be made solely through the use of visual information. A typical GPS approach permits aircraft to descend to within 400-500 feet of the surface solely on the basis of satellite navigation aids.

Global positioning system (GPS) overlay: An FAA designation applied to certain instrument approach procedures originally designed to be executed by reference to ground-based navigational aids which authorizes pilots to perform the approach solely by reference to navigational information provided by earth-orbiting GPS satellites.

Gross Area or Gross Acreage: For the purposes of this ALUP, the terms *gross area* and *gross acreage* will be considered interchangeable, and will be considered to indicate a measurement of the entire size of the site, parcel, intended use, or zone specified by a referral to the ALUC.

Hospitals: As employed in the Land Use Matrix and other sections of the ALUP, the term "hospitals" shall encompass any facility other than a private physician's office or outpatient clinic, in which care is offered to individuals who exhibit physical, emotional, or mental disability or illness. Examples include acute care hospitals, freestanding emergency rooms, nursing homes, board-and-care facilities, birthing centers, mental institutions, and rehabilitation centers.

Hotels & Motels: For purposes of the Land Use Matrix and other sections of the ALUP, the term "hotels & motels" shall denote any structure or facility intended or suitable for short-term occupancy by persons as a temporary dwelling. Examples of this type of land use include hotels, motels, bed and breakfast inns, youth hostels, pensions, and temporary shelters.

Inconsistent: A determination made by the ALUC when a proposed local action does not meet the conditions outlined in the ALUP.

Instrument approach: A series of standardized, predetermined, and published aerial maneuvers which are based on navigational data received from ground-based navigational aids or satellites and which enable aircraft to descend toward an airport with the intention of landing when meteorologic conditions are such that a safe approach cannot be made solely through the use of visual information.

Instrument departure procedure (DP): A series of standardized, predetermined, and published aerial maneuvers which are based on navigational data received from ground-based navigational aids or satellites and which enable aircraft to depart from an airport when meteorologic conditions are such that a safe departure cannot be made solely through the use of visual information. Formerly known as a **standard instrument departure (SID)**.

Instrument flight rules (IFR): A set of FAA rules, regulations, and procedures which define flight operations under conditions which do not permit navigation by means of visual information alone. Also employed as an adjective to designate a flight plan which will enable an aircraft to operate under conditions which preclude navigation by means of visual information.

Instrument landing system (ILS): A precision instrument approach system which provides aircraft with both vertical (glideslope) and lateral guidance by means of radio signals transmitted from installations within the physical boundaries of the airport.

Instrument landing system (ILS) approach: A series of standardized, predetermined, and published aerial maneuvers which are based on vertical and lateral navigational data received from radio transmitters located within the physical boundaries of the airport and which enable aircraft to descend toward an airport with the intention of landing when meteorologic conditions are such that a safe approach cannot be made solely through the use of visual information. A typical ILS approach permits aircraft to descend to within 200 feet of the surface.

Instrument meteorologic conditions (IMC): Weather conditions specified in FAA regulations under which aircraft are not authorized to takeoff, land, or maneuver under visual flight rules and may operate only by reference to electronic aids to navigation. The visibility and cloud clearance requirements for IMC are determined by the airspace designation in which and aircraft is operating, by the aircraft's altitude above both sea level and ground level, and by whether the aircraft is operating in daylight or at night.

Localizer (LOC): An apparatus which provides, by means of radio signals from a transmitter located within the physical boundaries of an airport and a specialized airborne receiver, lateral course guidance for aircraft descending to land.

Localizer approach: A series of standardized, predetermined, and published aerial maneuvers which are based on lateral guidance information received by means of a localizer transmitter located within the physical boundaries of an airport and which enable aircraft to descend toward an airport with the intention of landing when meteorologic conditions are such that a safe approach cannot be made solely through the use of visual information. Localizer approaches do not provide vertical guidance, but localizers are often coupled with glide slope transmitters. A typical localizer approach permits aircraft to descend to within 400-500 feet of the surface solely on the basis of radio navigation aids.

Localizer-type directional array (LDA): A type of apparatus which provides, by means of radio signals from a transmitter located within the physical boundaries of an airport and a specialized airborne receiver, lateral course guidance for aircraft descending to land. The primary distinction between an LOC and an LDA is that the final approach course provided by the LDA is not aligned with the runway centerline. Glide slope information is never provided in conjunction with an LDA.

Localizer-type directional array (LDA) approach: A series of standardized, predetermined, and published aerial maneuvers which are based on lateral guidance information received by means of an LDA transmitter located within the physical boundaries of an airport and which enable aircraft to descend toward an airport with the intention of landing when meteorologic conditions are such that a safe approach cannot be made solely through the use of visual information.

Minimum descent altitude (MDA): The minimum altitude above mean sea level to which an aircraft operating according to a non-precision instrument approach may descend without visual contact with the airport or the airport environs.

Minimum descent height (MDH): The minimum vertical distance above the height of the intended landing zone to which an aircraft operating according to a non-precision instrument approach may descend without visual contact with the airport or the airport environs.

Missed approach: An instrument approach which does not terminate in a landing. Usual reasons for a missed approach include failure to establish visual contact with the airport environs at the completion of an instrument approach, loss of course guidance, or instructions from air traffic control.

Missed approach course: A standardized, predetermined, and published flight path to be flown in the event of a missed approach.

Multifamily residential (land use): Any project, development, or other land use in which separate families or individuals occupy dwelling units which share a common wall or a common roof, or occupy a common legal parcel of real estate. Examples include duplexes, triplexes, quadriplexes, apartment buildings, condominiums, townhouses, and residential courts. In addition, institutional uses such as hospitals, nursing homes, board and care facilities, correctional institutions, and boarding schools, which entail the long-term occupancy of a single-structure by unrelated individuals will be considered to be multifamily residential in nature.

Nautical mile (nm): a measure of distance equal to 6076.115 feet (1852 meters).

Non-directional beacon (NDB): A radio beacon which transmits signals which do not contain encoded directional information, but which can be used for as a "homing" signal for aircraft tracking to or away from the transmitter.

Non-directional beacon (NDB) approach: A series of standardized, predetermined, and published aerial maneuvers which are based on lateral guidance information received by means of an NDB transmitter located either at or remote from an airport and which enable aircraft to descend with the intention of landing when meteorologic conditions are such that a safe approach cannot be made solely through the use of visual information.

Non-precision instrument approach procedure: An instrument approach procedure for which vertical guidance is not provided. Common types of non-precision instrument approach procedures include VOR, GPS, localizer, NDB, and LDA.

Office buildings: As employed in the Land Use Matrix and other sections of the ALUP, the term "office buildings" shall encompass any development, regardless of structure size, which includes significant floor space suitable for use by personnel performing or providing clerical, professional, or financial services as a primary use. The presence of limited office space for support of another primary function which is consistent with the ALUP, however, is not considered an "office building" under this definition.

Open Space: Land which is substantially free of structures, vehicles, and trees, which is relatively smooth and level, and which is devoted to use characterized by low occupancy levels.

Operation: A takeoff or landing

Precision instrument approach procedure: An instrument approach procedure for which vertical guidance is provided. ILS is the only common type of precision instrument approach currently in use. In the near future, certain GPS approaches will be upgraded to provide vertical guidance information, as well.

Prohibited: A determination made by the ALUC when a proposed local action does not meet the criteria set forth in the Land Use Matrix.

Public buildings: For purposes of the Land Use Matrix and other sections of the ALUP, the term "public buildings" shall be taken to mean structures which are utilized by government or social agencies for the provision of services to the public. Examples of such uses would include post offices, police or fire stations, and offices and agencies of local, state, or federal government.

Rate of climb: The vertical speed or rate of change in altitude of an aircraft ascending from a lower altitude to a higher altitude (usually expressed in feet per minute).

Rate of descent: The vertical speed or rate of change in altitude of an aircraft descending from a higher altitude to a lower altitude (usually expressed in feet per minute).

Rural residential (land use): As employed in the Land Use Matrix and other sections of the ALUP, the term "rural residential" indicates use of land for dwellings in such manner that no more than one primary dwelling unit is developed per five acres of property.

Single-family residential (land use): As employed in the Land Use Matrix and other sections of the ALUP, the term "single-family residential" indicates use of land for dwellings in such manner that no more than one primary dwelling unit is developed on each legal parcel and the size of each legal parcel is less than one acre.

Schools, colleges, and universities: For purposes of the Land Use Matrix and other sections of the ALUP, the term "schools, colleges, and universities" shall be taken to indicate any land use in which groups of individuals, particularly children, are engaged in activities, either formal or informal, which are intended to provide instruction, information, or mental or intellectual stimulation. Examples of such uses would include primary, secondary, or high schools (public or private), colleges, universities, graduate schools, specialized vocational schools, seminaries, nurseries, pre-schools, and day care centers.

Standard instrument departure (SID): See **instrument departure procedure**.

Standard Terminal Arrival Route (STAR): A series of standardized, predetermined, and published routes, procedures and/or maneuvers which enable aircraft to transition safely from the en route environment to the terminal environment. A STAR does not culminate in a landing, but terminates at a point from which an instrument approach to landing may be initiated.

Straight-out departure: A VFR departure procedure in which an aircraft exits the airport area along the extended centerline of the departure runway by extension of the upwind leg of the traffic pattern.

Suburban residential (land use): As employed in the Land Use Matrix and other sections of the ALUP, the term "suburban residential" indicates use of land for dwellings in such a manner that no more than one primary dwelling unit is developed on each legal parcel and the size of each legal parcel is 1 acre to 5 acres.

Tactical air navigation facility (TACAN): A ground-based radio navigational aid which transmits encoded signals that enable aircraft equipped with appropriate receivers to determine both bearing and distance with respect to the facility. The information with respect to bearing is generally available only to military aircraft, while information regarding distance is usable by both military and civil aircraft. TACAN facilities are frequently co-located with VORs.

Unobstructable Emergency Aircraft Landing Site: Any emergency aircraft landing site which cannot be eliminated or reduced in size without a general plan amendment, specific plan or specific plan amendment, zoning ordinance or zoning ordinance amendments, or other referring agency action which requires mandatory review by the ALUC.

Upwind leg: A segment of the airport traffic pattern which is coincident with the centerline of the departure runway. The upwind leg is the initial leg of the traffic pattern for departing aircraft and extends from takeoff to the crosswind leg or departure from the airport area.

Very high frequency omnidirectional range (VOR): A ground-based radio navigational aid which transmits encoded signals that enable aircraft equipped with appropriate receivers to determine their bearing with respect to the facility.

Very high frequency omnidirectional range with distance-measuring equipment (VOR-DME): A ground-based radio navigational aid which combines a VOR transmitter with a DME facility and which transmits encoded signals that enable aircraft equipped with appropriate receivers to determine both relative bearing and distance with respect to the facility.

Very high frequency omnidirectional range with tactical air navigation (VORTAC): A ground-based radio navigational aid which combines a VOR transmitter with a TACAN facility and which transmits encoded signals that enable both military and civilian aircraft equipped with appropriate receivers to determine both bearing and distance with respect to the facility.

Visual approach: A procedure whereby an aircraft which is operating in VMC according to an IFR flight plan and under control of an air traffic control facility may proceed to the airport of destination and land using visual navigational cues.

Visual approach slope indicator (VASI): A navigational aid installed adjacent to an airport runway which provides, by means of colored light beams, vertical course guidance to aircraft approaching to land on that runway. The usual descent slope provided by VASI installations is 3°.

Visual flight rules (VFR): A set of FAA rules, regulations, and procedures which define flight operations under conditions which allow navigation by means of visual information, pilotage, and dead reckoning alone. Also employed as an adjective to designate a flight plan which will enable an aircraft to operate under conditions which permit navigation by means of visual information alone. For takeoff and landing, operation under visual flight rules requires 3 statute miles visibility and a cloud ceiling of at least 1000 feet. A special VFR clearance may be obtained from ATC if visibility is 1 statute mile or greater and the pilot can maneuver to remain clear of clouds in the vicinity.

Visual meteorologic conditions (VMC): Weather conditions specified in FAA regulations under which aircraft are authorized to takeoff, land, and maneuver under visual flight rules and by means of only visual navigational information. Electronic aids to navigation may be utilized by aircraft operating in VMC, but are not required. The visibility and cloud clearance requirements for VMC are determined by the airspace designation in which and aircraft is operating, by the aircraft's altitude above both sea level and ground level, and by whether the aircraft is operating in daylight or at night.

VOR approach: A series of standardized, predetermined, and published aerial maneuvers which are based on lateral guidance information received by means of a VOR transmitter and which enable aircraft to descend toward an airport with the intention of landing when meteorologic conditions are such that a safe approach cannot be made solely through the use of visual information. The VOR facility may be located within the physical boundaries of the destination airport or at some distance from the airport. VOR approaches do not provide vertical guidance. A typical VOR approach permits aircraft to descend to within 400-500 feet of the surface solely on the basis of radio navigation aids.