CHAPTER 3
Livermore Municipal Airport Policies

3.1 Purpose and Scope

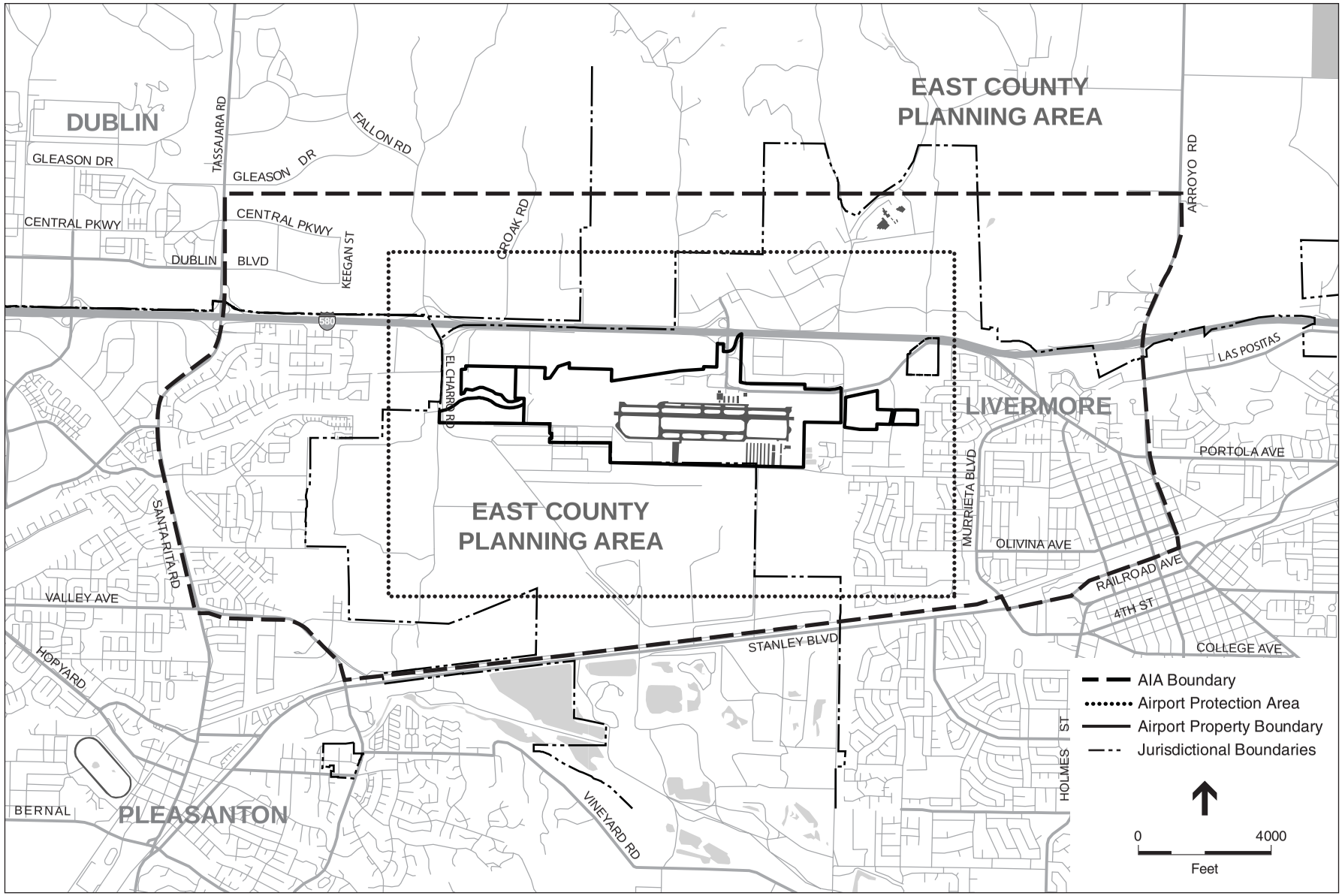
Chapter 3 of the Airport Land Use Compatibility Plan (ALUCP) for Livermore Municipal Airport (LVK) presents the criteria, maps, and policies to be utilized by the Alameda County Airport Land Use Commission (ALUC) and other local jurisdictions. These policies shall apply when reviewing proposals for land use development within the airport influence area (AIA) for compatibility with airport operations. The ALUC and affected cities within the AIA shall also use these policies when modifying respective general plans, zoning ordinances, and other local land use policies. The authority for such reviews derives from the California State Aeronautics Act (Public Utilities Code, Section 21670 *et seq*.).

This ALUCP is based on the LVK's most recent Airport Layout Plan (ALP), which depicts both near term and future 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. The *Livermore Municipal Airport Master Plan* was last updated in 1975. Due to its age, the City rescinded the document in March of 2010, and development at LVK is now guided by the General Plan, and the operation and development policies relevant to the Airport Zoning District in which LVK is located. Forecasts and noise contours developed and approved as part of the Livermore Municipal Airport General Plan Amendment and Rezoning (see Chapter 4) were utilized to create noise compatibility zones and policies.

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

3.1.1 Airport Influence Area

The airport influence area (AIA) is the area within which the ALUC is authorized to review local land use actions affecting the area, including adoption or amendments of general plans, specific plans, zoning ordinances, and building regulations. Figure 3-1 shows the AIA for LVK. The AIA was designated following an evaluation of political boundaries, noise contours, flight tracks, safety zones, and navigable airspace. The AIA extends west to Santa Rita Road, south to Stanley Boulevard. To the east, the limits of the AIA follow North Livermore Avenue, and to the north it



SOURCE: Alameda County, 1994; City of Pleasanton, 1996; City of Livermore, 2003; City of Dublin, 2006; and ESA, 2007

Figure 3-1
Airport Influence Area

extends from Tassajara Road to North Livermore Avenue. The AIA includes portions of the cities of Livermore, Pleasanton, Dublin, and unincorporated Alameda County.

3.1.2 Airport Protection Area

The Alameda County ALUC established the airport protection area (APA) in 1993, in order to prevent the encroachment of incompatible land uses near the vicinity of LVK. Criteria related to the APA are presented in Policy 3.3.2.6. The boundaries of the APA are as follows: 5,000 feet north from Runway 7L-25R; 5,000 feet south from Runway 7R-25L; 5,000 feet east from the end of Runway 25R; and 7,100 feet west from the end of Runway 7L (see Figure 3-1).

3.2 Compatibility Factors and Zones

3.2.1 Noise Compatibility Zones

The noise contours established for the purpose of evaluating the noise compatibility of land use development in the LVK airport influence area are depicted on Figure 3-2. As shown, the 55, 60, and 65 Community Noise Equivalent Level (CNEL) contours associated with the Airport Layout Plan (ALP) remain within the AIA. Table 3-1 identifies land uses that are compatible within the 65, 60 and 55 CNEL contours.

3.2.2 Safety Zones

To depict the relative risks of aircraft accidents near airport environs, the *California Airport Land Use Planning Handbook* (Caltrans, 2002) identifies 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 using 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. Although the accident database is national in scope, the safety zones established for LVK are based on accident data from general aviation airports with similar operational characteristics (e.g., runway lengths, classes of aircraft flow, traffic patterns, etc.) as those found at the LVK.

A total of seven different safety zones are shown in Figure 3-3. The choice of safety zone criteria appropriate for a particular zone is largely a function of risk acceptability. For example, some land uses (e.g., schools and hospitals) represent intolerable risks when located near aircraft operation areas and are prohibited. 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. (Table 3-2 presents a list of compatible land uses within each safety zone.)

3.2.3 FAR Part 77 (Airspace Protection)

The airspace protection zones established for the purpose of evaluating the airspace compatibility of land use development are depicted on Figure 3-4. The zones represent the imaginary surfaces defined for the Airport in accordance with Federal Aviation Regulation (FAR) Part 77. For more information about FAR Part 77 and airspace protection, refer to Appendix C.

3.2.4 Overflight Zones

The overflight zones established for the purpose of providing overflight notification for land uses near LVK are depicted in Figure 3-5. These zones are established to reflect standard traffic patterns and suggested approach and departure paths in the vicinity of LVK.

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 3-2 and Table 3-1 during the evaluation of proposed land uses within the AIA for LVK.

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. Noise compatibility policies only apply to the identified noise contours. Within the identified 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 LVK 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 3-2 were created for the 2010 Airport Rezoning and General Plan Amendment 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 55 dB CNEL contour. All proposed land use changes that would sustain noise exposure at a level that is less than 55 CNEL are 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 unconditionally acceptable for new residential uses in the vicinity of LVK is 59-64 dB, depending upon the type residential land uses in accordance with Table 3-1.

b. The compatibility of new nonresidential development with noise levels generated by the Airport is indicated 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

Within all identified noise contours, 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. A maximum, aircraft-related, interior noise level of 45 dB CNEL shall be considered acceptable for the following (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.

   Calculations should assume that windows are closed.

b. The maximum, aircraft-related, interior noise level which shall be considered acceptable for the following land uses 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:

   1. Any hotel or motel, hospital or nursing home, church, meeting hall, office building, mortuary, school, library, museum, or other noise-sensitve non-residential use within Noise Contours as identified in Figure 3-2.

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 3-2). However, the ALUC may consider noise from these sources when reviewing the compatibility of proposed land uses to the extent that this noise is reflected in airport noise contours approved by the airport operator and the ALUC.

b. Noise from aircraft ground operations 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[1]	Exterior Noise Exposure (dB CNEL)			
	<55	55-59	60-64	>65
Agricultural, Recreational, and Animal-Related				
Outdoor amphitheaters	P	P	P	X
Zoos; animal shelters; neighborhood parks; playgrounds	P	P	P	X
Regional parks; athletic fields; golf courses; outdoor spectator sports; water recreation facilities	P	P	P	C
Nature preserves; wildlife preserves; livestock breeding or farming	P	P	P	X
Agriculture (except residences and livestock); fishing	P	P	P	P
Residential, Lodging, and Care				
Residential, (including single-family and mobile homes)	P	P	C	X
Residential,(multi-family; retirement homes; residential; residential hotels)	P	P	P	X
Residential hotels; retirement homes; hospitals; nursing homes; intermediate care facilities	P	P	P	X
Hotels; motels; other transient lodging	P	P	P	X
Public				
Schools; libraries	P	P	P	C
Auditoriums; concert halls; indoor arenas; places of worship; cemeteries	P	P	P	P
Commercial and Industrial				
Office buildings; office areas of industrial facilities; medical clinics; clinical laboratories; commercial - retail; shopping centers; restaurants; movie theaters	P	P	P	C
Commercial - wholesale; research and development	P	P	P	C
Industrial; manufacturing; utilities; public rights-of-way	P	P	P	C

Land Use	Acceptability	Interpretation/Comments
P	Permitted	*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.
C	Conditional	*Indoor Uses*: Building structure must be capable of attenuating exterior noise to the indoor CNEL indicated by the number; 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.
X	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.

[1] Land uses not specifically listed shall be evaluated using the criteria for similar uses.

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 will be applied to the areas with greatest risk potential.

3.3.2.2 Evaluation

The safety compatibility of proposed uses within LVK's AIA should be evaluated in accordance with the policies set forth in this section, including the safety zones presented on Figure 3-3 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 LVK 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 general aviation airports nationwide.

However, state law provides that ALUCs, while required to be guided by the Handbook, may develop height restrictions on buildings, specify use of land, and determine building standards, including soundproofing adjacent to airports within the AIA (per PUC §21675(a)). The ALUC will also take into consideration the type of and location of proposed land uses apart from aircraft accident distribution patterns within the AIA, in order to minimize exposure to excessive noise and safety hazards within areas around LVK to the extent that the areas are not already devoted to incompatible uses, and to safeguard against safety problems related to airport use.

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 will be applied to the areas where the greatest risk of aircraft accidents is likely to occur (as delineated by the Caltrans Handbook), or where land uses put vulnerable populations at an intolerable risk from potential aircraft accidents.

b. Runway length and approach categories for each runway at LVK. 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 LVK among three thriving cities 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.

d. The ALUC recognizes buildings with higher and/or vulnerable populations present an added risk and are therefore, restricted within some safety zones. Where not restricted, the California Building Code (CBC) requires additional safety measures for these types of buildings.

3.3.2.5 Airport Safety Zones

A total of seven different safety zones were identified based on runway length and flight patterns (see Figure 3-3). 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 intolerable 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.

In certain situations, the potential risk of an aircraft accident occurring in a location where large numbers of people assemble or have restricted mobility, such as sports stadiums, amphitheaters, etc., may be perceived as an intolerable risk no matter where it may be located within an AIA.

a. The following safety zones are identified for the purpose of presenting safety policies:

- 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 outside of Zones 1 – 6, but within the AIA

3.3.2.6 Airport Protection Area (APA)

The boundaries of the APA around LVK are as follows (see Figure 3-1):

North Boundary: Running generally east to west, parallel to and extending north for a perpendicular distance of 5,000 feet from Runway 7L-25R.

South Boundary: Running generally east to west, parallel to and extending south for a perpendicular distance of 5,000 feet from Runway 7R-25L.

East Boundary: Running generally north to south, perpendicular to and extending 5,000 feet east from the east end of Runway 7L-25R.

West Boundary: Running generally north to south, perpendicular to and 7,100 feet west from the west end of Runway 7L-25R.

New residential land use designations, or the intensification of existing residential land uses, are prohibited within the APA. Nonresidential land uses may be allowed within the APA insofar as they are consistent with the criteria set forth in Policy 3.3.2.8 of this compatibility plan.

Should the City of Livermore, after adoption of this ALUCP, modify City of Livermore Resolution 192-91, which establishes the APA, or adopt a new Resolution, the ALUC shall acknowledge the modification of the APA for purposes of transit-oriented residential development around the future Isabel/I-580 BART station in subsequent land use reviews, and shall revise this policy at the earliest possible date as provided by state law.

3.3.2.7 Residential Development Criteria

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

a. Except for those portions of Zone 4 outside the APA (see Policy 3.3.2.7(b)), neither new residential land uses, nor the intensification of Existing Land Uses shall be allowed within Zones 1 through 5, with the exception of the construction of a secondary dwelling unit.

b. Within those portions of Zone 4 that extend beyond the eastern boundary of the APA, new residential developments are required to meet the maximum intensities identified for both single-family and multi-family residential uses indicated in Table 3-2.

    1. Infill is allowed up to an average of the surrounding residential use, provided that other safety criteria identified in this plan are satisfied. Preserving the minimum amount of open space (as defined in Policy 3.3.2.12) is also encouraged.

c. Land uses shown as “conditional” should comply with all relevant criteria applied to the particular safety zone(s) in which they are proposed, as well as the conditions listed below.

    1. Land uses within safety zones 3 and 4 should be clustered, to the greatest extent practical, to preserve open space as specified in Table 3-2. (See Policy 3.3.2.11 for clustering criteria.)

2. For Conditional Uses located in Safety Zones 2 through 5 that are not Existing Land Uses, ALUC review is requested in an ADVISORY-ONLY capacity, even if the proposed land use is considered consistent with an adopted general or specific plan. (See Policy 2.6.1. Actions Requiring ALUC Review and 2.7.3.1 Initial Review of General Plan Consistency.)
3. An ALUC Advisory-Only review shall consist of the following:
    i. Review of project by ALUC staff and Commission at the next regularly scheduled meeting. The purpose of the meeting is to identify any design or locational strategies that could improve the survivability of building inhabitants in the event of an aircraft collision. Such features may include allowing fewer people per acre (site-wide average) than what is allowed for that particular safety zone, project relocation, clustering development to preserve open space, or other features that may be identified by the applicant, jurisdiction, or ALUC.
    ii. Conditions will be considered to be met upon the completion of project review by the ALUC, which includes an adopted resolution identifying any features recommended for incorporation by the jurisdiction with ultimate approval authority (e.g., Planning Commission, City Council, or Special District Board).

d. Secondary units, as defined by state law, shall be not be included in density calculations, and may be constructed on existing, non-conforming residential parcels.
e. No restrictions on residential development shall apply to the portions of Zones 6 and 7 that extend beyond the boundary of the APA.

3.3.2.8 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 3.3.2.9. 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 the number of people concentrated in areas most susceptible to aircraft accidents.

a. With respect to the vicinity of LVK, 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 indoors and outdoors, shall be limited to the intensities indicated in Table 3-2. Nonresidential intensity criteria derive from both the intensities for "rural/suburban" and "urban" settings (as set forth in Table 9C of the Caltrans Handbook), which reflects the current environment around LVK.
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.
    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 as "conditional" should comply with all relevant criteria applied to the particular safety zone(s) in which they are proposed, as well as the conditions listed below.

1. Land uses within safety zones 2 through 5 should be clustered, to the greatest extent practical, to preserve open space as identified in Table 3-2. (See Policy 3.3.2.11 for clustering criteria.)
2. For Conditional Uses in Safety Zones 2 through 5 that are not Existing Land Uses, ALUC review is requested in an ADVISORY-ONLY capacity, even if the proposed land use is considered consistent with an adopted general or specific plan. (See Policy 2.6.1. Actions Requiring ALUC Review and 2.7.3.1 Initial Review of General Plan Consistency.)
3. An ALUC Advisory-Only review shall consist of the following:
    i. Review of project by ALUC staff and Commission at the next regularly scheduled meeting. The purpose of the meeting is to identify any design or locational strategies that could improve the survivability of building inhabitants in the event of an aircraft collision. Such features may include allowing fewer people per acre (site-wide average) than what is allowed for that particular safety zone, project relocation, clustering development to preserve open space, or other features that may be identified by the applicant, jurisdiction, or ALUC.
    ii. 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.
4. Conditions will be considered to be met upon the completion of project review by the ALUC, which includes an adopted resolution identifying any design features recommended for incorporation by the jurisdiction with ultimate approval authority (e.g., Planning Commission, City Council, or Special District Board).

d. Land uses listed as "incompatible" should not be permitted to be developed within the indicated safety zones.

3.3.2.9 Land Uses of Particular Concern

The land uses that pose the greatest concern are those in which the occupants have reduced 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, the ill or infirm, and/or handicapped shall be prohibited within Zones 1 through 5. Children's schools are also prohibited in Safety Zone 6.

a. For the purposes of these criteria, children's schools include all grades through grade 12.
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 6 and 7 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.
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, conditional in Zone 6, and permissible in 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.
e. Storage 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 Zone 3, storage of fuel or other hazardous materials is permitted only if the substances are stored in underground tanks, and the quantity stored is no more than 2,000 gallons.

f. Land uses shown as "conditional" should comply with all relevant criteria applied to the particular safety zone(s) in which they are proposed, as well as the conditions listed below.
   1. Land uses within safety zones 2 through 4 should be clustered, to the greatest extent practical, to preserve open space as specified in Table 3-2. (See Policy 3.3.2.11 for clustering criteria.)
   2. For Conditional Uses located in Safety Zones 2 through 7 that are not Existing Land Uses, ALUC review is requested in an ADVISORY-ONLY capacity, even if the proposed land use is considered consistent with an adopted general or specific plan. (See Policy 2.6.1. Actions Requiring ALUC Review and 2.7.3.1 Initial Review of General Plan Consistency.)
   3. An ALUC Advisory-Only review shall consist of the following:
      i. Review of project by ALUC staff and Commission at the next regularly scheduled meeting. The purpose of the meeting is to identify any design or locational strategies that shall reduce or avoid harm to those on the ground resulting from a potential aircraft accident. Such features may include allowing fewer people per acre (site-wide average) than what is allowed for that particular safety zone, clustering development to preserve open space, or other features that may be identified by the applicant, jurisdiction, or ALUC.
      ii. Conditions will be considered to be met upon the completion of project review by the ALUC, which includes an adopted resolution identifying any design features recommended for incorporation by the jurisdiction with ultimate approval authority (e.g., Planning Commission, City Council, or Special District Board).

g. Land uses listed as "incompatible" should not be permitted to be developed within the indicated safety zones.

h. Though no limit is placed on the intensity of new uses within Safety Zones 6 and 7, exceptions to these criteria should be considered on a case-by-case basis by the ALUC when reviewing development proposals that entail large indoor or outdoor assembly facilities.

3.3.2.10 Mixed-Use Development

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

a. Mixed-use development involving new or intensified residential land uses within the designated APA is prohibited.

b. Where residential and nonresidential uses are proposed to be located in the same or nearby buildings, both residential and nonresidential density criteria must be met. 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 intended for suburban 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 above the limits set in Policy 3.3.1.5.

c. Where proposed development will contain a mixture of nonresidential land uses as identified in Table 3-2, the total number of occupants for all the 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 component 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 component use, the number of occupants may be estimated by using parking space requirements of the affected jurisdiction.

3.3.2.11 Criteria for Clustering of Development

a. The ALUC generally supports clustering as a means for both enhancing safety compatibility in the vicinity of airports and accomplishing other development objectives. Clustering occurs when development is concentrated on one portion of a site or within an overall safety zone, leaving other areas as open space. If the area remaining undeveloped is relatively level and free of large obstacles, clustering potentially allows a greater amount of open space towards which a pilot can land the aircraft if needed; 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.
b. No development shall be clustered in a manner that would exceed the intensity limits listed as incompatible in Table 3-2.

3.3.2.12 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. The following open land policies are considered recommendations, and generally only applicable to development projects of five acres or more.

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 0.5 acres in size.
b. Open land areas should be oriented with the typical direction of aircraft flight over the location in question.
c. Roads and automobile parking areas are considered acceptable as open land areas.
d. 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.
e. Clustering of development, as detailed in Policy 3.3.2.11 above, is encouraged as a means of increasing the size of open land areas.

TABLE 3-2
SAFETY COMPATIBILITY CRITERIA

Land Uses	Safety Compatibility Zones						
	1	2	3	4	5	6	7
Maximum Site-wide Average Non-Residential Intensity (People/Acre)	10	40	80	100	100	No Limit	No Limit
Recommended Open Land	100%	40%	30%	20%	20%	0%	0%
Non-Residential Land Uses							
➢ Note: Where uses are listed as "C"-Conditional, please refer to Section 3.3.2.8(c).							
Offices *(approx. 215 s.f./person)*	X	C	C	C	C	P	P
Small eateries/drinking establishments *(approx. 60 s.f./person)*	X	X	C	C	C	P	P
Medium sized business *(approx. 200 s.f./person)*	X	C	C	C	C	P	P
Mixed use retail centers with restaurant facilities (*approx. 110 s.f./ person*)	X	C	C	C	C	P	P
Retail center with no restaurant facilities (*approx. 170 s.f./ person*)	X	C	P	P	P	P	P
Residential Land Uses							
➢ Note: Where uses are listed as "C"- Conditional, please refer to Section 3.3.2.7(c)							
Short-term lodging Facilities (≤ 30 nights): hotels, motels, etc. (*approx. 200 s.f./person*)	X	X	C	C	X	P	P
Long-term lodging facilities (> 30 days): extended-stay hotels, dormitories, etc.	X	X	X	X	X	P	P
Single-family residential: detached dwellings, duplexes, townhomes, mobile homes	X	X	X	Zone 4: Incompatible at density > 4.5 d.u./ac	X	P	P
Multi-family residential: low-to-high density apartments, condominiums	X	X	X	Zone 4: Incompatible at density > 6.0 d.u./ac	X	P	P
Sensitive Land Uses (Land Uses of Particular Concern)							
➢ Note: Where uses are listed as "C"- Conditional, please refer to Section 3.3.2.9(f).							
Schools, K-12	X	X	X	X	X	X	P
Commercial Daycare (≥6)	X	X	X	X	X	C	P
Nurseries/In-home day care (≤14)	X	X	X	X	X	P	P
Inpatient facilities: hospitals, sanitariums, psychiatric facilities *(approximately 250 s.f./person)*	X	X	X	X	X	C	P
Outpatient facilities *(>5 patients):* dentist offices, clinics, etc. *(approximately 240 s.f./person)*	X	X	C	C	X	P	P
Congregate Care Facilities- ambulatory and non-ambulatory *(includes assisted living, convalescent/rehab facilities, retirement homes)*	X	X	X	X	X	C	P

TABLE 3-2
SAFETY COMPATIBILITY CRITERIA

Land Uses	Safety Compatibility Zones						
	1	2	3	4	5	6	7
Maximum Site-wide Average Non-Residential Intensity (People/Acre)	10	40	80	100	100	No Limit	No Limit
Recommended Open Land	100%	40%	30%	20%	20%	0%	0%
Correctional Facilities	X	X	X	X	X	C	P
High Capacity Indoor assembly room *(≥ 1,000 people)*	X	X	X	X	X	X	C
Medium to large indoor assembly room *(≥300. <1,000 people)*	X	X	X	C	X	C	C
Low capacity indoor assembly room *(≤ 300 people)*	X	X	C	C	X	C	P
Large outdoor assembly area *(≥1,000 people)*	X	X	X	X	X	X	C
Medium outdoor assembly area *(≥300, <999*)	X	X	C	C	X	P	P
Small outdoor assembly area (*≥50, ≤299*)	X	X	C	C	X	P	P
Manufacturing, R&D, Industrial Land Uses							
➢ Note: Where uses are listed as "C"-Conditional, please refer to Section 3.3.2.8(c).							
Manufacturing, research and development (*approx. 300 s.f./ person*)	X	X	C	C	C	P	P
Occupancies utilizing hazardous (flammable, explosive, corrosive, or toxic) materials	X	X	Zones 3 - 5: C "Conditional": Special measures to minimize risk in the event of an aircraft accident to be determined by permitting agencies.			P	P
Warehouses, distribution facilities (*approx. 500 s.f./ person*)	X	C	C	P	P	P	P
Storage of hazardous materials: gas stations, etc.	X	X	C	P	P	P	P
Repair garages not requiring use of flammable objects	X	P	P	P	P	P	P
Open parking garages	X	P	P	P	P	P	P
Private garages, carports, and agricultural buildings	X	P	P	P	P	P	P
Agriculture, Natural Features, Resource Operations							
➢ Note: These uses may attract birds or other wildlife considered potentially hazardous to flight. For uses listed as C-Conditional, please see Airspace Protection Policy 3.3.3.7(a)(5) and FAA Advisory Circular 150/5200-33B, located in Appendix C: FAA Airspace Protection Guidance. Commission review requested.							
Truck and specialty crops	X	X	X	X	X	P	P
Field and stalk crops	X	X	X	X	X	X	X
Pasture and range land	X	P	P	P	P	P	P
Orchards	X	X	X	X	X	X	P
Vineyards	X	X	X	X	X	C	P
Dry farm and grain	X	X	X	X	X	X	X
Tree farms, landscape nurseries,	X	X	C	C	X	P	P

TABLE 3-2
SAFETY COMPATIBILITY CRITERIA

Land Uses	Safety Compatibility Zones						
	1	2	3	4	5	6	7
Maximum Site-wide Average Non-Residential Intensity (People/Acre)	10	40	80	100	100	No Limit	No Limit
Recommended Open Land	100%	40%	30%	20%	20%	0%	0%
and greenhouses							
Fish farms	X	X	X	X	X	P	P
Feed lots and stockyards	X	X	X	X	X	P	P
Poultry farms	X	X	X	X	X	P	P
Dairy farms	X	X	X	X	X	P	P
Forest reserves	X	X	X	X	X	X	X
Fish and game reserves	X	X	X	X	X	X	X
Land reserves and open space	X	P	P	P	X	P	P
Waterways (rivers, creeks, swamps bays, lakes)	X	X	X	C	X	C	C
Reservoirs; quarry lakes; detention ponds; aquifer recharge; recycled water storage; flood control or water conveyance channels.	X	X	X	C	X	C	C
Utilities							
➢ Note: These uses may generate dust, smoke, thermal plumes, or other hazards to flight. These uses may attract birds or other wildlife considered potentially hazardous to flight. Power lines, smoke stacks, or other tall objects associated with these uses may be hazards to flight. For uses listed as C-Conditional, see Airspace Protection Policy 3.3.3.7(a)(5), and Section 3.3. Commission review requested.							
Water treatment	X	C	C	C	X	C	C
Electrical substations	X	X	C	X	P	P	P
Power plants	X	X	X	X	X	X	C
Power lines	X	X	X	X	X	P	P
Roadways	C	P	P	P	P	P	P
Other transit-oriented uses (train stations, bus stations, etc.)	X	C	P	P	P	P	P
Recreational Land Uses							
➢ Note: Golf courses and parks may attract birds or other wildlife considered potentially hazardous to flight. For uses listed as C-Conditional, see Airspace Protection Policy 3.3.3.7(a)(5), and Section 3.3. Commission review requested.							
Golf courses	X	X	X	X	X	X	C
Parks (playgrounds, picnic areas, athletic fields, tennis courts, etc.)	X	C	C	C	X	P	P
Riding stables and trails	X	P	P	P	P	P	P

Notes:
X – INCOMPATIBLE: Uses should not be permitted under any circumstances as they may expose persons to airport-related safety hazards.

C – CONDITIONAL: Uses or activities that may be compatible with airport operations depending on their location, size, bulk, height, density and intensity of use. See sections 3.3.2.7, 3.3.2.8, and 3.3.2.9 for conditional criteria on specific land uses.

P – PERMITTED: Uses or activities are compatible with airport operations, however, these activities should be reviewed to ensure that they will not create height hazard obstructions, smoke, glare, electronic, wildlife attractants, or other airspace hazards. Noise, airspace protection, and/or overflight policies may still apply.

All uses or activities identified in Table 3-2 are subject to intensity and density limitations as indicated. Particular attention should be given to developments that, when located in combination with other permitted or limited activities, may create cumulative impacts on airport operations. All uses should be reviewed to ensure that they will not create airspace hazards. Noise, airspace protection, and/or overflight policies may still apply.

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, and 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. 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 ensure that hazards to the navigable airspace are avoided. The policies set forth in this section apply to the entire AIA.

3.3.3.3 Measurement

Federal Aviation Regulations (FAR) Part 77, *Objects Affecting Navigable Airspace*, provides guidance for the height of objects that may affect normal aviation operations (see Appendix C). The guidance provided by Part 77 is not absolute, however. Deviation from the Part 77 standards does not necessarily mean that a safety hazard exists, only that offending objects must be evaluated by the FAA and that mitigation, such as marking or lighting may be required if appropriate. Figure 3-4 depicts the Part 77 surfaces in the vicinity of LVK.

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.

e. Jurisdictions or project proponents are encouraged to utilize guidance for the evaluation of projects within a civil airport's imaginary surfaces contained in Appendix C (see Section 77.19). Should further assistance be required in determining the potential for a proposed structure to penetrate LVK's imaginary surfaces, please contact the ALUC staff person, or airport manager.

3.3.3.6 Obstruction Marking and Lighting

FAA or the California Division of Aeronautics will determine the need for marking and lighting of an obstruction 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 that of the FAA. In such instances, the ALUC may determine either that a proposed structure is unacceptable or that it is acceptable only if marked and lighted. 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, and/or have demonstrated consideration/application of appropriate FAA guidelines.

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 that may impair pilot vision;

    3. Sources of steam or other emissions that may cause thermal plumes or other forms of unstable air that generate turbulence within the flight path;

    4. Sources of electrical interference with aircraft communications or navigation; and

    5. Features that create an increased attraction for wildlife as identified in FAA rules, regulations, and guidelines 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 farms, wind farms, etc.), proposed land uses of this type 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 LVK 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 City of Livermore). 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.

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 by the ALUC when evaluating new development. The boundaries of the overflight zones around LVK are identified in Figure 3-5.

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 LVK, 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 3-5, an overflight notification should be recorded.

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

b. The notification should be evident to prospective buyers of the property and should 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 or leasers of real property must disclose information regarding whether their property is situated within an AIA.

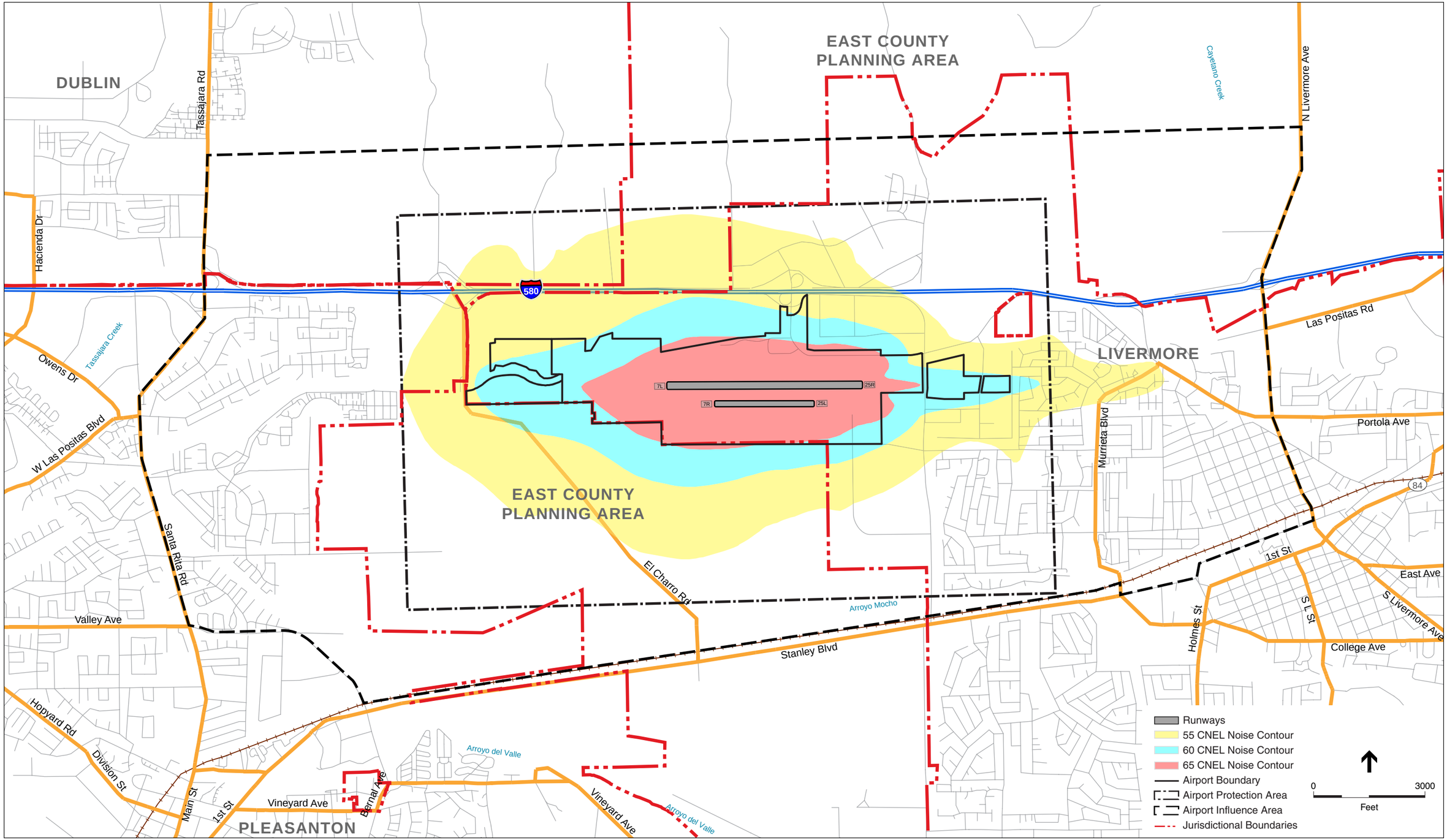
a. These state requirements apply to the sale or lease of newly subdivided lands and condominium conversions and to the sale of certain existing residential property.

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

   NOTICE OF AIRPORT IN VICINITY

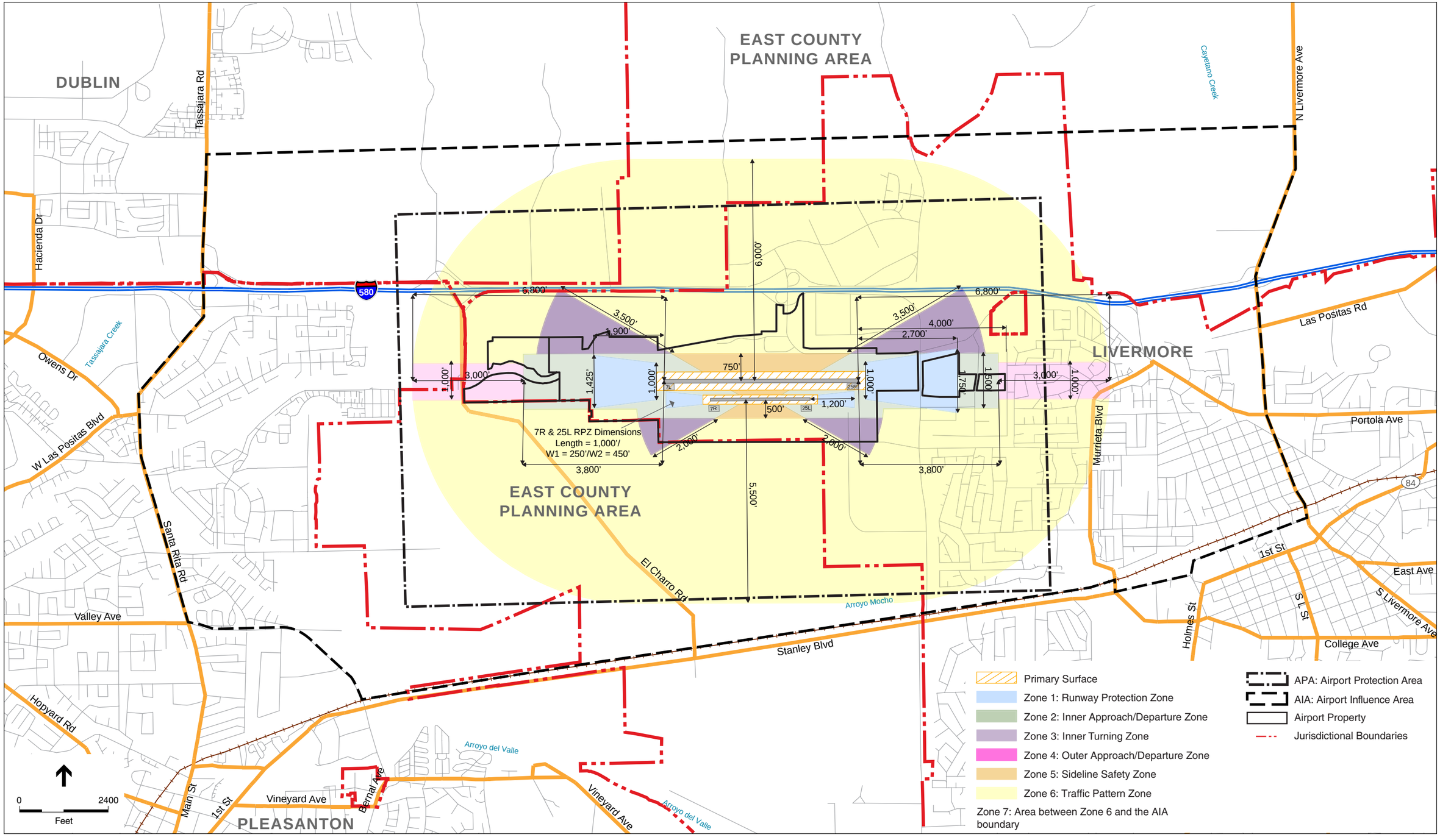
   This property is presently located in the vicinity of an airport, within what is known as an airport influence area. For that reason, the property may be subject to some of the annoyances or inconveniences associated with proximity to airport operations (for example: noise, vibration, or odors). Individual 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.

c. 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.



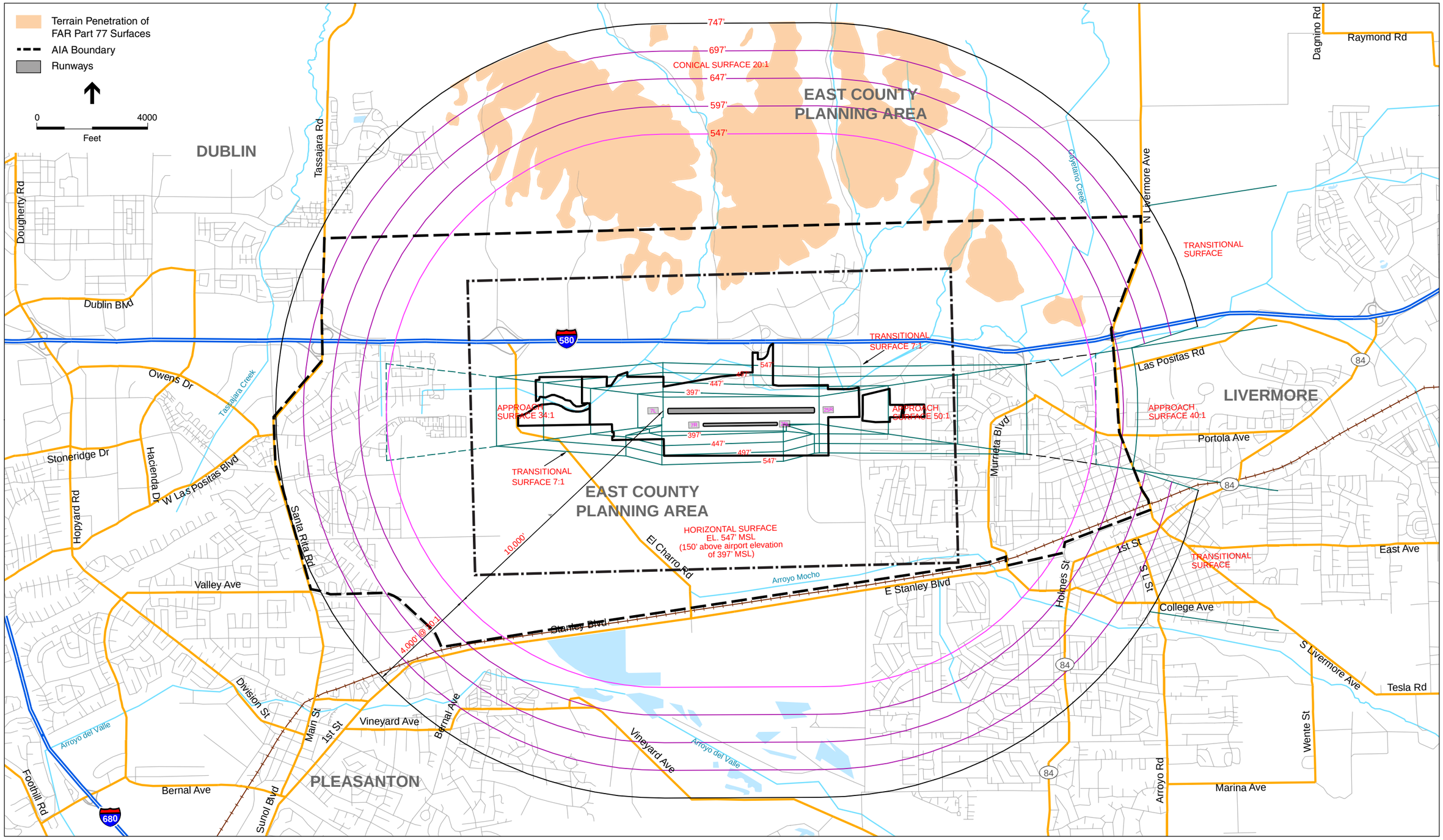
SOURCE: ESA Airports, 2009; ESRI, 2008; Brown-Buntin Associates, Inc., 2008; LSA Associates, Inc., 2009

Figure 3-2
Noise Compatibility Zones



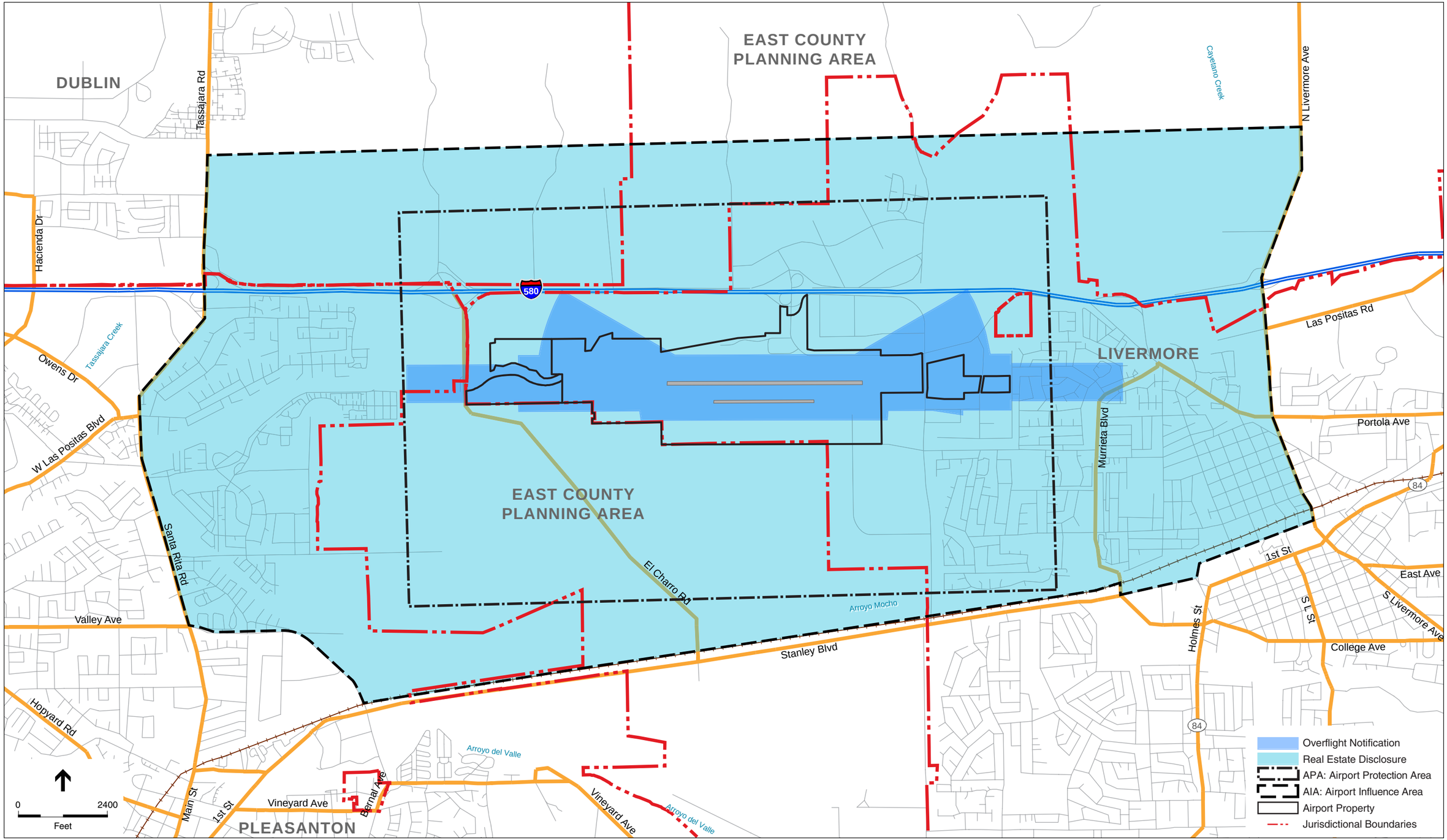
SOURCE: ESA Airports, ESRI, California Airport Land Use Planning Handbook (Caltrans, 2002)

Figure 3-3
Safety Compatibility Zones



SOURCE: ESA Airports, ESRI, Livermore Municipal Airport Layout Plan, Mead & Hunt

Figure 3-4
FAR Part 77 Surfaces



SOURCE: California Airport Land Use Planning Handbook (Caltrans, 2002); ESRI, 2007; and ESA, 2007

Figure 3-5
Overflight Compatibility Zones