APPENDIX A

Rio Vista Airport Draft ALUCP White Paper[1]

[1] Some technical information included in Appendix A may be outdated and has been updated in the ALUCP.

TABLE OF CONTENTS

Rio Vista Airport Draft ALUCP White Paper

List of Figures

List of Tables

DRAFT ALUCP WHITE PAPER

Rio Vista Airport

1. Introduction

The Solano County Airport Land Use Commission (ALUC) is preparing an update of the Rio Vista Airport (hereafter referred to as the Airport) Airport Land Use Compatibility Plan (ALUCP). This white paper discusses the major changes between the existing 1988 ALUCP for Rio Vista Airport and the contemporary airport planning policies and planning realities within portions of the City of Rio Vista and Solano County. In particular, the following issues will be addressed in this white paper:

- An overview of Article 3.5 of the Public Utilities Code (PUC) 21001 et seq. to set forth guidelines for airport land use planning in California;
- Existing and planned facilities at Rio Vista Airport;
- Existing operations at Rio Vista Airport;
- A summary of the 1988 Rio Vista ALUCP, along with a qualitative discussion of the changes that have occurred in airport land use planning in California since the adoption of the 1988 ALUCP;
- A qualitative discussion of the changes in operations that have taken place at the Airport since 1988;
- A table comparing policies from the 1988 ALUCP with applicable guidance from the 2011 California Airport Land Use Planning Handbook (2011 Handbook);
- A matrix containing sample compatibility criteria from the 2011 Handbook;
- A discussion of the changes in operations at Rio Vista Airport, along with 2035 aircraft operations data;
- A summary of the existing and planned land uses and zoning in the vicinity of the safety zones (portions of the City of Rio Vista and Solano County), with graphics to illustrate these features;
- A discussion of the potential conflicts between the updated ALUCP and the planned land uses and zoning in the vicinity of the safety zones (portions of the City of Rio Vista and Solano County); and

- Figures depicting the following:
  - The regional context for the Airport;
  - The proposed safety zones (portions of the City of Rio Vista and Solano County);
  - Noise contours, comparing 2015 contours with the 2035 forecast contours used in this Rio Vista Airport ALUCP;
  - The compatibility zones found in the 1988 Rio Vista Airport ALUCP;
  - The Wildlife Hazard Analysis (WHA) boundary;
  - Generalized existing land uses as they relate to the 2015 noise contours and the Airport vicinity;
  - Generalized planned land uses as they relate to the 2035 forecast contours and the Airport vicinity;
  - The compatibility zones at Travis Air Force Base as they relate to Rio Vista Airport; and
  - Title 14 Code of Federal Regulation (14 CFR) Part 77 surfaces.

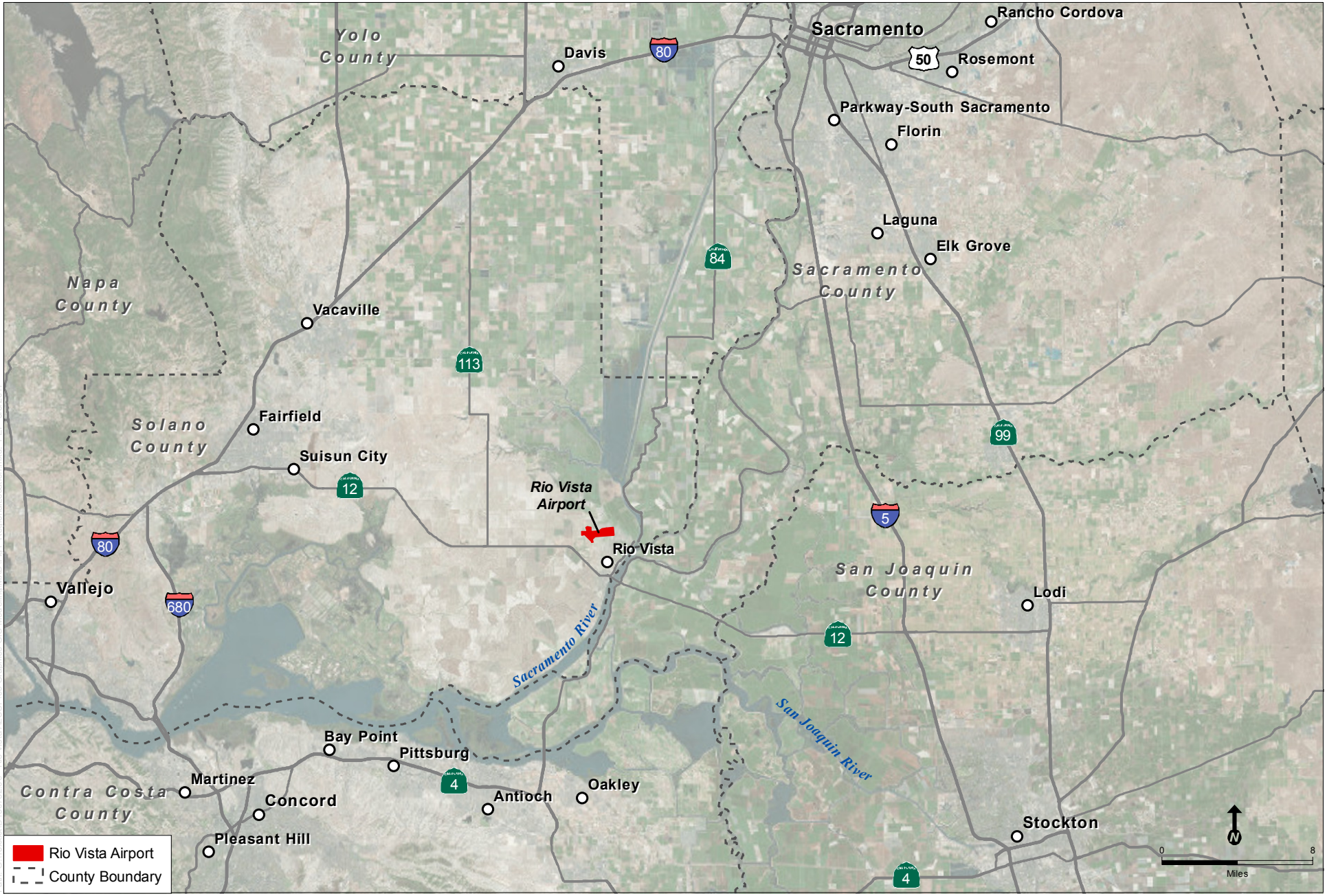
For this white paper, the compatibility zones from the 1988 Rio Vista ALUCP were modified to reflect both the current and projected aircraft operations at the Airport, with modifications also made to reflect newer development that has occurred within Rio Vista since the development of the last ALUCP. These modifications include both the safety zones covering new portions of Solano County and the addition of the WHA Boundary, based on the guidance in the 2011 Handbook.

Figure 1 depicts the general location of Rio Vista Airport within Solano County. **Figure 2** depicts the Rio Vista Airport Safety Zones.

2. Overview – Airport Land Use Commissions and ALUCPs

The State Aeronautics Act (Public Utilities Code, Section 21001 *et seq.*) requires the preparation of an ALUCP for nearly all public-use airports and military airfields in the state (Section 21675). The intent of an ALUCP is to encourage compatibility between airports and the various land uses that surround them. In accordance with State law, Solano County (the County) has established an airport land use commission (ALUC) to prepare land use compatibility plans for the two public-use airports and one military airport[1] in the County, which includes Rio Vista Airport. The ALUC also reviews general plans and general plan amendments, proposed changes to zoning codes and ordinances, land use actions and development projects, and airport development plans for consistency with the compatibility policies contained in the current ALUCP for each airport.

[1] Travis Air Force Base, Nut Tree Airport, and Rio Vista Airport.



SOURCE: ESA, 2017; ESRI Mapping Services

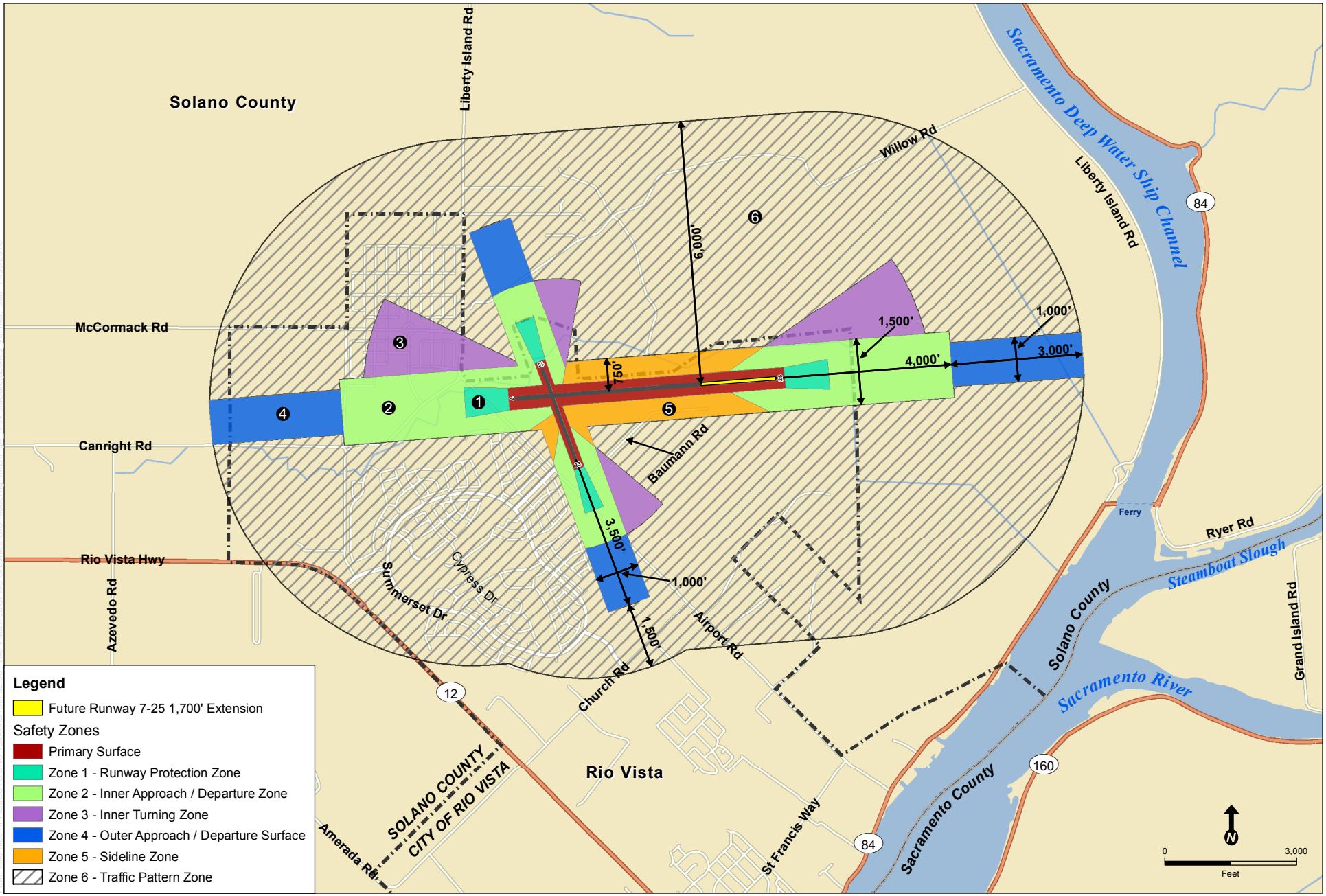
Rio Vista Municipal Airport ALUCP.150732

Figure 1

Regional Location

ESA

DRAFT FOR DELIBERATIVE PURPOSES ONLY



SOURCE: California Airport Land Use Planning Handbook, October 2011; ESA, 2016; ESRI Mapping Services

Rio Vista Municipal Airport ALUCP.150732

Figure 2

Safety Zones

ESA

DRAFT FOR DELIBERATIVE PURPOSES ONLY

2.1 Airport Land Use Commissions

Powers and Duties

ALUCs are established pursuant to State law 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 aircraft noise levels 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 and 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. The jurisdiction of an ALUC is restricted to new land uses; thus, 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 existing non-conforming land uses.

State law does not provide ALUCs with jurisdiction over airport operations, but ALUCPs must include assumptions about future operations for all airports that are covered by the ALUCP. Once adopted, an ALUCP provides ALUCs with the framework for reviewing significant proposals for further airport development.

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

3. Existing and Planned Facilities

Rio Vista Airport generally features helicopters and single-engine propeller, multi-engine propeller, and a few jet aircraft operations. For these operations, the Airport features two runways. Runway 7/25 generally runs east-west and is 4,199 feet long and 75 feet wide. Runway 15/33 generally runs north-south and is nearly half the length of Runway 7/25, at 2,199 feet long and 60 feet wide. The airfield elevation for Rio Vista Airport is 22.6 feet above mean sea level (MSL), and the Airport comprises approximately 273 acres.

4. Existing Operations

Annual operations at Rio Vista have decreased by approximately 22 percent, from 45,000 to 35,000 operations, since the adoption of the 1988 Rio Vista ALUCP. The 1988 Rio Vista ALUCP reported approximately 45,000 total annual operations, involving a breakdown of 74.9 percent

single-engine aircraft,15 percent agricultural aircraft, ten percent twin-engine aircraft, and 0.1 percent business jets for all fleet activity, with an average day total of 123 flights. The Airport currently averages 96 operations per day. The forecast condition in the 1988 Rio Vista ALUCP predicted a much greater and more diverse volume of traffic.120,000 total annual operations involving more specific concentration on single-engine aircraft traffic were forecasted, with a breakdown of 83.2 percent of single-engine aircraft, 5.6 percent agricultural aircraft, 11.1 percent twin-engine aircraft, and 0.1 percent business jets for all fleet activity.

5. Noise Modeling for Rio Vista Airport

For aircraft noise exposure calculations, aircraft operations associated with the annual-average day (AAD) are used in the Federal Aviation Administration (FAA) approved Aviation Environmental Design Tool (AEDT). **Table 1** provides 2015 and forecasted 2035 AAD operations by aircraft type, operation type (i.e., arrival, departure, touch-and-go), and time of day. Touch-and-go operations in the AEDT consist of an arrival and a departure. The number of touch-and-go operations at the Airport in 2015 was assumed to be 90% of local operations, which was then divided in half.

It should also be noted that FAA's Terminal Area Forecast (TAF) for the Airport indicates that the number of aircraft operations at the Airport in 2035 will be unchanged from the number of aircraft operations that occurred in 2015. For the purposes of developing aircraft noise contours for 2035, the Noise Modeling Assumptions Appendix, Appendix A, assumes that time of day, runway use, and flight track use in 2035 will also be unchanged from 2015. The primary difference between the existing conditions (2015) and future conditions (2035) scenarios involves the length of Runway 07-25. According to the Rio Vista Municipal Airport Layout Plan, May 2016, Runway 07-25 will be extended by approximately 1,700 feet to the east in the future.

The resulting 2015 and 2035 Community Noise Equivalent Level (CNEL) contours are presented in **Figures 3 and 4,** respectively.

6. 1988 Rio Vista ALUCP and Airport Land Use Planning Today

The following section describes the changes that have taken place in airport land use planning since the adoption of the 1988 Rio Vista ALUCP. As 29 years have passed since the last ALUCP was adopted, a number of efforts to streamline and more efficiently regulate airport land use in the state of California have taken place.

6.1 1988 ALUCP Adoption

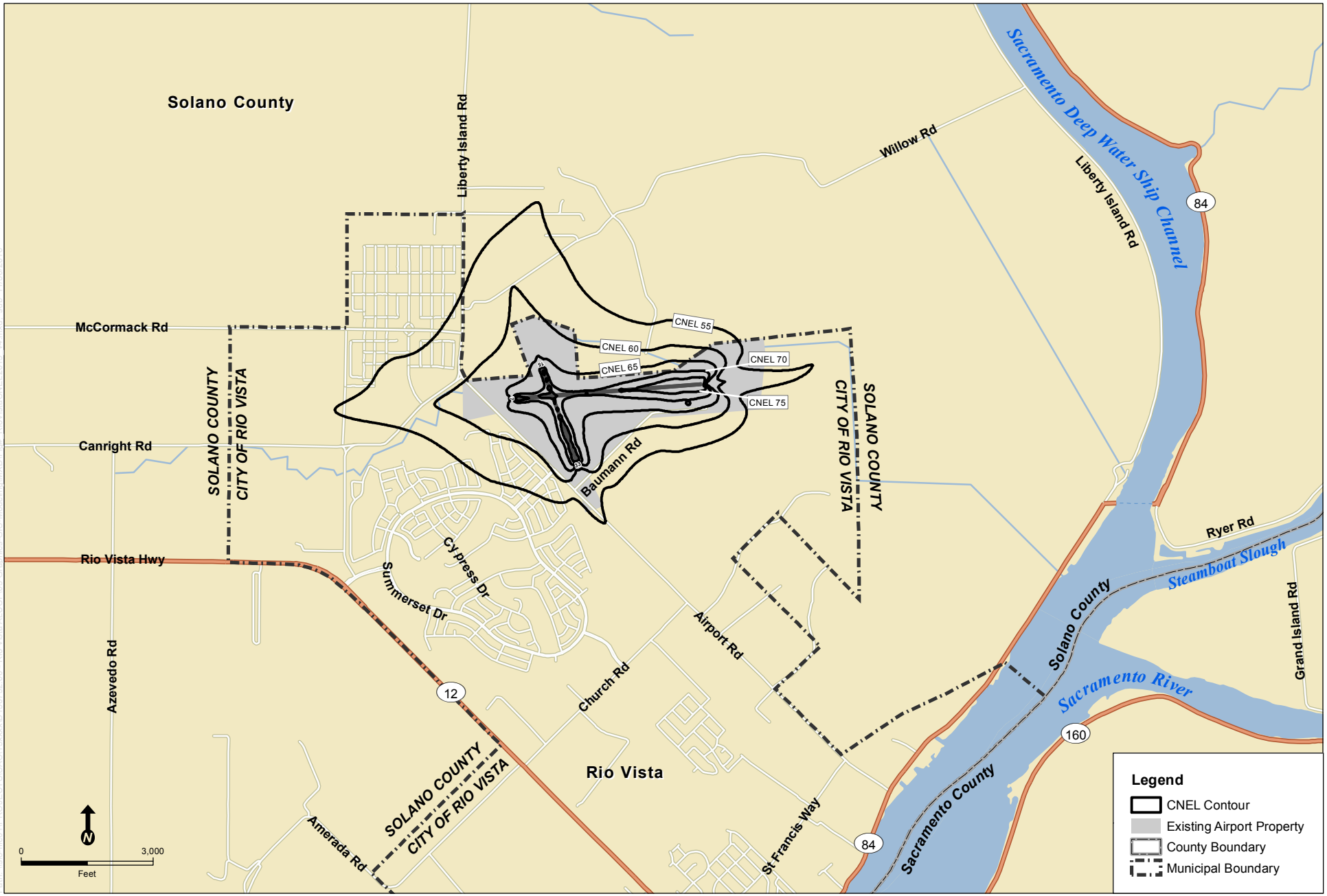
In May 1988, the Solano County ALUC adopted its most recent ALUCP (1988 Rio Vista ALUCP) for Rio Vista Airport. The 1988 Rio Vista ALUCP contained a number of key policy and planning changes that continued the regulation of land use within the vicinity of Rio Vista Airport. The 1988 Rio Vista ALUCP established the geographic scope and boundaries for land use compatibility actions, including the compatibility zones. The 1988 Rio Vista ALUCP

TABLE 1
ANNUAL AVERAGE DAY OPERATIONS – EXISTING (2015) AND FUTURE (2035) CONDITIONS

		Arrivals			Departures			Touch-and-Go Operations		
Aircraft Type	**INM Type**	**Day**	**Evening**	**Night**	**Day**	**Evening**	**Night**	**Day**	**Evening**	**Night**
Helicopter	B206L	1.18	0.12	0.02	1.18	0.12	0.02	0.00	0.00	0.00
Single-engine propeller	GASEPV	7.99	0.80	0.13	7.99	0.80	0.13	20.49	1.08	0.00
Single-engine propeller	GASEPF	4.44	0.45	0.07	4.44	0.45	0.07	0.00	0.00	0.00
Single-engine propeller	CNA172	1.77	0.18	0.03	1.77	0.18	0.03	0.00	0.00	0.00
Single-engine propeller	CNA206	1.77	0.18	0.03	1.77	0.18	0.03	0.00	0.00	0.00
Single-engine propeller	PA28	1.77	0.18	0.03	1.77	0.18	0.03	0.00	0.00	0.00
Multi-engine propeller	BEC58P	2.49	0.25	0.04	2.49	0.25	0.04	0.00	0.00	0.00
Multi-engine propeller	PA30	1.07	0.11	0.02	1.07	0.11	0.02	0.00	0.00	0.00
Jet	LEAR35	0.07	0.01	0.00	0.07	0.01	0.00	0.00	0.00	0.00
Jet	CNA500	0.05	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00
	Total	**22.60**	**2.28**	**0.37**	**22.60**	**2.28**	**0.37**	**20.49**	**1.08**	**0.00**

NOTE:
In the AEDT, a touch-and-go operation consists of an arrival and a departure. Touch and go operations were divided by two to calculate the number of touch-and-go operations at Rio Vista Airport.

SOURCES: ESA, 2016, based on aircraft operation information included in the 1988 ALUCP. FAA TAF, 2016.



NOTE: CNEL = Community Noise Equivalent Level.

SOURCE: AEDT 2c SP3; ESA, 2016; ESRI Mapping Services

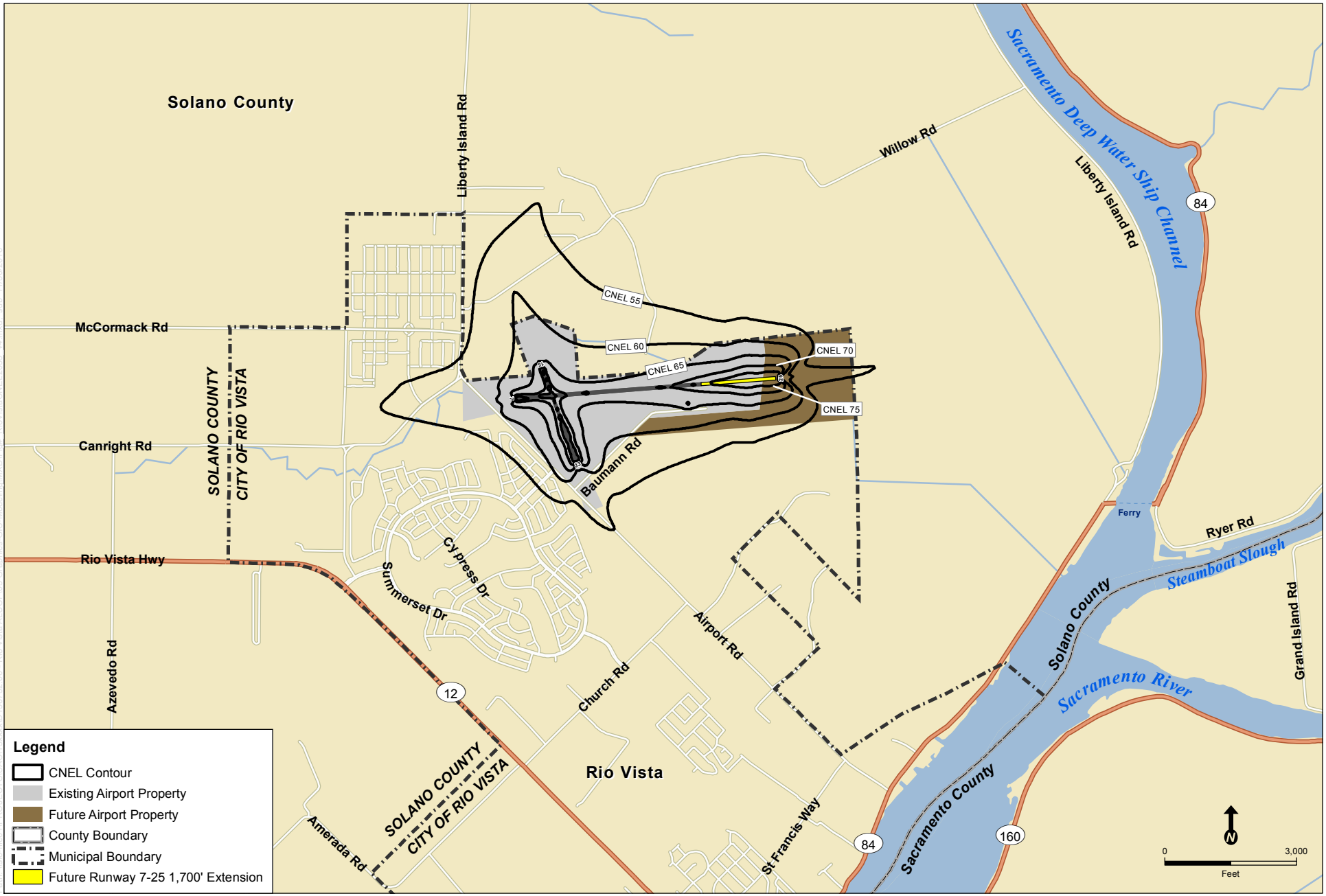
Rio Vista Municipal Airport ALUCP.150732

Figure 3

2015 Noise Contours

ESA

DRAFT FOR DELIBERATIVE PURPOSES ONLY



NOTE: CNEL = Community Noise Equivalent Level.

SOURCE: AEDT 2c SP3; ESA, 2016; ESRI Mapping Services

Rio Vista Municipal Airport ALUCP.150732

Figure 4

2035 Noise Contours

ESA

DRAFT FOR DELIBERATIVE PURPOSES ONLY

contains Compatibility Zones A, B, C, D, E, and F; these zones were also defined and delineated in the ALUCP as the geographic area of concern. Overall, the compatibility zones included a large portion of the City of Rio Vista, along with some unincorporated areas within Solano County. **Figure 5** provides the compatibility zones presented in the 1988 ALUCP.

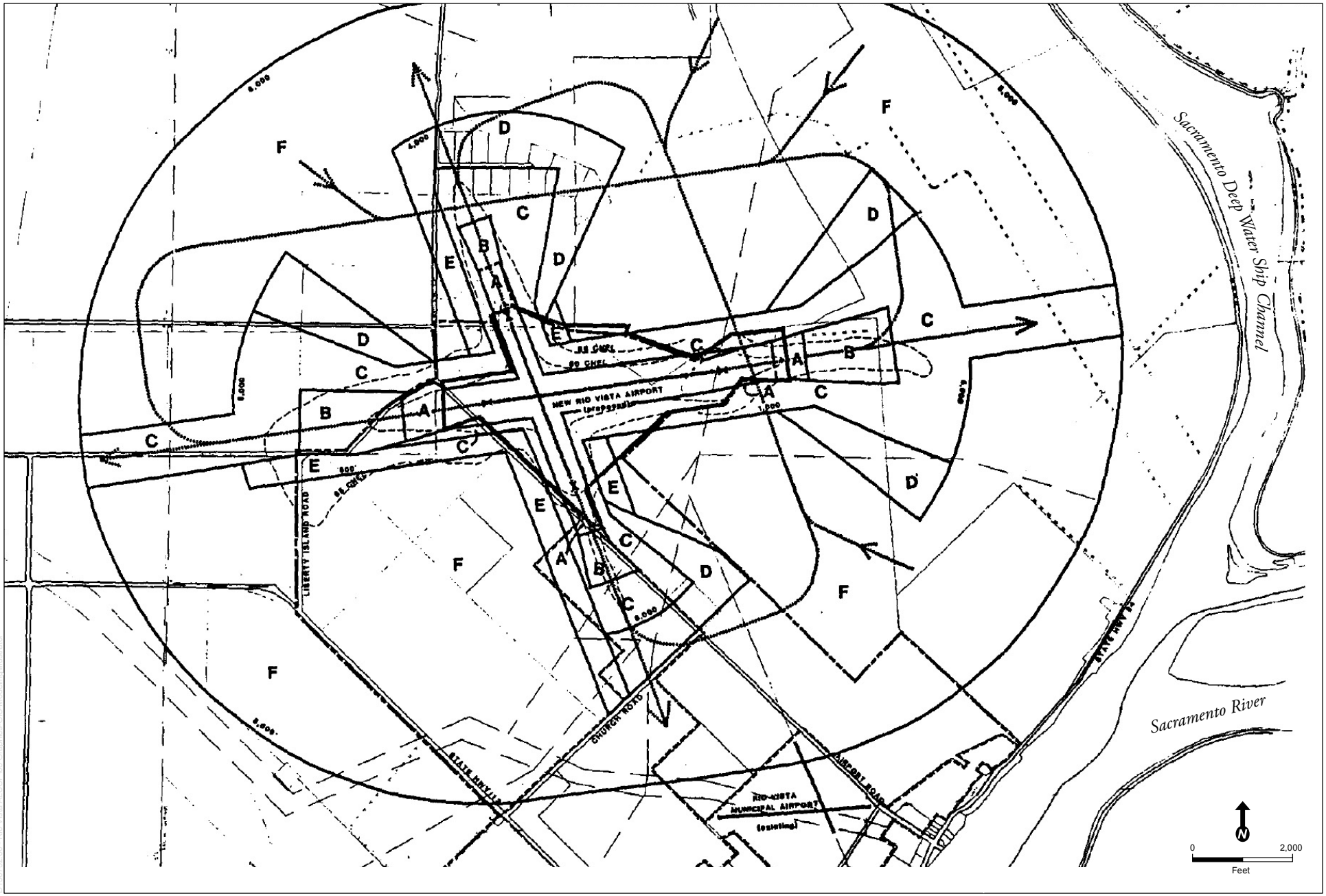
The 1988 Rio Vista ALUCP also includes a basic compatibility table to apply to the review of proposed land use actions in the vicinity of the Airport and also within the specific compatibility zones. This table represents a combination of noise, safety, airspace protection and overflight compatibility criteria for Rio Vista Airport, which was largely intended to suffice for any review of proposed land use amendments from the County and City jurisdictions. Through these criteria and subsequent policies, the Rio Vista ALUCP defines the allowance for residential and non-residential uses, along with prohibited uses, for the various compatibility zones.

The aircraft noise exposure levels, as with the other supporting criteria of the ALUCP Compatibility Policies, were based on future projections of activity at Rio Vista Airport. The ALUCP presents predicted aircraft noise exposure levels, based on projected flight operations data, and determines appropriate noise exposure levels for residential and non-residential uses, and also establishes appropriate interior noise levels.

For safety, land uses are largely examined based on the level of risk to people on the ground, in addition to the presence of any fuel or other hazardous materials within the given compatibility zones. Specific levels of clustering of people based on non-residential uses were established for the compatibility zones. For airspace protection, the ALUCP created height restrictions that were based on the 14 CFR Part 77 guidelines, titled *Objects Affecting Navigable Airspace*. For existing and nonconforming obstructions, the Federal Aviation Administration (FAA) is required to review and assess appropriate lighting and marking conditions and strategies. For matters pertaining to overflight, the ALUCP recognized that although a buyer notification program could not be fully enforced, Solano ALUC could sponsor efforts by real estate agencies to inform potential homebuyers of overflight issues in affected areas.

6.2 Changes in Airport Land Use Planning Since 1988

Since the adoption of the 1988 Rio Vista ALUCP, the standards and requirements for airport land use planning have become more streamlined and consolidated while aiming to maintain the optimum level of detail and emphasis on ensuring land use compatibility. A series of versions of the Handbook have been made over the past four decades – in 1983, 1993, 2002, and 2011. For instance, the 2011 Handbook reduced the number of chapters to six from the nine that were in its 1983 edition and penultimate 2002 edition. Chapter 4 of the 2011 Handbook consolidates information in Chapters 3, 7, and 9 of the 2002 edition to better focus a discussion on how best to develop and implement airport land use compatibility policies to better connect with the goals pertaining to noise, overflight, safety, and airspace protection policies for each unique airport setting. Overall, much of the 2011 Handbook shares some similarities with the 1983 edition, but with the increase in versions and revisions over the years the Handbook has evolved into a more simplified and streamlined document.



SOURCE: Solano County Airport Land Use Commission, April 1988

Rio Vista Municipal Airport ALUCP . 150732

Figure 5

1988 ALUCP Compatibility Zones

ESA

DRAFT FOR DELIBERATIVE PURPOSES ONLY

The updated Rio Vista ALUCP is primarily needed for the following three reasons:

- To address compatibility issues associated with the proliferation of renewable energy projects in Solano County.
- To merge the Rio Vista ALUCP with the countywide policies contained in the *Solano County Airport Land Use Compatibility Review Procedures* document.
- To update the current LUCP, as appropriate, pursuant to the standards set forth in Caltrans' 2011 *California Airport Land Use Planning Handbook*.

Portions of the 1988 Rio Vista Airport ALUCP are out-of-date and/or are inconsistent with guidance presented in the 2011 Handbook. **Table 2** provides comparisons between the policies in the 1988 ALUCP and the 2011 Handbook. In some cases, the 2011 Handbook provides more lenient guidance on certain criteria. The ALUC may choose to keep its stricter policies, for the 2011 Handbook does not describe any maximum requirements for guidance, but only minimum requirements.

In addition, the 2011 Handbook recommends establishing separations between public airports (or military airfields) and wildlife attractants, which are delineated by FAA Advisory Circular 150/5200-33B, titled "Hazardous Wildlife Attractants On or Near Airports," (August 2007). In this circular, the FAA provides guidance for airport operators and parties assuming guidance of airports and airfields to minimize the risks that certain wildlife species pose to aircraft, which primarily focuses on creating a Wildlife Hazard Analysis (WHA) Boundary, to prevent aircraft collisions with birds and other wildlife. A WHA Boundary was not included in the 1988 Rio Vista ALUCP.

Figure 6 provides a WHA Boundary for Rio Vista Airport. Based on the fact that Rio Vista Airport serves piston-powered aircraft, the FAA's Perimeter A (instead of the larger Perimeter B for airports serving turbine-powered aircraft) has been delineated, and this perimeter requires that hazardous wildlife attractants must be 5,000 feet from the nearest air operations area (AOA). In general, waste disposal operations, water management facilities, wetlands, dredge spoil containment areas, agricultural activities, golf courses, and major landscaping operations are discouraged within Perimeter A.

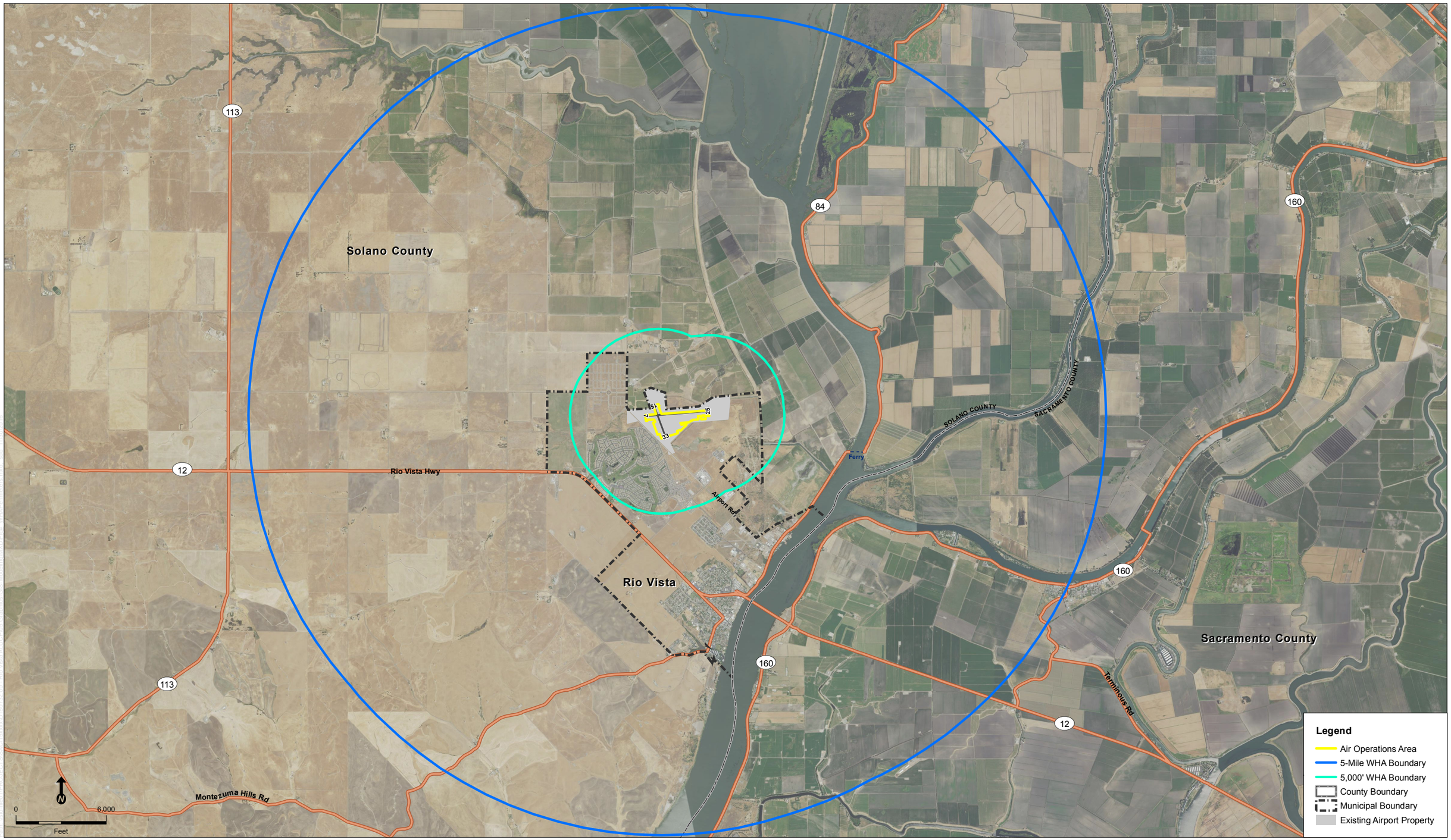
Perimeter C is an additional boundary, providing a five-mile range to protect the approach, departure, and circling airspace functions at the Airport. The FAA considers Perimeter C an additional sensitive aircraft operating area, and, as such, development plans, proposed land-use changes, or new wetland mitigation plans changes must be evaluated by an FAA-qualified wildlife hazard biologist in accordance with FAA Advisory Circular 150/5200-33B to ensure they do not present potential wildlife hazards to aircraft operations at Rio Vista Airport.

As stated in the Advisory Circular, most airports have large tracts of open, undeveloped land that provide added margins of safety and noise mitigation. If these areas encourage wildlife to enter an airport's approach or departure airspace or air operations area, risks of aircraft collisions with wildlife could increase. Constructed or natural areas—such as poorly drained locations, detention/ retention ponds, roosting habitats on buildings, landscaping, odor causing rotting organic matter (putrescible waste) disposal operations, wastewater treatment plants, agricultural or aquaculture activities, surface mining, or wetlands—can provide wildlife with ideal locations for feeding,

TABLE 2
COMPARISON OF COMPATIBILITY POLICIES BETWEEN RIO VISTA'S 1988 AIRPORT LAND USE COMPATIBILITY PLAN AND THE 2011 CALIFORNIA AIRPORT LAND USE PLANNING HANDBOOK

Compatibility Factor	1988 Rio Vista ALUCP	2011 Handbook
Noise	Residential or other noise sensitive uses are compatible in areas where noise is less than CNEL 60 dB, and the ALUCP also indicates that compatible noise levels for other types of land uses shall be consistent with the above residential area noise level criteria.	This policy is generally as restrictive as the 2011 Handbook, which suggests 60 dB is appropriate for new residential development around airports in urban/suburban surroundings. However, additional refinement of non-residential land use compatibility, based on noise, is also provided.
Safety	The 1988 ALUCP does not offer standards on the 2011 Handbook 1-6 zone scale, but rather categorizes zones as A, B, C, D, E, and F. The zones provided in the 1988 ALUCP do not correspond to the zones provided in the 2011 Handbook, and further, flight patterns have changed at the Airport to account for new development, additionally redefining zone dimensions. The 1988 ALUCP establishes the following density and intensity standards for nonresidential and residential uses (measured in terms of people per acre): Zone A: • Max. Residential Densities: 0 • Max. people in structures: 10 • Max. people in and out of structures: 15 Zone B: • Max. Residential Densities: 0.3 • Max. people in structures: 20 • Max. people in and out of structures: 40 Zone C: • Max. Residential Densities: 1 • Max. people in structures: 50 • Max. people in and out of structures: 75 Zone D: • Max. Residential Densities: 4 • Max. people in structures: 100 • Max. people in and out of structures: 150 Zone E: • Max. Residential Densities: 6 • Max. people in structures: n/a • Max. people in and out of structures: n/a Zone F: • Max. Residential Densities: n/a • Max. people in structures: n/a • Max. people in and out of structures: n/a	The 1988 ALUCP provides stricter protection measures. The 2011 Handbook recommends a range of intensity and density standards for nonresidential and residential uses. For an airport in an suburban environment, the 2011 Handbook recommends the following (measured in terms of people per acre): Zone 1: • Max. Residential Densities: 0 • Max. Nonresidential Intensities: 0 • Max. Single Acre: 0 Zone 2: • Max. Residential Densities: 0 • Max. Nonresidential Intensities:40-60 • Max. Single Acre: 80-120 Zone 3: • Max. Residential Densities: Infill • Max. Nonresidential Intensities: 70-100 • Max. Single Acre: 210-300 Zone 4: • Max. Residential Densities: Infill • Max. Nonresidential Intensities: 100-150 • Max. Single Acre: 300-450 Zone 5: • Max. Residential Densities: Infill • Max. Nonresidential Intensities: 70-100 • Max. Single Acre: 210-300 Zone 6: • Max. Residential Densities: No limit • Max. Nonresidential Intensities: 200-300 • Max. Single Acre: 800-1,200
Airspace Protection	The 1988 Rio Vista ALUCP follows the 14 CFR Part 77 guidelines for height restrictions and also establishes the following criteria for the ALUC review of the height of proposed objects, within the compatibility zones, as follows: Zones A through C: All structures, trees and other objects shall be required to meet airport height limits unless it can be conclusively shown that the property cannot be reasonably utilized without violating the standards and that a lesser degree of violation cannot be reasonably achieved.	The 2011 Handbook follows the guidelines established by 14 CFR Part 77. In addition, the Handbook recommends consideration for other airspace hazards, such as wildlife, which are not discussed in the 1988 Rio Vista ALUCP, and recommends separations between an airport and wildlife attractants as delineated in FAA Advisory Circular 150/5200-33B "Hazardous Wildlife Attractants On or Near Airports".
Overflight	The 1988 Rio Vista ALUCP does contain avigation easement requirements for the stated purpose of informing land owners in the vicinity of the Airport that they will be exposed to aircraft-related noise. In addition, the Rio Vista ALUCP also encourages local governments to establish a "buyer notification statement" as a requirement for the transfer of title of any property located within the Airport's geographic area of concern.	The 2011 Handbook recommends overflight compatibility measures that do not grant rights to the airport proprietor, such as an easement. The 2011 Handbook recommends notification methods; specifically recorded deed notices and buyer awareness measures. The latter is required per the Business and Professions Code Sections 11010(a) and (b)(13).

SOURCES: Solano County, 1988. Rio Vista Airport: Airport Land Use Compatibility Plan. May; Caltrans, *California Airport Land Use Planning Handbook*, 2011.



SOURCE: ESA, 2016; ESRI Mapping Services

Rio Vista Municipal Airport ALUCP.150732

Figure 6

Wildlife Hazard Analysis Boundaries

ESA

DRAFT FOR DELIBERATIVE PURPOSES ONLY

loafing, reproduction, and escape. Even small facilities, such as fast food restaurants, taxicab staging areas, rental car facilities, aircraft viewing areas, and public parks, can produce substantial attractions for hazardous wildlife. With the WHA Boundary in place, there could be potential impacts to agricultural mitigation or wetland mitigation banking that would require additional review from the ALUC. In order to minimize wildlife risks to aircraft and human safety, the ALUC could consider including this strategy from the 2011 Handbook in the development of the Rio Vista ALUCP.

7. Sample 2011 Handbook Compatibility Criteria

Table 3 describes the compatibility criteria that are presented in the 2011 Handbook.

TABLE 3
COMPATIBILITY CRITERIA WITHIN THE 2011 CALIFORNIA AIRPORT LAND USE PLANNING HANDBOOK

Compatibility Factor	2011 Handbook Criteria
Noise	The FAR Part 150 Airport Noise Compatibility Planning criteria establish voluntary program requirements for airports to utilize. The AICUZ program prepares military air base requirements for noise compatibility criteria that suggest acoustical treatments above 65 dB Day-Night Average Sound Level (DNL). Based on the 65 community noise equivalent level (CNEL), four land uses have been defined as incompatible: • Residences of all types; • Public and private schools; • Hospitals and convalescent homes; and • Churches, synagogues, and other places of worship. The standards within the California Building Code (California Code of Regulations, Title 24) state that no habitable room shall have interior noise levels attributable to exterior noise sources exceeding 45 dB.
Overflight	The 2011 Handbook recommends utilizing noise contours, flight tracks, and even noise complaint patterns to delineate appropriate overflight boundaries. Flight track data are seen to be the most accurate means of determining overflight zones because these data depict both the location and altitude of aircraft operations. If not available, as is common in some smaller airports, the standard operating procedures of the particular airport can provide the best understanding of overflight boundaries.
Safety	The 2011 Handbook recommends a range of intensity and density standards for nonresidential and residential uses. For an airport in an urban environment, the 2011 Handbook recommends the following six zones generically: • Zone 1: Runway protection zone and within runway object free area adjacent to the runway; • Zone 2: Inner approach/departure zone; • Zone 3: Inner turning zone; • Zone 4: Outer approach/departure zone; • Zone 5: Sideline zone; and • Zone 6: Traffic pattern zone (not applicable to large air carrier airports).
Airspace Protection	The FAA has established the14 CFR Part 77 Airspace Surfaces to determine and protect navigable airspace from obstructions and other hazards in the vicinity to airports. Subpart C, Obstruction Standards, of 14 CFR Part 77 presents the standards used to determine obstructions to air navigation.

SOURCE: Caltrans, California Airport Land Use Planning Handbook, 2011.

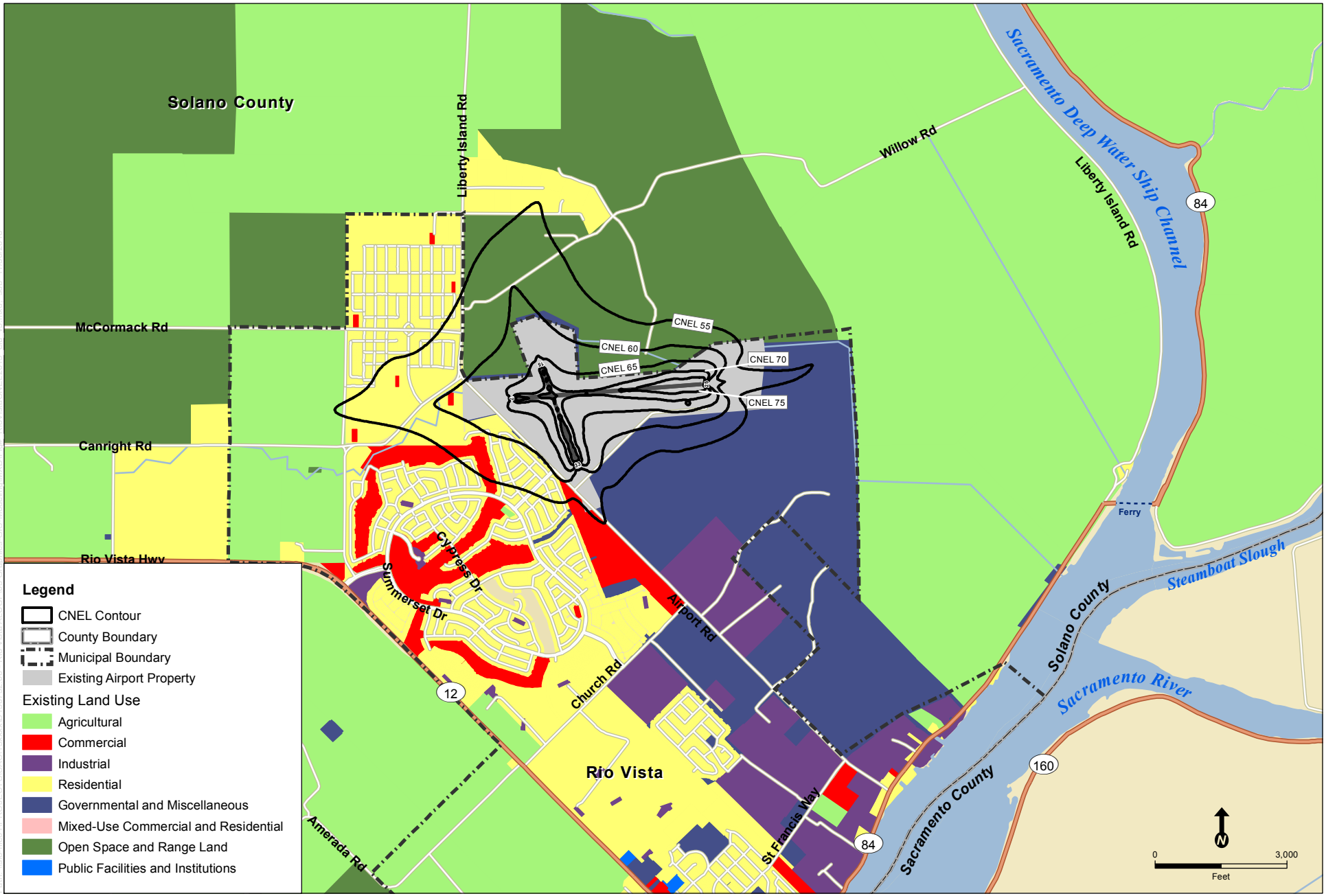
8. Changes in Operations at Rio Vista Airport

There is limited information regarding the historic levels of aircraft operations at Rio Vista Airport. When comparing the 1988 ALUCP and FAA Terminal Area Forecast (TAF) data, the 1988 ALUCP provides an annual aircraft operations count of approximately 45,000 while the TAF data provides 17,150 operations annually for the years 1990 to 1993, 0 operations in1994 or 1995, and 35,000 operations every year from 1996 to 2015. At the time of the 1988 ALUCP, Rio Vista Airport was operating at its original location, which was closer to the center of Rio Vista and about 1.35 miles to the southeast of the current ("new") Airport, southwest of the corner of Airport Road and Saint Francis Way. In 1993, the new (and current) Airport location opened, with the original Airport closing in 1995 after nearly 40 years in operation. While the 1988 ALUCP predicted approximately 120,000 annual aircraft operations upon buildout of facilities and runways at the new Airport location, the TAF data indicates a far more conservative estimate of 35,000 operations in 2035, remaining unchanged from the 2015 data.

9. Existing and Planned Land Uses and Zoning in the Vicinity of the Safety Zones

The purpose of this section is to characterize the environment and land uses surrounding Rio Vista Airport. The Airport is located primarily within the City of Rio Vista, but its operations affect several areas within unincorporated Solano County. Further, lands to the north of the Airport are located in unincorporated Solano County, as the Airport serves as a northern border for portions of Rio Vista. **Figure 7** demonstrates 2015 aircraft operations alongside existing land use in the Airport and its vicinity. **Figure 8** provides 2035 forecast aircraft operations alongside planned land use in the Airport and its vicinity. The following discussion describes the existing and planned land uses and zoning in the jurisdictions within and surrounding Rio Vista Airport.

As seen in Figure 1, Rio Vista Airport is located in the greater Sacramento-San Joaquin River Delta region, approximately 27 miles southwest of the City of Sacramento and 46 miles northeast of the City of San Francisco. The Airport is approximately two miles to the west of the Sacramento River, and is also located approximately 16 miles west of Interstate 5. The Airport is primarily accessed via Airport Road. Airport Road runs east-west along the southern boundary of the Airport and intersects Baumann Road, which provides direct access to the administration building, hangars, and other facilities on the southern side of the Airport. The northern and eastern sides of the Airport are surrounded by waterways, and road access is provided by a private perimeter road.



SOURCE: AEDT 2c SP3; ESA, 2016; Solano County GIS Department, 2016; ESRI Mapping Services

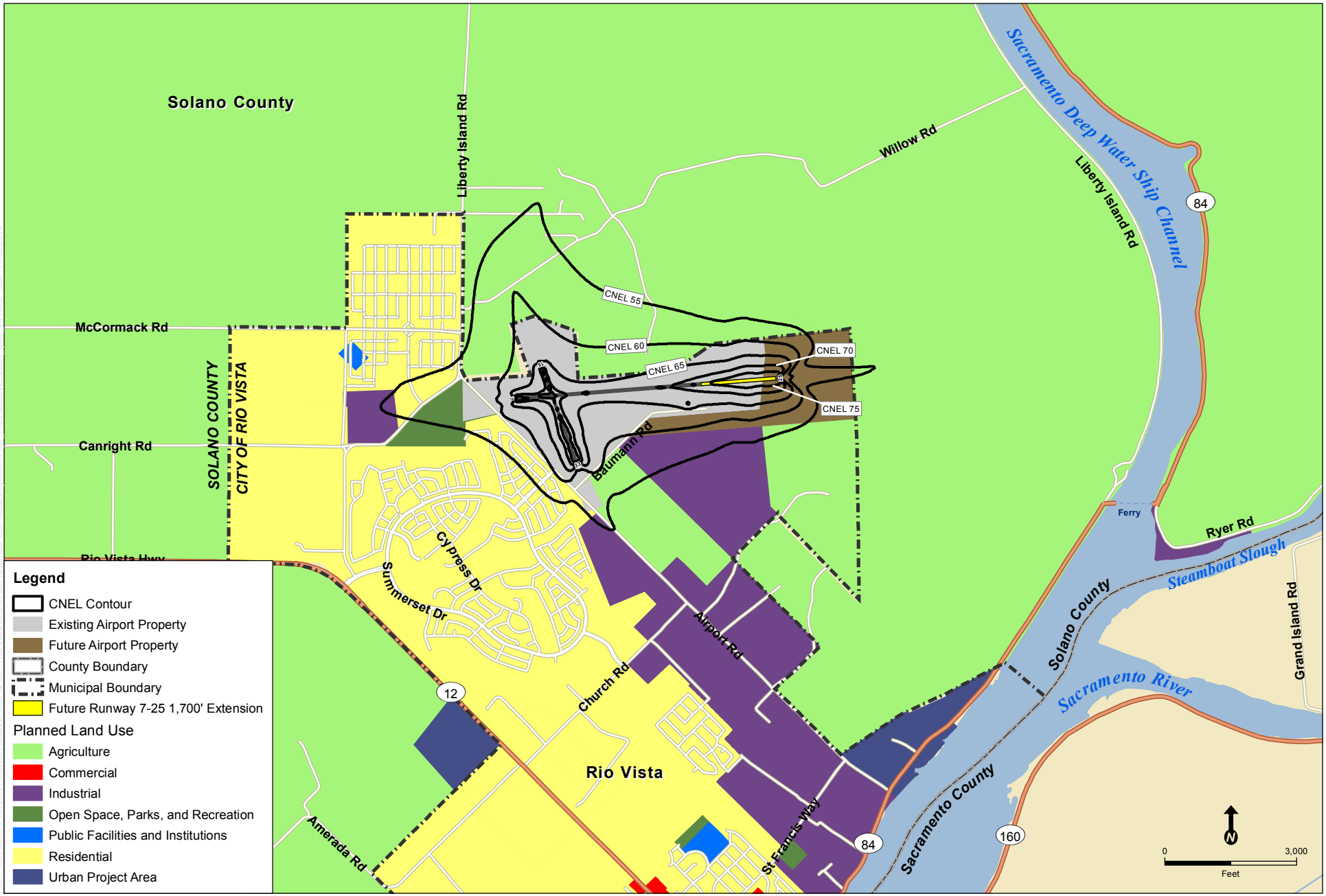
Rio Vista Municipal Airport ALUCP.150732

Figure 7

2015 CNEL Contours and Existing Land Use

ESA

DRAFT FOR DELIBERATIVE PURPOSES ONLY



NOTE: CNEL = Community Noise Equivalent Level.

SOURCE: AEDT 2c SP3; ESA, 2016; Solano County GIS Department, 2016; ESRI Mapping Services

Rio Vista Municipal Airport ALUCP.150732

Figure 8

2035 CNEL Contours and General Plan Land Use

ESA

DRAFT FOR DELIBERATIVE PURPOSES ONLY

9.1 City of Rio Vista

The City of Rio Vista is approximately 6.7 square miles and contains Rio Vista Airport.

Existing Land Uses

Existing land uses within the City of Rio Vista located closest to the Airport include primarily residential uses to the west, open space to the north, and industrial uses to the east and south. A small area of commercial land use lies to the south of Runway 33 along its extended centerline. Additionally, Rio Vista Airport is located along the northern boundary of the Rio Vista city limits. The southwestern and central areas of the City are largely undeveloped as well, though the southeastern and eastern portions of the City, facing the Sacramento River largely contain residential and commercial uses.

Planned Land Uses

Planned land use designations for the City of Rio Vista are established in the City's General Plan. Portions of the City to the west and northwest are predominantly designated as residential and agricultural, along with Rio Vista Airport. Agricultural uses are also in the southwest of the City. The northeastern portion of the City features mostly industrial uses, while the southeastern Downtown area contains a mixture of neighborhood residential, historic residential, highway commercial, and downtown waterfront uses.

Specific Plans

The Waterfront Specific Plan comprises approximately 15 acres and is bounded by Main Street on the South, SR 12 on the north, and the Sacramento River on the east. The project area envisions more walkable streets that better integrate with the City's Waterfront and provide ample public open space, culminating in two neighborhood concepts. While both involve public and civic spaces that are readily accessible for pedestrians, Concept A seeks more of a focus on residential uses whereas Concept B aims to create a more mixed-use neighborhood replete with a strong retail and commercial focus. The Waterfront Specific Plan area is located just over two miles from the Airport and will not be affected by Airport operations.

Zoning

Zoning designations for the City of Rio Vista are established in Title 17 of the City's Municipal Code. Portions of the City to the west and southwest are predominantly designated as single-family residential, whereas portions to the east and northeast are designated as almost exclusively industrial.

9.2 Solano County

Solano County covers an area of approximately 829 square miles and is located between Sacramento County to the east, Yolo County to the north, Contra Costa County to the south, and the Counties of Napa and Sonoma and San Pablo Bay to the west.

Existing Land Uses

The environs surrounding Rio Vista Airport consist of incorporated areas only to the west; the Airport is located within the Rio Vista city limit but unincorporated parts of Solano County surround the Airport along its northern and western boundaries, and these areas are largely agricultural uses in the safety zones.

Planned Land Uses

General Plan land use designations throughout nearly portions of unincorporated Solano County located closest to the Airport generally reflect the development pattern of existing land uses, which involve agricultural uses. To the south, leading to Grizzly Bay, Suisun Bay, and Honker Bay is a large amount of land designated as marsh, which primarily relates to the existing conditions at Suisun Marsh. Land to the north is primarily designated as industrial with minimal residential uses (in Fairfield); however, north of the Fairfield city limit, there is also an agricultural buffer between Fairfield and Vacaville, the Vacaville-Fairfield-Solano Greenbelt. To the west, the jurisdictions of Fairfield and Suisun City feature mainly residential uses.

Specific Plans

The Middle Green Valley Specific Plan Area (Plan Area) is located approximately 24 miles to the west of the Airport on Green Valley Road, in unincorporated Green Valley, near the western boundary of Solano County; north of I-80, Jameson Canyon, and the Hidden Meadows subdivision (City of Fairfield); south of existing unincorporated subdivisions and the Green Valley Country Club in upper Green Valley; west of Suisun Valley and the Rockville Hills; and northwest of the Eastridge subdivision (City of Fairfield).

The Middle Green Valley Special Study Area (SSA) is approximately 1,905 acres of land in the western portions of Solano County. The major roads serving the Plan Area are Green Valley Road and Rockville Road (to the north). A number of smaller country roads and unpaved two lane roads exist within the Plan Area as well. The most prominent are Terminal Reservoir Road along the southern boundary and Mason Road which runs east-west in the more central area of the site.

The site will contain a mixture of open space, agricultural, and rural residential zoning. The residential standards are as follows:

- Rural Farm – (RF): This designation allows for single family residences on 1 to 5 acre parcels. Reference: Section 28-23 Rural Residential (RR-5, RR-2.5) and Residential Estate (RE-1) Districts.

- Rural Meadow - (RM): This designation allows for single family residential development at densities of 1-4 dwelling units per acre. These residential areas are organized around meadow features in the foothill areas to respond to topography and oak woodlands.

- Rural Neighborhood– (RN): This designation allows for primarily residential development at densities of 1-4 dwelling units per acre. Reference: Section 28-24 Suburban Residential Districts (R-E-1, R-E-1/2, R-E-1/4) Districts

- Rural Mixed–Use Center – (RC): This designation allows for residential development at densities of 4-8 dwelling units per acre with opportunities for neighborhood commercial/ office in lower or partial floors. This designation allows for a flexible residential/mixed use setting to provide small business and retail opportunities that support and service the community and neighboring regions.

Zoning

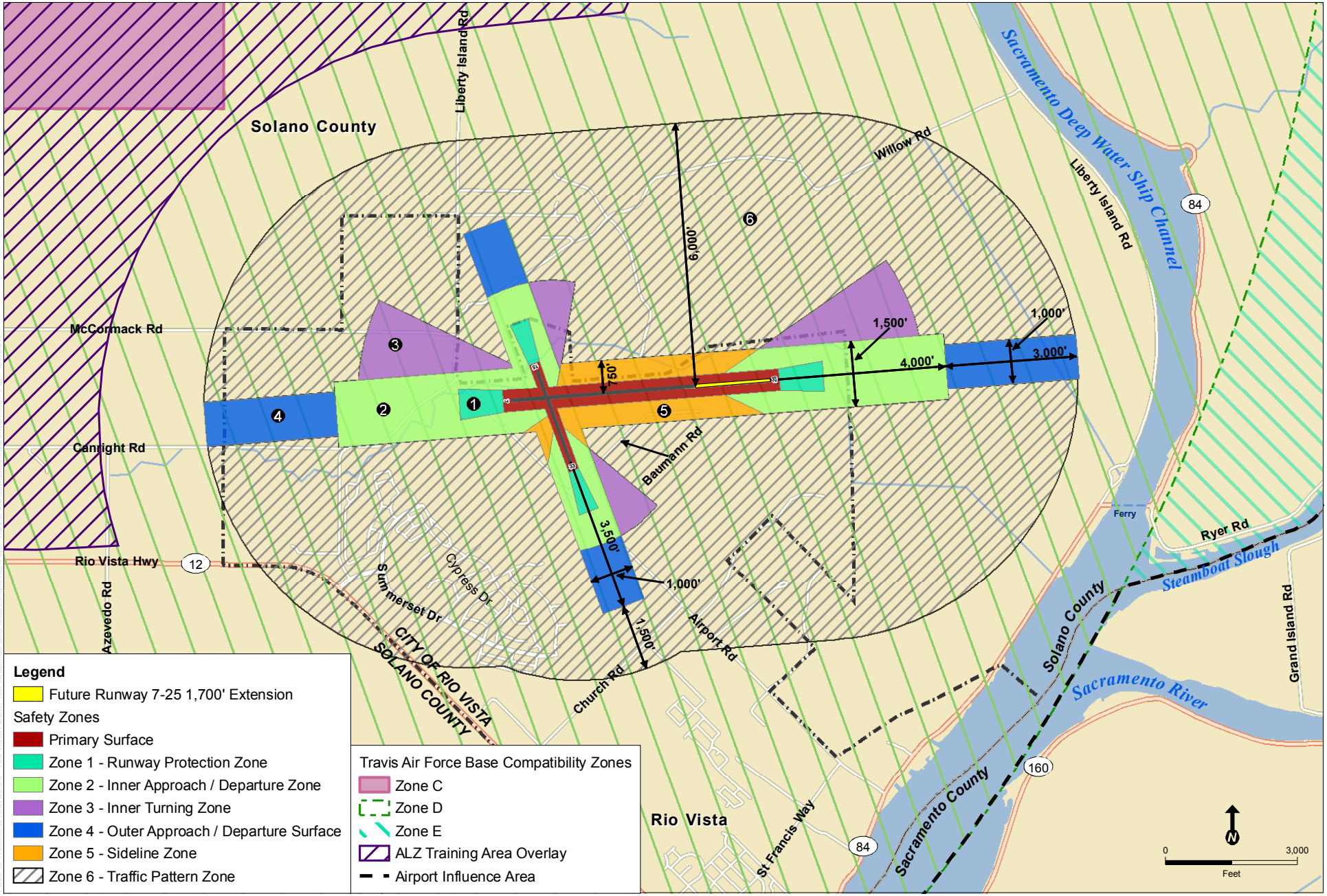
Zoning designations in unincorporated Solano County are found in Chapter 28 of the County's Zoning regulations. For the most part, the eastern half of the County is almost entirely zoned as agriculture, with the northwestern corner of the County along the Vaca Mountains, and a large southern portion of the County designated as an open space zone (facing Grizzly Bay). Otherwise, there are some single-family residential zones that surround a northern portion of Vacaville and also a northwestern portion of Fairfield.

In particular, Solano County has adopted the Travis Reserve Area (TRA) overlay designation to protect the land within the overlay for continued agriculture, grazing and associated habitat uses until a military or airport use is proposed. No residential uses are permitted in this overlay zone. This designation enables the future expansion of Travis Air Force Base (AFB) and additional support facilities for the Air Force Base. If the status of the Air Force Base changes, the construction of non-military airport and support uses may also be permitted (Solano County, 2008). However, this designation does not affect Rio Vista Airport.

Lastly, Rio Vista Airport and its immediate surroundings are located within Compatibility Zone D of Travis Air Force Base's Land Use Compatibility Plan (LUCP), which requires the following:

- ALUC review for all new objects greater than 200 feet above ground level (AGL) in height;
- ALUC review that entails a Solar Glare Hazard Analysis Tool (SGHAT) glint and glare study for all new or expanded commercial-scale solar facilities;
- ALUC review involving appropriate line-of-sight standards for all proposed wind turbine facilities.
- Apart from the above restrictions, there are no density or intensity limits, although large stadiums and similar uses should be avoided.

Figure 9 depicts the Travis AFB compatibility zones within the Rio Vista area, based on the Travis AFB LUCP. It is understood that Rio Vista Airport features additional restrictions for development because of its location within the Travis Air Force Base compatibility zones. While tall noncompliant structures would not be permitted within the existing and proposed (if adopted) Rio Vista Airport compatibility zones, all future development projects in the area would be required to adhere to both the less restrictive Travis AFB compatibility zones within Rio Vista and the Rio Vista Airport safety zones, of which a range of restrictions exist. Review would occur through the same agency, the Solano County ALUC. As a result, while there is some interaction between the Airport and the Travis Air Force Base LUCP compatibility zones, there are no conflicts with the requirements already established in the Rio Vista ALUCP.



SOURCE: California Airport Land Use Planning Handbook, October 2011; Mead & Hunt, 2015; Travis AFB, 2014; ESA, 2017; ESRI Mapping Services

Rio Vista Municipal Airport ALUCP.150732

Figure 9

Travis Air Force Base and Rio Vista Airport Compatibility Zones

ESA

DRAFT FOR DELIBERATIVE PURPOSES ONLY

10. Potential Conflicts between the New LUCP and Planned Land Uses

The following section analyzes the potential noise, airspace protection, safety, and overflight conflicts that may emerge between the new ALUCP and planned land uses and zoning found in the vicinity of the Airport. As of this white paper's writing, the zoning for Rio Vista and Solano County should be consistent with the planned land uses. To begin each section, an overview of these four criteria, as explained in the 2011 Handbook provides clarification for the technical analysis that follows. Additionally, Subsection 9.1 only involves a discussion of potential noise conflicts, while Subsection 9.2 consolidates the analysis of potential airspace protection, safety, and overflight conflicts together.

10.1 Potential Noise Conflicts

According to the 2011 Handbook, the main strategy for achieving noise compatibility in the vicinity of an airport involves preventing or minimizing the development of land uses that are particularly sensitive to noise. Typically, land use strategies include ones that either involve fewer people or generate significant noise levels on site. Regarding residential noise in particular, the 2011 Handbook indicates three CNEL values to commonly use as the limit for acceptable residential noise exposure are: 65 dB, 60 dB, or 55 dB. Additionally, interior noise has emerged as another broadly suitable land use compatibility measure when dealing with highly noise-impacted locations. As mentioned earlier, Figure 4 presents the noise contours based on the 2035 forecast aircraft operations at the Airport, Figure 7 depicts 2015 existing aircraft CNEL contours over the existing land use and Figure 8 depicts the 2035 forecast aircraft CNEL contours over planned land use. These are the maps for which this section bases its analysis.

As part of this ALUCP, 2035 operations and fleet mix for Rio Vista Airport were used to develop future CNEL contours. As described in Section 5, Noise Modeling for Rio Vista Airport, this process involved estimating the future aircraft operations, fleet mix, runway use, and flight tracks use at the Airport to determine the aircraft noise exposures levels for the 20-year forecast period.

Potential Conflicts from Planned Land Uses

There are no conflicts with the planned land uses within the City of Rio Vista or Solano County as neither jurisdiction contains any residential land uses located within any contours greater than 60 CNEL. Planned uses within the 60 CNEL contour include agriculture and industrial land uses. These portions of land that fall within the 60 CNEL contour would have to adhere to nonresidential noise standards per the 2011 Handbook.

10.2 Potential Airspace Protection, Safety, and Overflight Conflicts

As mentioned earlier, although the Airport is located within Compatibility Zone D of the Travis AFB, no activities, development, or changes to the Rio Vista ALUCP are affected or precluded.

Airspace Protection

The 2011 Handbook presents two relatively simple compatibility strategies to assist airports and airfields in dealing with the protection of airspace, based on the following two sets 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 that may create other types of hazards to flight near an airport should be avoided or modified so as not to include the offending characteristic.

Airspace protection focuses primarily on clearing the obstructions to the airspace required for flight to, from, and around an airport, preventing bird strikes and collisions with other wildlife hazards, and removing any other types of interference with safe flight, navigation, or communication. **Figure 10** provides a map containing the 14 CFR Part 77 surfaces for the Airport including the extension of Runway 7/25.

Safety

For issues of safety and overflight, the following Compatibility Zones—1, 2, 3, 4, 5, and 6—feature specific delineations and have varying regulations on the development of land surrounding the Airport, including but not limited to restrictions on densities and intensities. Figure 2 presents the safety zones (Zones 1, 2, 3, 4, 5, and 6) for Rio Vista Airport including the extension of Runway 7/25. Due to existing development located to the west and southwest of the Airport, flight tracks associated with Runway 15/33 remain to the east of Runway 15/33. This is reflected in the development of the safety zones for Rio Vista Airport.

Zone 1, the Runway Protection Zone, is located just beyond the runways in each direction, within the runway primary surface and clear zones. The dimensions of this zone are specifically defined in accordance with 14 CFR Part 77 criteria.

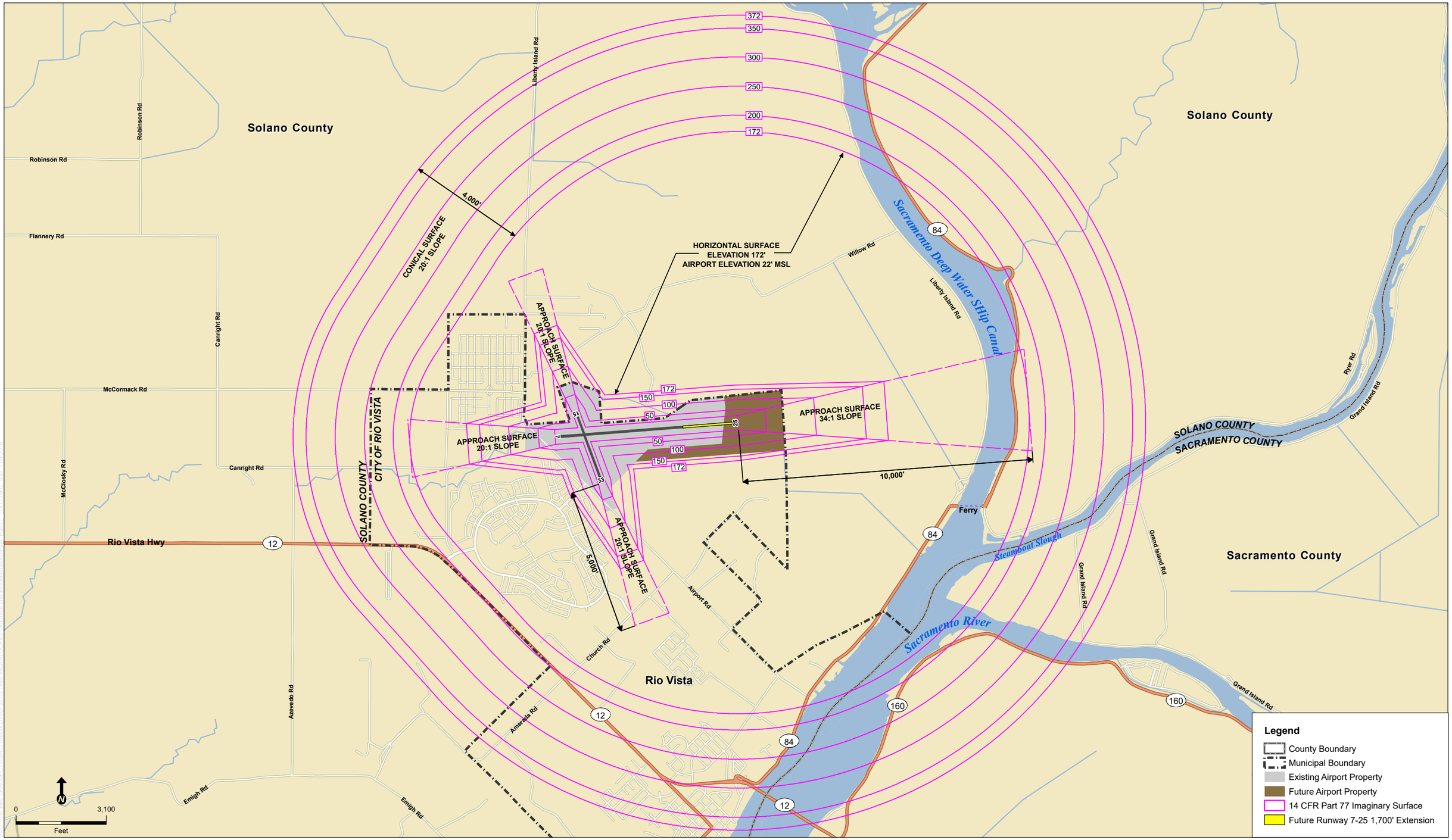
Zone 2 consists of the Inner Approach and Departure Zone and is intended for areas involving aircraft flying at an altitude between 200 and 400 feet above the runways. This area is delineated as being 1,500 feet wide (using the center of the runway) and extending 4,000 feet past the runways.

Zone 3 is the Inner Turning Zone and extends 30 degrees to the sides of the runways, running 5,000 feet from the center of the runways.

Zone 4 is the Outer Approach / Departure Surface for the Airport, is 1,000 feet wide, and extends an additional 3,000 feet from Zone 2.

Zone 5 is the Sideline Zone and extends 750 feet on each side of the runways.

Lastly, Zone 6 includes all remaining locations beneath any of the Rio Vista Airport airspace protection surfaces delineated in accordance with the 14 CFR Part 77 guidelines as well as areas that are or will be subject to frequent aircraft overflight.



SOURCE: USDOT. FAA. 14 CFR Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace, July 21, 2010; Reinard W. Brandley, 2016; Adapted by ESA, 2016; ESRI Mapping Services
NOTE: All elevations depicted are mean sea level (MSL).

Rio Vista Municipal Airport ALUCP.150732
Figure 10
14 CFR Part 77 Imaginary Surfaces

ESA

DRAFT FOR DELIBERATIVE PURPOSES ONLY

This page intentionally left blank

For issues of safety compatibility, the 2011 Handbook recognizes the impracticability of prohibiting development within the vicinity of an airport or airfield. As a result, the 2011 Handbook expresses the need for a careful delineation of safety zones to ensure suitable compatibility criteria are established for ALUCPs. Risk acceptability is critical to this process, mainly requiring an understanding of spatial distribution, potential consequences, and frequency to create an appropriate conceptual basis for safety zone demarcation. The 2011 Handbook elaborates these criteria further as follows:

- The spatial distribution component is accounted for by the shape and size of safety compatibility zones.

- Potential consequences are addressed through the compatibility criteria— the limitations on usage intensity and other land use characteristics that affect the potential severity of an accident.

- The frequency component can be accounted for through adjustment of zone sizes or the criteria applicable within each zone. Frequency is primarily a factor at airports (or on runways) with very low activity. For most airports, the potential consequences component dominates the overall risk.

The major goal of an ALUCP is to minimize the exposure of persons to these risks, and as such, the 2011 Handbook prepares the appropriate residential densities and nonresidential intensities that are appropriate within the specific safety zones.

Overflight

For issues of overflight in the 2011 Handbook, compatibility policies focus on informing prospective property owners of the presence of an airport and making them aware of the potential for noise impacts associated with overflying aircraft. The ALUCP can serve as a tool to inform the people near airports of any overflights that occur in their vicinity to avoid or minimize the potential annoyance associated with overflight conditions. The 2011 Handbook recommends buyer awareness measures as a key strategy in informing the public and enabling potential consumers of property near the airport or airfield of these potential nuisances. The 1988 ALUCP already provides this regulation.

Potential Conflicts from Planned Land Uses

Regarding safety zones within the planned land uses in the vicinity of the Airport, there may be some conflicts with low density residential uses planned for areas to the west and south of the Airport that are located within Zones 2 and 3. While neither safety zone outright prohibits new residential development, Zone 2 requires planning to avoid all residential development and Zone 3 seeks residential development to be limited to only very low densities.

Airspace protection does not pose any conflicts for planned land uses in Rio Vista or Solano County.

Regarding overflight, large swathes of Rio Vista and Solano County are located within Zone 6, and as such, the height of all structures would have to remain within the 200-foot limit.

Additionally, these jurisdictions and their landowners would need to be appropriately informed of the presence of their community in an overflight zone for Rio Vista Airport. Solano County ALUC may consider different methods of outreach and strategies such as buyer awareness measures to ensure that existing and potential landowners are aware of overflight in their community.

11. References

Caltrans – California Department of Transportation, Division of Aeronautics. 2011. California Airport Land Use Planning Handbook. October 2011.

City of Rio Vista, 2017. City of Rio Vista Municipal Code, Title 17. Available: http://qcode.us/codes/riovista/. Accessed February 23, 2017.

City of Rio Vista, 2007. Rio Vista Municipal Airport: Master Plan Update. June.

Environmental Science Associates, 2017. Existing and Future Conditions Data. February.

Solano County, 1988. Rio Vista Airport: Airport Land Use Compatibility Plan. May.

Solano County, 2017a. Solano County Zoning Regulations, Chapter 28. Accessed: http://www.co.solano.ca.us/depts/rm/planning/zoning_regulations. Accessed February 23, 2017.

Solano County, 2017b. "Solano County Airport Land Use Commission," Solano County website. Available: http://www.co.solano.ca.us/depts/rm/boardscommissions/solano_county_airport_land_use_commission/default.asp. Accessed February 23, 2017.

This page intentionally left blank