Working Paper One

Nut Tree Airport Master Plan

THE **Barnard Dunkelberg Company** TEAM

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TULSA
1616 East 15th Street
Tulsa, Oklahoma 74120-6027
Phone Number. 918 585 8844
FAX Number. 918 585 8857

DENVER
1743 Wazee Street, Suite 400
Denver, Colorado 80202
Phone Number. 303 825 8844
FAX Number. 303 825 8855

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Introduction and Vision

INTRODUCTION. The Master Plan for Nut Tree Airport (VCB) establishes guidelines for improving the Airport's facilities over the next 20 years, and represents a collaborative vision of Nut Tree Airport (the Airport) in the future, recognizing the operational, economic and environmental factors that will influence its development. This Airport Master Plan is comprehensive and is the first full-scale master planning effort to be undertaken for the Airport since 1993. It is being conducted by Solano County (the County), which owns and operates the Airport. The Master Plan is funded, in part, with a grant from the Federal Aviation Administration (FAA).

The Master Plan identifies the type and extent of facilities that are required to meet forecast aviation demand at the Airport and evaluates a full range of alternatives for improving facilities consistent with forecast requirements. The Master Plan concentrates primarily on the physical aspects of the Airport and the associated development requirements to meet its intended future.

The Master Plan effort begins with an assessment of the Airport's current strengths and weaknesses and a prognostication of its future opportunities and threats as reported in small group sessions with various process stakeholders. These stakeholder assessments have been used to synthesize derived common vision themes that positively state *future* qualities of the Airport, recognizing the weaknesses and threats that should be overcome and, at the same time, building on the Airport's strengths and maximizing its potential to either capitalize on or factor to realize opportunities.

Visions of Nut Tree Airport's Future

Seven vision themes guide the development of a 20-year plan for improving facilities at Nut Tree Airport. *The vision themes are expressed in present tense and represent a "desired end state" that should be supported by the Master Plan's recommended physical development.* The visions for Nut Tree Airport's future are based on information gathered during the Master Plan's initial stakeholder outreach focus groups and represent the perceptions of the many groups and individuals that have a stake in the future of Nut Tree Airport.

Together, these individuals and groups have articulated goal-worthy and inclusive vision statements for the future of the Airport. Nut Tree Airport is designated as a general

aviation in the National Plan of Integrated Airport Systems (NPIAS). In this important role, the Airport accommodates general aviation activity in the busy I-80 corridor between the East Bay and Sacramento. These vision themes affirm the Airport's continued designation in the NPIAS as an airport of significance. Nut Tree Airport has seen the highs and lows of this segment of the aviation market and is a reflection of the transformations that have taken place in general aviation in the past 30 years.

Nut Tree Airport is Strategically Located

Perhaps the most significant asset for Nut Tree Airport is its location. Roughly equal distant to the Bay Area and Sacramento, Solano County is a great location for both corporate and residential value in a more relaxed atmosphere than found in San Francisco or the State Capital. Both metropolitan areas are within an easy drive. This vision theme recognizes the value of the Airport's geographic location and states that the planning effort should incorporate this feature as a positive attribution of the Airport.

In addition, a locally-known benefit to this location is that Nut Tree Airport resides within an area that enjoys considerably more fair weather days than either the Bay Area or Sacramento. This is most noticeable in the number of Visual Flight Rules (VFR) days experienced annually. This metrological phenomenon is a significant benefit for flight training activity as well as corporate aviation.

Nut Tree Airport is a Full-Service General Aviation Airport

Nut Tree Airport is a full-service aviation facility offering a wide range of services with room to grow – both in services provided and facilities to accommodate demand. Airside needs are met with adequate runway length to meet present and future needs. The airport is supported by instrument approach capabilities for use during periods of inclement weather and landside development is met with first class facilities and services are provided by a full range of service providers. The Airport's businesses are healthy. Its tenants are a diverse group, offering aircraft charter services, aircraft fueling, aircraft maintenance and refurbishment, avionics repair, pilot training, and aircraft storage. Fixed Based Operator (FBO) services are provided by individuals with a focus towards superior services and customer satisfaction.

This vision theme asserts that Nut Tree Airport will continue to offer an increasing range of general aviation services. The Master Plan should strive to ensure that this vision theme can be forwarded by providing a development program that meets the needs of the Airport's diverse tenants and users. Weaknesses exist and need to be addressed. For example, to be completely congruent with this vision theme, additional runway length and all-weather approaches may be appropriate to accommodate current users; an FBO services provider needs to be in operation; and, additional hangar facilities may be needed to meet forecast need. In addition, some of the facilities are aging and renovation may be necessary. Security and limited access to aircraft operations areas

should be addressed in the Master Plan to enhance the safety of aircraft activity. Compliance with federal and state minimum standards should be analyzed in the Master Plan to ensure that Nut Tree Airport can fulfill this vision theme in an ever changing aviation industry.

Nut Tree Airport is a Gateway to the Area

The Airport is a direct link to the community it serves, providing access to area restaurants, shopping, businesses and attractions. This vision theme addresses the need for positioning Nut Tree Airport as a vital and supporting transportation link connecting Solano County, Travis AFB, and the cities of Vacaville, Fairfield and Dixon to the region and beyond. In addition, transportation to the Nut Tree development area and other key locations is provided for airport users and visitors facilitating this connection and providing for a seamless experience.

This theme asserts the Airport as a portal to the community, linking Solano County to the world. Physically, it suggests an ease of access to and from the Airport and retail centers as well as other points of interest in the immediate area. Historically, Nut Tree Airport was directly linked to the Nut Tree via a small rail line that carried visitors back and forth between the two developments as an item of convenience and a recreational novelty. Implementation of this theme is has been hampered by the loss of property connecting the Airport to the Nut Tree development area, the closing of the amusement park, and the subsequent relocation of the train to another part of the development. As a practical application, this linkage can be extended to retail centers as well, if bus routing, courtesy cars, and identified transient aircraft parking were provided. Therefore, it is important that the Master Plan recommends development that considers this linkage and facilitate this use.

Nut Tree Airport has a Storied History and is Part of the Local Community

One of the important values of Nut Tree Airport is that it has “roots” in the community; seemingly, every area resident has a fond memory of visiting the Nut Tree during their youth. Moreover, Nut Tree Airport has notable name recognition outside of Solano County. This storied history and strong connection to the community must be captured *(or recaptured, if you will)*, for a stronger and more viable airport to emerge from this planning program. Many airports struggle for market branding and name recognition. The Nut Tree Airport still possesses this historical branding, but has lost much of its focus and linkage to area attractions over time. Certainly, fundamental changes within the Nut Tree development itself have contributed greatly to the loss of this connection. This vision theme seeks to recapture this linkage and leverages the connection to help the Airport reestablish one of its important market niches. In so doing the planning program may well serve to enhance community support and a sense of “ownership” by the residents of Solano County.

The Nut Tree Airport is Sustained by Supportive Intergovernmental Relationships

The most often cited weakness of the Nut Tree Airport is not any particular facility or operational short come, rather the most common threat to the Airport is the perception of poor intergovernmental relationships. Particularly cited is the relationship between Solano County and the City of Vacaville. A strong sense of distrust and operating at crossed purposes was a reported perception of some interviewed stakeholders when describing past practices. A sense of competing development philosophies and land use goals was also suggested. In addition, some stakeholders expressed a general sense of government distrust, which may well contribute to the perceptional issues.

It is important to note that much progress has been made in establishing a more positive and supportive relationship between the City and the County in recent years. A spirit of cooperation has emerged that is quite promising. Therefore, the purpose of this vision theme is to continue the effort initiated by the City of Vacaville and Solano County to erode these perceptions by capitalizing on the common value of the Airport as a public asset and a county-wide cornerstone of economic development opportunity.

Nut Tree Airport is Compatible with and Valued by the Surrounding Community

Nut Tree Airport is valued by its neighbors and recognized as a significant contributor to the local economy. The compatibility of Nut Tree Airport with its surroundings is an important concern of the Master Plan. The need to safely and efficiently accommodate future growth in aviation activity must be balanced with the need to minimize aircraft noise, and traffic congestion concerns for the Airport's neighbors. This vision theme recognizes the importance of maintaining compatibility between the Airport and its surroundings.

Over the years, land use patterns have been established by the City of Vacaville in support of general quality of life goals and local economic development. With origins as a private airport, Nut Tree Airport was not a land use planning concern for Solano County for many of its formative years. As a result, when the Airport became the property of the County, many land use patterns had already been established. Complicating this situation is the fact that the value of the Airport and its contributions to the local community are not widely understood. This fact may contribute to minimizing the Airport's value when establishing land use priorities. The purpose of this vision theme is to strive to maximize compatibility between the Airport and its present neighbors and to reduce the potential for land use conflicts in the remaining undeveloped or underdeveloped areas within the Airport's environs.

Nut Tree Airport Benefits from Consistent and Straightforward Property Development Regulation

Parties wishing to develop leasehold interests at Nut Tree Airport are met with logical, straightforward, and consistent building requirements. Another criticism of both Solano County and the City of Vacaville is the confusion in development regulations and enforcement authority. This vision theme recognizes the importance the need to develop third-party facilities in a reasonable timeframe and to provide both direction and clarity in meeting development requirements. Doing so will reduce reported frustration and enable the Airport to be more competitive with other airports in the region. The master planning process should express the importance of such lucid and efficient development regulations that support the competitiveness of Nut Tree Airport.

Assessment of Nut Tree Airport's Strengths, Weaknesses, Opportunities and Threats

The vision themes expressed above for Nut Tree Airport's future are based on a generalized assessment of the Airport's strengths, weaknesses, opportunities and threats as reported by stakeholders participating in the focus group process. This assessment provides a beginning point for the Master Plan. These comments represent the opinions, views and impression of a wide variety of stakeholders and may or may not reflect the views of all or, in some cases many in attendance, but were earnestly felt by a given constituency.

It is appropriate to mention on balance, that reported weaknesses and opportunities outnumbered the strengths and threats during the focus groups. Also, where similar comments were made, the consultant has attempted to combine thoughts into a single expression of a strength, weakness, opportunity or threat in the interest of efficiency and brevity.

Strengths and weaknesses describe existing conditions that the planning effort recognizes at the onset, whereas opportunities and threats are potential future conditions that the planning effort must anticipate when developing its recommendations.

Strengths

Nut Tree Airport has many strengths upon which to build the Master Plan. These strengths range from the fact that it is a well established airport in a very convenient location, to the quality of its physical facilities and diversity of aviation services. Strengths cited by stakeholders include the following paraphrased comments:

- The area's better weather makes the Airport extremely attractive if it had runway extension.

- The Airport offers lower operating costs, taxes, and access from major freeways.
- If the northwest area was developed as a business park or center of commerce, would provide buffer for housing and potentially increase revenue.
- Airport is an asset for attracting retail business and other local business.
- Marketing the Airport as an asset; identify and promote its benefits as a revenue source.
- Currently very few noise complaints.
- Something magical about the Airport's operating environment: weather, history, opportunities.
- Success of an airport starts & ends with the flight school, which continues to get people to the Airport.
- The Nut Tree Airport name and the Airport's history are very marketable and should be used and played upon in the development of an airport.
- Room for growth, location, climate, history, population, and name. People will come a long way if the right stuff is here.
- The Airport has good local roadway access and easy access to the Interstate highway system.
- Parking at the Airport is "great" and free.
- Nut Tree is a safe Airport for small aircraft.
- The Airport can accommodate some corporate flights and flights for medical purposes such as the delivery of organ transplants.
- The Airport is a CALSTAR helicopter emergency medivac location.
- Nut Tree Airport is established and well-suited to aviation. It has roots and a history in the community.

Weaknesses

Stakeholders cite a number of existing weaknesses that limit the ability of Nut Tree Airport to reach its full potential. Many of these weaknesses can be addressed in the Master Plan, such as the need for new facilities, land use compatibility and the complexity of administration, while other weakness may well go beyond the scope of this planning program. Weaknesses include the following paraphrased responses:

- Part135 limitations, regulations require balanced field length of 60% or more for landing large aircraft.
- Security: controlled access, fencing, etc. folks seen around the Airport during late evening hours with animals, etc.
- Lack of county hangars to accommodate existing demand.

- North and northwest community: more noise complaints (Brown's Valley area).
- Cooperation between County & City by viewing airport development as mutually beneficial, need a process for increasing cooperation, also need for better communication/cooperation between city, county and airport management.
- No RTO/remote site for direct communication to Travis for clearance.
- Current lack of an FBO and aviation related services.
- Too much regulatory scrutiny by county and city: it's excessive and onerous.
- Vehicle traffic: speeding, controls, better education & enforcement (training, signage, car/plane interface).
- Some county regulators don't seem to understand the vision or mission of the Airport.
- No business plan for the Airport.
- Airport is an under-utilized asset, could accommodate more corporate aviation (local, regional and international companies).
- Challenge with connectivity is intervening property owners; coordinate better with the City of Vacaville.
- Lack of hangar development and/or hangar management plan and the need for an increase in private/corporate hangar space.
- Sewer/water hook-ups and potential environmental impacts.
- City of Vacaville support or lack thereof for an ILS/precision approach.
- Deed restrictions/disclosures for east side never developments.
- Helicopter traffic pattern (safety) not published.
- Need for an independent aviation department and airport specific accounting - lack of fiscal information about the Airport can hinder planning.

Opportunities

The future of Nut Tree Airport will depend, in part, on the ability of the County to position the Airport to take advantage of several important opportunities. The opportunities generally focus on attracting new demand to the Airport, increasing revenues, and building more community support. Specific opportunities cited by stakeholders include the following paraphrased comments:

- Extend runway to 6,000 feet, preferably to the north. The runway extension is a high priority.
- A runway extension would:

  - potentially reduce noise
  - increase/attract use by corporate aircraft
  - draw business and increase revenues
  - potentially attract more tenants from overloaded Napa/Bay Area airports
  - improve safety
  - economic benefit to surrounding community
- Precision approach need (but not as critical as runway extension).
- More county hangars/already a big demand for both county and private hangar space.
- Consider pattern change from west to east side to avoid residential overflights.
- Airport strategically located, take advantage of this fact.
- Restaurant: good public relations interface with the surrounding community: consider an observation deck and a play area.
- Cooperation between county & city by viewing airport development as mutually beneficial, need for synergy.
- Good FBO is a cornerstone for the Airport.
- Connectivity to Nut Tree retail: possible shuttles/co-marketing efforts with Nut Tree Village.
- Coordinate Nut Tree development area master plan with the airport master plan.
- Utilization of north site- creates connectivity.
- Consider non-aviation land uses such as a 9-hole golf course.
- Look into relocating the Museum from Travis. This would be a great in combination with restaurant and observation deck promoting community access to the Airport.
- Outreach to Spanish-speaking residents: utilize schools, realtors (weekly breakfast)/youth programs and local colleges and Airframe and Power plant (A&P) programs.
- Asset for economic development, attract business to area.
- Net energy producer, solar/solar panels on sparking.
- Consider solar panels on parking structure.
- Public bus stop (i.e. Redding) connected to downtown.
- Create economic cost/benefit analysis. (i.e. what is the financial benefit?) and include attracting local corporations.
- The Airport could be a gateway to factory outlet stores as there is a lot of untapped potential.
- Maybe the master plan could include a space for community-based functions, like a cultural center or meeting room.

Threats

The threats to Nut Tree Airport reflect the wide variety of stakeholder concerns regarding potential or perceived development consequences. Many of these threats can be addressed during the planning process. Specific threats paraphrased from responses include:

- Airport development would precipitate more traffic/noise…consider new patterns/noise mitigation measures.
- County should reduce regulatory scrutiny: it's excessive and onerous.
- Value and utilization affected by runway extension; need cost/benefit analysis. Property values could also be impacted by the extension.
- Land use needs should be balanced against environmental impacts of the runway extension.
- Avoid new height restrictions on surrounding businesses.
- Property owners between the Airport and the Nut Tree Development impede direct access.
- Coordinate/minimize any impacts from airport expansion to Travis (special air ops/airspace; flight patterns, etc.).
- Sewer/water hook-ups and potential environmental impacts.
- Assess/evaluate impacts on private property owners.
- Surface transport: regional (I-505/80) -avoid impacts.
- Coordination between off-site zoning & master planning.
- Increased noise/lighting (flood lights on buildings, etc.) threat to surrounding.
- Need to overcome turf wars between City & County.
- Consider impacts if heavy jet traffic results from changes.
- Real transparency in airport finances and ownership is needed.

Summary

In summary, the Master Plan begins with collective and thematic statements that support the future development of Nut Tree Airport - recognizing the Airport's strengths, weaknesses, opportunities, and threats. The vision themes are the basis for the physical plan that is developed in the Master Plan. The following chapters progressively build the recommended development plan. As a first step, Chapter B, *INVENTORY* provides a detailed inventory of existing conditions at Nut Tree Airport.

Informed Consent

Informed Consent is implicit to successful vision implementation. The intent of "informed consent" is the open and honest dialog between parties having different points of view, representing various stakeholders to meet a common end and satisfactory conclusion. In practice, the principal is to reach a *practical consensus* amongst stakeholders. Not every viewpoint will be affirmed in total, but consideration will be given to each party's perspective. Informed Consent is not total agreement; it does, however, mean that all stakeholders are invested in, and have participated in the outcome, knowing that their views were earnestly considered.

Inventory of Existing Conditions

INTRODUCTION. Nut Tree Airport (the Airport or VCB) is located in the City of Vacaville, California. Situated 117 feet above sea level in Northern California, the Airport serves Solano County and multiple communities within the Sacramento Valley region. Nut Tree Airport is a public use airport owned and operated by Solano County that is open to the general public and to visiting aircraft. Nut Tree Airport office is attended from 8:00 a.m. to 5:00 p.m. Although the Airport does not have any commercial passenger activity, it does provide services such as aircraft maintenance, aircraft mechanics training, fuel service, aircraft charter, aircraft rentals, and flight training. The Airport has been in continuous operation at this site since 1955 and is an important element of the national airport system.

Nut Tree Airport is located in Northern California, approximately two miles northeast of Vacaville, 32 miles southwest of Sacramento, and approximately 56 miles northeast of San Francisco, California. The Airport provides a safe operating environment for general aviation aircraft, ranging from light sport aircraft to small corporate jets. The Airport's relative location within the region is illustrated in the following figure entitled *AIRPORT LOCATION MAP*.

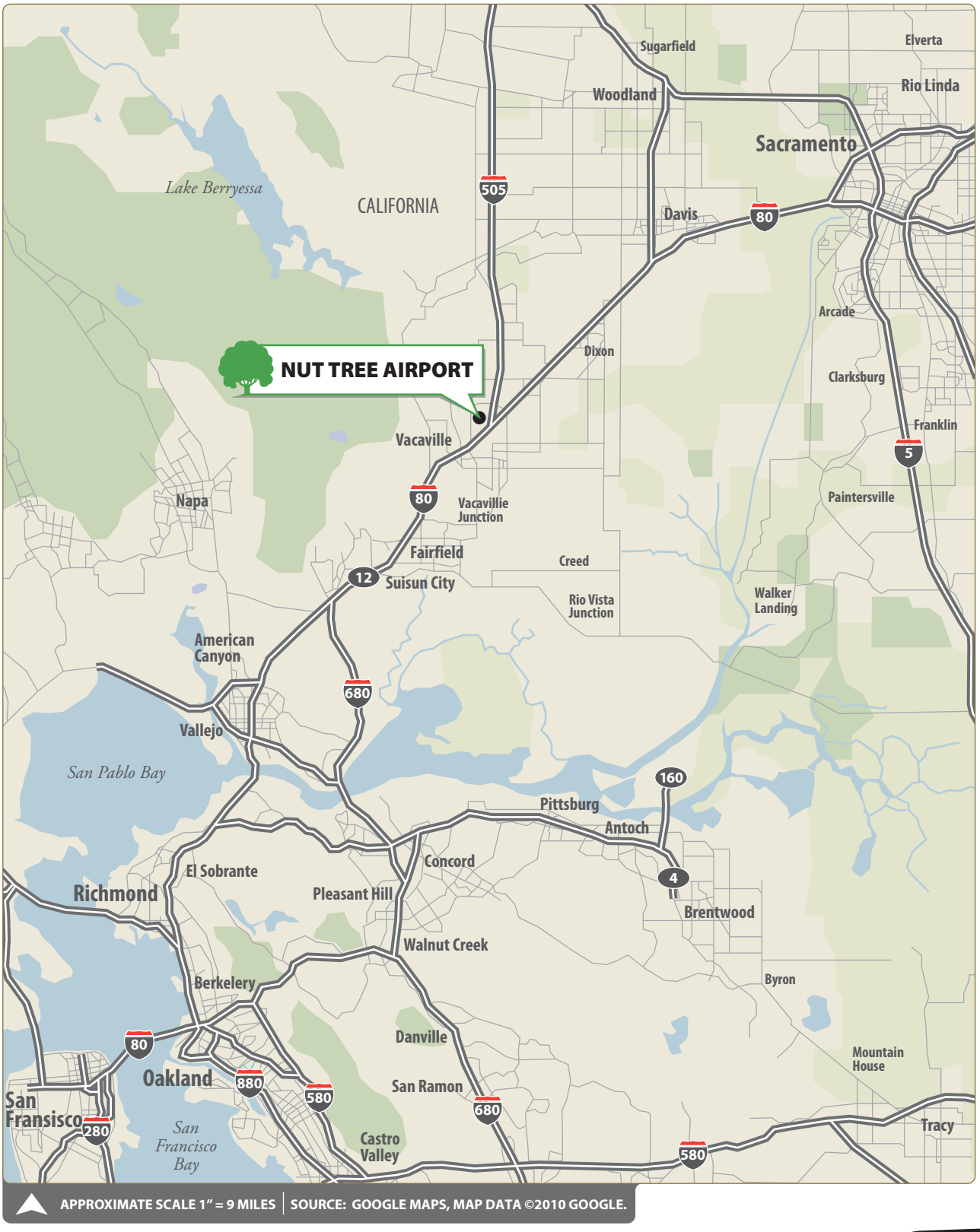
Vacaville is surrounded by several cities, including Dixon, Fairfield, and Winters. Although Vacaville has not grown significantly in the last ten years, the moderate growth of the surrounding communities has influenced Vacaville and the regional transportation system.

The most recent master planning study for Nut Tree Airport was completed in 1993 with the Airport Master Plan, and the last Airport Layout Plan (ALP) Update was completed in 2007. Since that time, aviation issues on the local, regional, and national levels have changed. The FAA typically requires a Master Plan and associated Airport Layout Plan (ALP) to be on file prior to receiving federal aid. The FAA also recommends that an Airport Master Plan be updated every five to ten years.

This Airport Master Plan Report is intended to provide a comprehensive evaluation of the Airport, and result in a well-conceived long-term facilities and operational plan for the Airport. This initial *Inventory of Existing Conditions* chapter examines three basic elements involved with the existing and future development of Nut Tree Airport. These elements are:

- **Airport facilities** (runways, taxiways, aircraft parking aprons, hangars, ground access, etc.)**;**
- **Relationship of the Airport to the airspace system; and,**
- **The airport environs.**

Subsequent chapters will detail the Airport's forecasts of aviation activity, the ability of airport facilities to safely and efficiently meet the needs associated with the projected aviation activity, the compatibility of the Airport with surrounding land uses, and recommended future development within and around airport property.



APPROXIMATE SCALE 1" = 9 MILES | SOURCE: GOOGLE MAPS, MAP DATA ©2010 GOOGLE.

FIGURE B1 Airport Location Map

Airport Role and Facilities

Nut Tree Airport is owned and operated by the County of Solano, and is a division of the Solano County General Services Department. The Nut Tree Airport Land Use Commission is responsible for review and approval of all off airport land use proposals. The Solano County Airport Advisory Committee consists of five members and provides counsel to the Solano County Board of Supervisors and Solano County officials in regard to policy matters for airport operations and management concerns.

The Airport is classified as a general aviation (GA) airport by the FAA's National Plan of Integrated Airport Systems (NPIAS). As shown in the previous illustration, entitled *AIRPORT LOCATION MAP*, Nut Tree Airport is located west of Interstate 505 (I-505) and north of Interstate 80 (I-80), on the northeastern edge of Vacaville. More detail is depicted, along with the Airport's more immediate surroundings in the following figure entitled *AIRPORT VICINITY MAP*.

According to an article in Vacaville Magazine[1], the first aircraft operation in Vacaville took place in 1929 when Barnstormer Ernie Smith made a forced landing in a field behind a small fruit stand along Old Highway 40. Years later in 1955, Ed Power, (the son of the owners of that small fruit stand) scraped out a 1,900-foot dirt strip behind the family restaurant. Two years after the dirt strip was constructed, the newly formed Solano County Irrigation District was looking for land to purchase for one of its major water canals. A portion of the land where the dirt strip lay was sold to the irrigation district and the money was used to realign and pave the runway. Since that time Nut Tree Airport has grown continually and in 1970, the Airport was officially donated to Solano County.

Nut Tree Airport historically served as a tourist destination. Those traveling along I-80 in between Sacramento and the San Francisco Bay area would stop at the popular "Nut Tree" (including its restaurants, shops, orchards, gardens, etc.) in Vacaville. A ¼-mile small gauge railroad track was constructed in 1955 running from the Nut Tree Restaurant to the Airport, to provide direct access for pilots visiting the area[2]. The railroad track has since been relocated to the Nut Tree Amusement area for use by the new development. Nut Tree Airport now serves the general aviation needs of Solano County by providing many aviation-related services, including: business-related flying, recreational flying, flight training, aircraft charters, and other aviation-related activities.

[1] Vacaville Magazine November/December 2009.
[2] Sources: http://www.alamedainfo.com/nut_tree_CA.htm, http://www.nuttreeusa.com/.

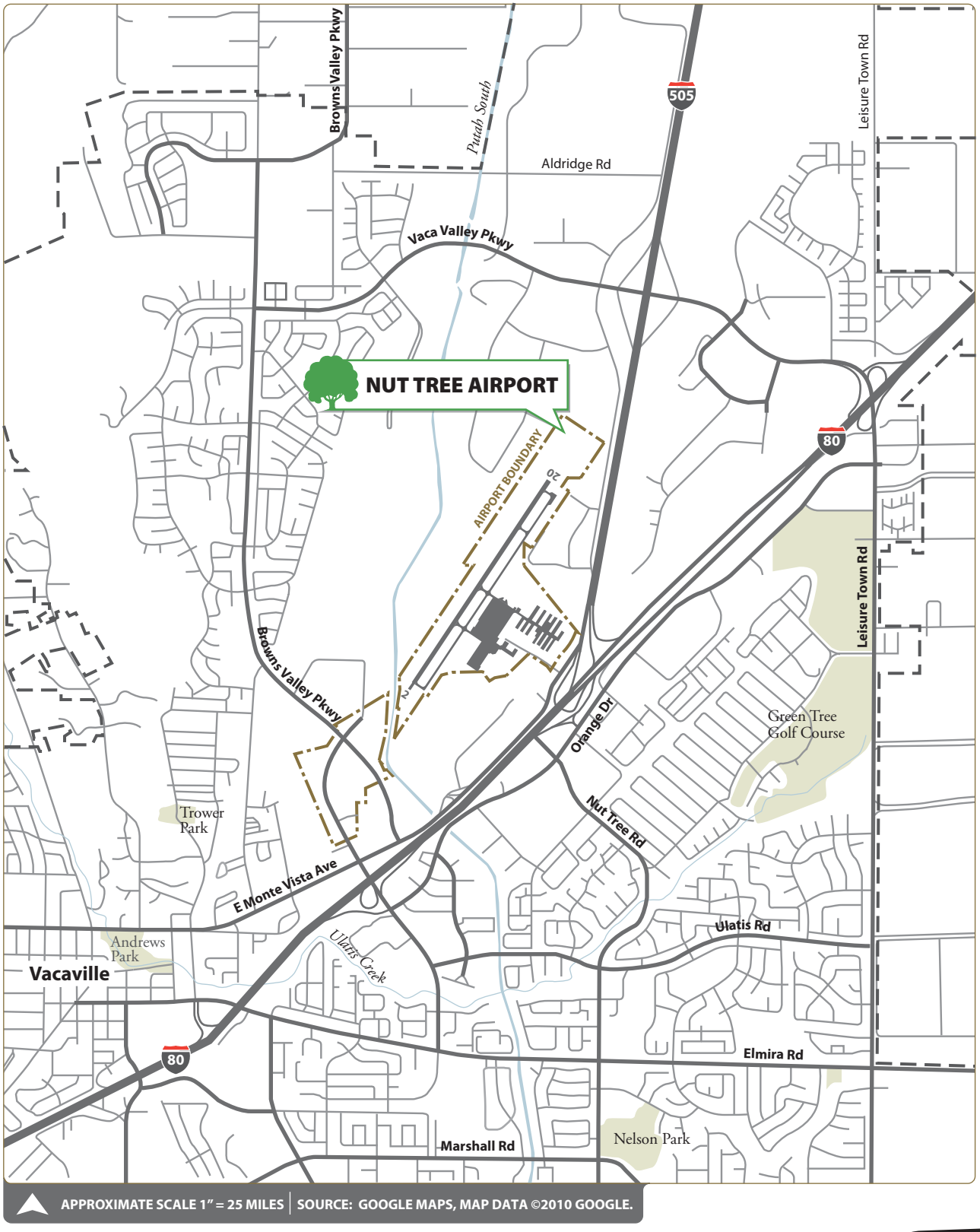


FIGURE B2 Airport Vicinity Map

Airside Facilities

Nut Tree Airport is operated with one primary runway, oriented in a northeast-southwest direction. One parallel taxiway provides access to the runway from the general aviation development areas. The following figure entitled *EXISTING AIRPORT LAYOUT*, provides a graphic presentation of the existing airport facilities.

The Airport Reference Point (ARP) for Nut Tree Airport is located at Latitude 38° 22' 40.0000" N and Longitude 121° 57' 41.7000" W. The Airport has an elevation of 117 feet above mean sea level (AMSL) and encompasses approximately 262 acres.

Runway. The primary runway at the Airport has a designation of 02/20. It is 4,700 feet in length and 75 feet in width. The runway is constructed of asphalt and has a gross weight bearing capacity of 30,000 pounds single wheel main landing gear configuration, and the runway pavement is currently in good condition. The runway is equipped with Medium Intensity Runway Lights (MIRLs), a two-light Precision Approach Path Indicator system (PAPI) and Runway End Identifier Lights (REILs) to each runway end, and is marked with standard/basic non-precision markings on each end.

In addition, Runway 02 has a published left-hand traffic pattern, with Runway 20 having a non-standard right-hand pattern.

Taxiway. In addition to the runway, the airside facilities at Nut Tree Airport consist of a taxiway system that provides access between the runway surface and the landside aviation use areas.

A full-parallel taxiway serves Runway 02/20 (Taxiway "A"), located on the east side of Runway 02/20 and is separated by 240 feet (runway centerline to taxiway centerline). Taxiway "A" is constructed of asphalt, and has five connector taxiways that connect to the runway. Taxiway "A" is 40 feet wide and is also constructed of asphalt. Additionally, an aircraft run-up area/holding bay is located on both the northeast and southwest end of Taxiway "A". For night use, the taxiway system is equipped with a Medium Intensity Taxiway Lighting system (MITL).

Five connecting taxiways link access between Runway 02/20, Taxiway "A", and the main aircraft parking apron. Two 40-foot wide taxiways connect the Runway 02 and 20 thresholds to Taxiway "A", and an additional 40-foot wide taxiway located approximately 900 feet southeast of the Runway 20 connecting taxiway also provides access to Taxiway "A".

Two connecting taxiways provide access to the main aircraft parking apron. The taxiway located

on the southern end of the apron is 42 feet wide, and the connecting taxiway located on the northern end of the apron is 46 feet wide.

Landside Facilities

The primary landside development area at the Airport is located on the east side of airport property. These facilities include an airport administration building, aircraft parking aprons, Fixed Base Operator (FBO) facilities, general aviation aircraft storage hangars, fuel storage facilities, an aircraft maintenance facility, a helicopter maintenance facility, aircraft wash rack, access roadways and auto parking.

Aprons. The main aircraft parking apron at Nut Tree Airport is located east of Taxiway "A". This apron consists of approximately 460,000 square feet of aircraft parking and movement space (including taxilanes), providing approximately 75 aircraft tie-down positions, four large aircraft parking positions and three helicopter parking positions.

Hangars and Aircraft Storage. The layout and location of the various hangar types are illustrated in Figure B3, entitled *EXISTING AIRPORT LAYOUT.* The Airport has approximately 107 hangar units in 25 separate buildings. The Airport leases approximately 61 T-hangars and end hangars and 6 large box hangars, and the remaining hangars (box and corporate) are privately owned. According to airport staff, there are approximately 24 aircraft owners on the hangar waiting list. Additionally, the Airport has two maintenance facilities, located southeast of the T-hangar apron area.

Fixed Based Operator (FBO). Presently, the Airport does not have an FBO; however, Solano County provides aircraft fueling services. A new FBO is anticipated to begin service in 2010, and the County will then transfer fueling operations to the new FBO. The new FBO facility will be located in Building #2, which is on the eastern edge of the aircraft parking apron, south of the airport administration building. The new FBO is also planning to construct additional facilities.

Wings Flight School. The Wings Flight School offers flight instruction which is located at Nut Tree Airport on the northeast area of the apron. Wings Flight School services include flight training, aircraft rental and sales, sightseeing tour flights, and aerial photography services.

FIGURE B3 Existing Airport Layout

Fuel Storage Facility. The Airport's fuel storage facility, which is owned and operated by Solano County, is located on the southeast side of the aircraft parking apron. Currently, aviation fuels are stored in two underground storage tanks: one 10,000-gallon 100LL AvGas tank and one 10,000-gallon Jet-A tank[3]. AvGas is delivered by a 500-gallon truck, and Jet A fuel is delivered by a 3,000-gallon truck. Solano County is responsible for maintaining the storage tanks to current Environmental Protection Agency (EPA) standards. The fuel sales records for the past four years are presented in the following table, entitled *AIRPORT FUEL SALES, 2006-2009.*

Table B1
AIRPORT FUEL SALES, 2006-2009

Year[1]	AvGas (gallons)	Jet A (gallons)	Total (gallons)	Total Net Sales ($)
2006	82,051	88,086	170,137	$607,141.60
2007	72,885	90,798	163,683	$610,073.10
2008	66,221	121,328	187,549	$878,783.50
2009	73,383	151,905	225,287	$761,062.90

Source: Nut Tree Airport management records.

[1] Fuel sales are based on from January 1st to December 31st of the Fiscal Year.

Automated Surface Observing System (ASOS). The Airport is served by an Automated Surface Observing System (ASOS), which is located approximately 1,150 feet north of the aircraft parking apron and 778 feet east of the runway centerline. This facility measures the following weather parameters: sky condition, visibility, wind, temperature, dew point, relative humidity, pressure, and obstructions to vision (i.e. fog, haze). The ASOS provides up to 12 data updates each hour to airborne pilots via VHF radio frequency. The radio frequency for the Nut Tree Airport ASOS is 134.75 MHz. ASOS data is also available via telephone at (707) 448-1594.

Aircraft Rescue and Firefighting (ARFF). The Airport does not presently have an Aircraft Rescue and Fire Fighting (ARFF) facility on the field; however, fire protection services for the Airport are provided by the Vacaville Fire Department Station No. 73, located approximately one mile northwest of the north end of the Airport.

[3] Fuel concessions will be transferred to the new FBO with anticipated fueling operations beginning in 2010. Fuel storage capacities are subject to change in accordance with the FBO's business plan.

Existing Ground Access and Parking Facilities

Ground Access. From a regional perspective, ground access to the airport administrative building and main entrance to Nut Tree Airport is provided by County Airport Road, by way of East Monte Vista Avenue, which is located on the east side of the Airport. East Monte Vista Ave. can be accessed directly from I-505 and I-80.

Parking Facilities. The main public automobile parking area associated with airport facilities is located directly east of the administration building, off County Airport Road. An additional automobile parking area associated with a private corporate hangar is located southeast of the main parking area.

Existing Airport Utilities and Services

Nut Tree Airport is serviced by most essential utilities, including water, wastewater (sewer), electric, and telecommunication. The following provides a brief description of current utility services and providers to Nut Tree Airport.

Electricity. Pacific Gas & Electric (PG&E) provides electrical service to northern and central California, including Solano County. PG&E power lines are located southeast of airport property.

Water. Water is provided to the Airport by the City of Vacaville. A 12-inch water line runs along the east, southeast, north, northeast sides of airport property. A 12-inch water line is proposed to run along the west and southwest areas of airport property, as identified in the 2007 City of Vacaville *General Plan*[4].

Wastewater. Wastewater (sewer) service to the Airport is provided by the City of Vacaville with a small portion of the Airport still on a septic system. A City-owned wastewater lift station is located on the east/southeast area of airport property, and a sewer line runs through the southwest portion of airport property.

Storm Water. The Putah South Canal, which intersects the south/southwest area of airport property, originates from the Putah Diversion Dam located at Lake Solano, located approximately nine miles northwest of Nut Tree Airport. One of the Putah South Canal detention basins for storm water is located on the west/southwest area of airport property[5].

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[4] City of Vacaville *General Plan*, Chapter 5, *Public Facilities, Institutions and Utilities*, Figure 5-1 *Conceptual Water System Improvements*, 2007.

[5] City of Vacaville *General Plan*, Chapter 9, *Safety Element*, Figure 9-3, *Vacaville – Flood Hazard*, 2007.

Several other storm water drainage areas are located on airport property, four of which are located along the west, northwest, and northeast sides of airport property, and an additional storm water drainage area is located southeast of the Runway 02 threshold.

Telephone. Telephone service to Nut Tree Airport and Vacaville is provided by AT&T. In addition to telephone service, AT&T also provides DSL service and internet services, including private dedicated services to customers throughout the City and County. It is estimated that current telephone services are sufficient to meet the projected growth of the region.

Existing cellular communications' providers to Nut Tree Airport and the City of Vacaville include AT&T Wireless, Verizon Wireless, T-Mobile, and many others. It should be noted that the FAA regulates the siting of towers that exceed 200 feet in height and smaller towers within 20,000 feet of a 3,200-foot runway or longer (i.e., Nut Tree Airport) at a 100:1 slope with filing requirements for FAA Form 7460-1 "Notice of Proposed Construction or Alteration."

Airspace System/Navigation and Communication Aids

As with all airports, Nut Tree Airport functions within the local, regional, and national system of airports and airspace. The following narrative provides a brief description of Nut Tree Airport's role as an element within these systems.

Air Traffic Service Areas and Aviation Communications

Within the continental United States, there are some 22 geographic areas that are under Air Traffic Control (ATC) jurisdiction. Air traffic services within each area are provided by air traffic controllers in Air Route Traffic Control Centers (ARTCC). The airspace overlying Nut Tree Airport is contained within the Oakland ARTCC jurisdiction. The Oakland ARTCC includes the airspace in portions of northern and central California and portions of western/central Nevada. Nut Tree Airport can be found on the San Francisco sectional chart. Aviation communication facilities at the Airport include the Common Traffic Advisory Frequency (CTAF)/Aeronautical Advisory Station (UNICOM) on frequency 122.7 (San Francisco Airport District). Additional communications associated with Nut Tree Airport include:

- **Oakland Center [Travis Air Force Base (SUU) Approach/Departure Control]** – Frequency 128.4.
- **University Airport (EDU) Automated Weather Observing System (AWOS)** – Frequency 119.025 or (530) 754-6839.
- **Yolo County Airport (DWA) AWOS** – Frequency 125.775 or (530) 750-2759.
- **Napa County Airport (APC) ASOS** – (707) 252-7916.

Nut Tree Airport does not have an airport traffic control tower (ATCT).

Surrounding Terrain Description

The airfield property is located in the northeastern portion of Vacaville, within the Sacramento Valley. Rapidly rising terrain associated with the Vaca Mountain Range is located to the west, northwest of Nut Tree Airport. Terrain is relatively flat south and east of the Airport.

Airspace

The following illustration, *AIRSPACE/NAVAIDS SUMMARY*, depicts the surrounding airports, local airspace, and navigational facilities in the vicinity of Nut Tree Airport. Local airspace surrounding the Airport consists of Class E airspace. The Class E Surface Airspace is typically represented as a five-statute mile radius circular area around the Airport and includes any extension necessary to include instrument approach and departure paths. Class E Airspace includes the controlled airspace extending upward from 700 to 1,200 feet above the airport elevation. These areas are generally designated at outlying airports with low activity and with non-precision instrument approach procedures providing high minimum descent altitudes. Radio communications and transponders are not required to operate within these airspace areas under visual flight rule (VFR) conditions; however, Instrument Flight Rule (IFR) flights must be capable of communicating with air traffic control (ATC), which is currently available through Travis Approach and Departure Control on frequency 128.4.

Military air bases, Military Operations Areas (MOAs), and restricted areas can also impact airspace use in the vicinity of a civil airport. There is one military air base located within a 35-NM radius of Nut Tree Airport; Travis Air Force Base (KSUU) is located approximately seven NMs south of Nut Tree Airport. There are no MOAs or restricted areas in the vicinity of the Airport.

Travis Air Force Base (AFB) Mid-Air Collision Avoidance (MACA) Program. The Travis AFB MACA Program was developed to promote flight safety by informing pilots of the midair collision potential between civilian and military aircraft within the vicinity of Travis AFB. Travis AFB has several based large or "heavy" military aircraft, including the KC-10, C-5, and the C-17, which are frequently flown for training operations. In addition to these local military aircraft, heavy transient military aircraft also frequently operate within the Travis AFB Alert Area (A-682), which contains the Travis VHR overhead and IFR radar patterns.

Travis Approach/Departure Control is used by IFR and VFR aircraft from local airports in the

vicinity, which includes Nut Tree Airport. Military aircraft in this area frequently fly approaches into Travis AFB from a variety of different altitudes (from 1,800 feet to 10,000 feet AMSL), airspeeds, and directions. The MACA Program stresses extreme caution to pilots flying in the Alert Area due to the wake turbulence generated by these heavy military aircraft, as well as high rate climbs and descents, and random maneuvering by heavy aircraft over the top and within the vicinity of the Alert Area from 1,600 feet to 10,000 feet AMSL. The Alert Area vertical limits extend to 6,000 feet AMSL to the north (of the extended runway centerline), and 3,000 feet to the south. The lateral boundaries of the Travis AFB Alert Area are shown on the following graphic, Figure B4 *AIRSPACE/NAVAIDS SUMMARY.*

Navigational Aids

A variety of navigational facilities are currently available to pilots around Nut Tree Airport, whether located at the field or at other locations in the region. Many of these navigational aids are available to en-route air traffic as well. The navigational aids (NAVAIDS) available for use by pilots in the vicinity of the Airport are VOR/DME, VORTAC, and NDB facilities.

A VOR/DME system is a Very High Frequency Omnidirectional Range Station with Distance Measuring Equipment transmitting very high frequency signals, 360 degrees in azimuth oriented from magnetic north. This DME equipment is used to measure, in nautical miles, the slant range distance of an aircraft from the navigation aid.

A non-directional beacon (NDB) is an L/MF radio beacon transmitting non-directional signals, whereby the pilot of an aircraft equipped with direction finding equipment can determine his bearing to or from the radio beacon and track to or from the station. The operation of the NDB is very simple; however, precisely flying an NDB approach can be difficult. Therefore, NDB approach minimums are typically specified higher than other types of non-precision approaches. There are no NDB facilities located within the airport vicinity. The following table presents navigational facilities located within the vicinity (within a 35 NM radius) of VCB.

Table B2
NAVIGATIONAL FACILITIES

Navigational Facility	Associated Airport	Frequency	Distance to VCB
Travis VOR	Travis Air Force Base (SUU)	116.40 MHz	7.1 NMs S
Sacramento VORTAC	Sacramento Executive Airport (SAC)	115.20 MHz	23.4 NMs E
Concord VOR/DME	Buchanan Field Airport (CCR)	117.00 MHz	23.7 NMs S
Scaggs Island VORTAC	Napa Valley, CA[1]	112.10 MHz	22.8 NMs SW
McClellan VOR/DME	McClellan Airfield (MCC)	109.20 MHz	31.6 NMs NE

Source: Airnav.com www.airnav.com.

Notes: NM = nautical miles.

[1] Not located at an airport.

In addition, several existing visual navigational aids are located on the Airport and available to pilots. These include a rotating beacon and a lighted wind cone with a segmented circle. The beacon is located north of County Airport Road, adjacent to the T-hangar area. The lighted wind cone with a segmented circle is located approximately 1,317 feet northwest of the Runway 02 threshold. Two additional supplemental wind cones are located in the vicinity of the southwest and northwest of Runway 02/20. In addition, both runway ends are equipped with Precision Approach Path Indicators (PAPIs), which provide descent guidance for the visual segment of the approach and Runway End Identifier Lights (REILs) which help pilots positively identify the runway ends.

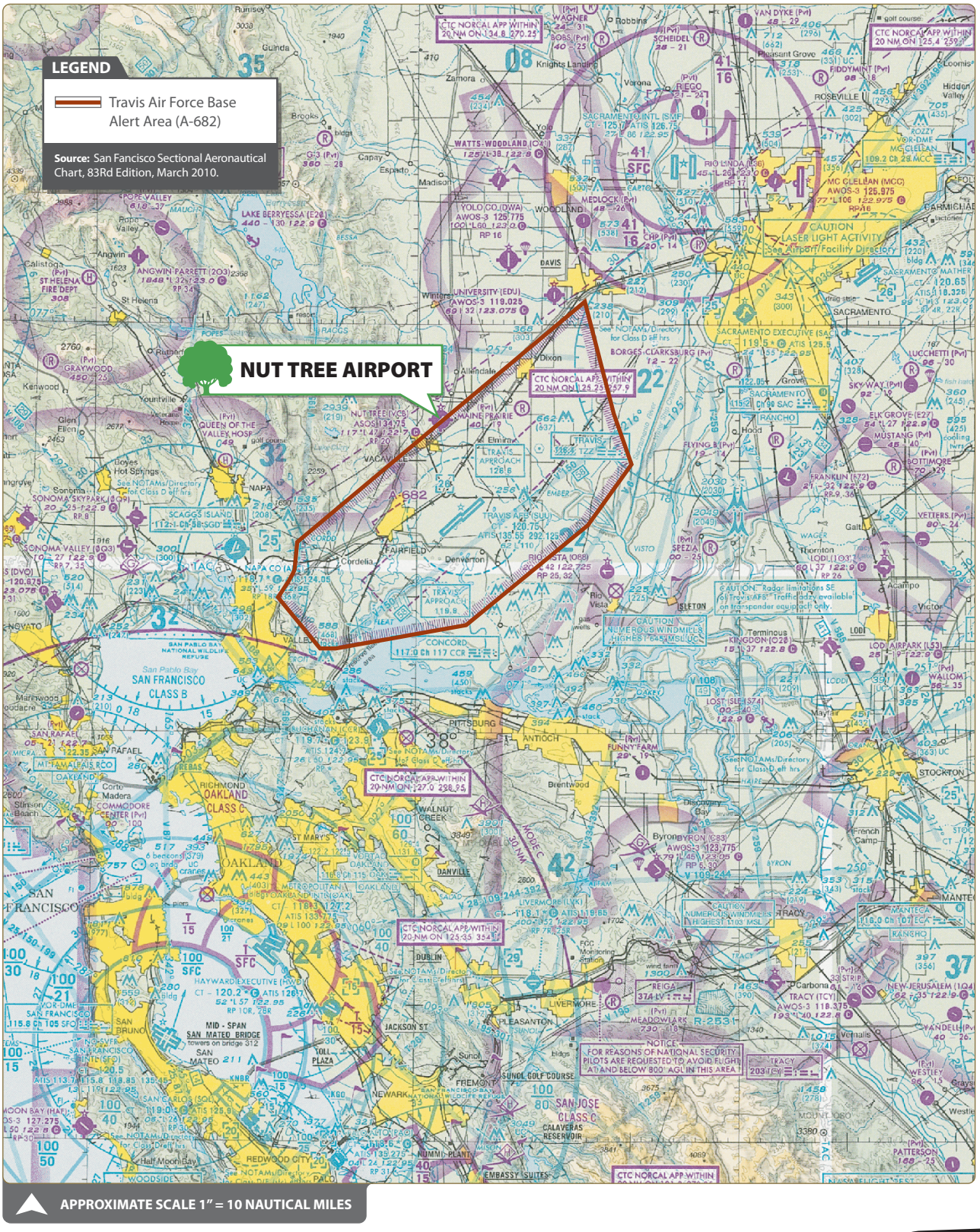

FIGURE B4 Airspace/NAVAIDS Summary

There is also a network of low-altitude published federal airways (i.e., Victor airways) in the vicinity of Nut Tree Airport, which traverse the area and span between the regional ground-based VOR/DME and VORTAC equipment. Victor airways include the airspace within parallel lines located four NMs on either side of the airway and extend 1,200 feet above the terrain to, but not including, 18,000 feet AMSL. When an aircraft is flying on a federal airway below 18,000 feet AMSL, the aircraft is operating within Class E airspace.

Nut Tree Airport currently has three published instrument approaches to the Airport. Runway 20 is equipped with an RNAV Global Positioning System (GPS) approach. The FAA is in the process of certifying and implementing new Global Positioning System (GPS) instrument approach technology [i.e., both Wide Area Augmentation Systems (WAAS) and Local Area Augmentation Systems (LAAS)], and the cost of establishing new or improved instrument approaches at airports will be significantly reduced.

Table B3
INSTRUMENT APPROACH PROCEDURES

Approach	Designated Runway(s)	Ceiling Minimum (AGL)	Visibility Minimums	Aircraft Category
RNAV (GPS) Y L	Straight-in/Runway 20	497′ AGL	1¾-mile	A, B, C, D
RNAV (GPS) Z	Straight-in/Runway 20	403′ AGL	1-mile 1 ¼-mile	A, B C
RNAV (GPS) Z	Circling	443′ AGL 463′ AGL 463′ AGL	1-mile 1-mile 1 ½-mile	A B C
VOR/DME-A	Circling	643′ AGL	1-mile 1 ¾-mile	A, B C

Source: U.S. Terminal Procedures, Southwest (SW), Vol. 2, 11 March 2010 – 8 April, 2010.

Noise Abatement Procedures

The only published voluntary Noise Abatement Procedures at Nut Tree Airport are included in the remarks section of the Airport's FAA 5010 Form and are also listed in on airnav.com/airport/KVCB. These remarks state "no turns to crosswind below 800 feet MSL; noise sensitive area west of the Airport". The Airport also has a published non-standard right hand traffic pattern to Runway 20 in an effort to reduce over-flights of noise sensitive land uses located south of the Airport and Interstate 80, and sensitive land uses located to the west of the Airport.

Airport Environs

An understanding of the existing land uses, zoning patterns, and the various land use planning and control documents used to guide development of property surrounding the Airport is an important element in the airport planning process.

Nut Tree Airport is located in the northwest portion of Solano County within the City of Vacaville. The land uses associated with the immediate areas surrounding the Airport are generally industrial, business park, commercial, and public park/recreational land uses. Because the operation of an airport influences surrounding land use and surrounding land use has an influence on the operation of an airport, it is critical in any airport planning study to gain an understanding of existing and proposed land use types in the area near the Airport. The following text and illustrations describe zoning and land use in the airport environs.

Zoning

Zoning is the public regulation of the use of land. It involves the adoption of ordinances that divide a community into various districts or zones. Each district will allow a certain use of land within that zone, such as residential, commercial, and industrial (and many others). Typical zoning regulations address things such as the height of a building, number of people that can occupy a building, a lot area, setbacks, parking, signage, and density.

The City of Vacaville 2008 *Zoning Map*, developed by the Community Development Department, classified areas to the west of the Airport as Community Facilities, and Open Space; Industrial Park and Community Facilities to the north; Business Park and General Commercial to the east; and, General Commercial, and General Commercial with a Residential Overlay district to the south of the Airport. The City of Vacaville *Zoning Map* also classifies the Airport as Community Facility. Existing zoning within the vicinity of the Airport is illustrated below on the following figure entitled *GENERALIZED EXISTING ZONING*.

Land Use

Nut Tree Airport currently occupies 262 acres of land within the city limits of Vacaville. The Airport, in its entirety, is owned by Solano County. According to the *Land Use Plan Element* (Chapter 2) in the City of Vacaville's 2007 *General Plan*, the Airport is bounded to the west by a local public park, open space, and a small portion of industrial park land uses; to the north by mostly industrial park development; to the east by I-505, business park, and commercial development; and, to the south by I-80, commercial/highway, and commercial development land

uses. Airport property is designated public/institutional. Similarly, the Airport is designated as a public/quasi-public land use in the 2008 Solano County *General Plan Land Use Diagram*[6].

Guiding land use policies described in the 2007 City of Vacaville *General Plan* focus on Urban Service Area development within an established "Growth Boundary" until March 2028. Nut Tree Airport is located within the City of Vacaville's 20-year Urban Service Area boundary[7]. Further, the 2007 *General Plan* indicates that areas within the City where significant land use changes or major projects may be considered will have required policy plans. Nut Tree Airport falls under the Airport Business Area Policy Plan within the 20-year Urban Service Area Boundary. As stated in the 2007 City of Vacaville *General Plan*, *"land use changes and development proposals within the Vacaville planning area shall be consistent with the Nut Tree Airport Land Use Plan"*, and *"are subject to review per the Solano County Airport Land Use Compatibility Review Procedures"*. Nut Tree Airport land use compatibility requirements are described in the following sections.

[6] The Solano County Land Use Plan (as depicted on the *Land Use Diagram*) provides guidance for future County growth and the resources conserved through 2030.

[7] City of Vacaville *General Plan*, Chapter 2, *Land Use Element*, 2007.

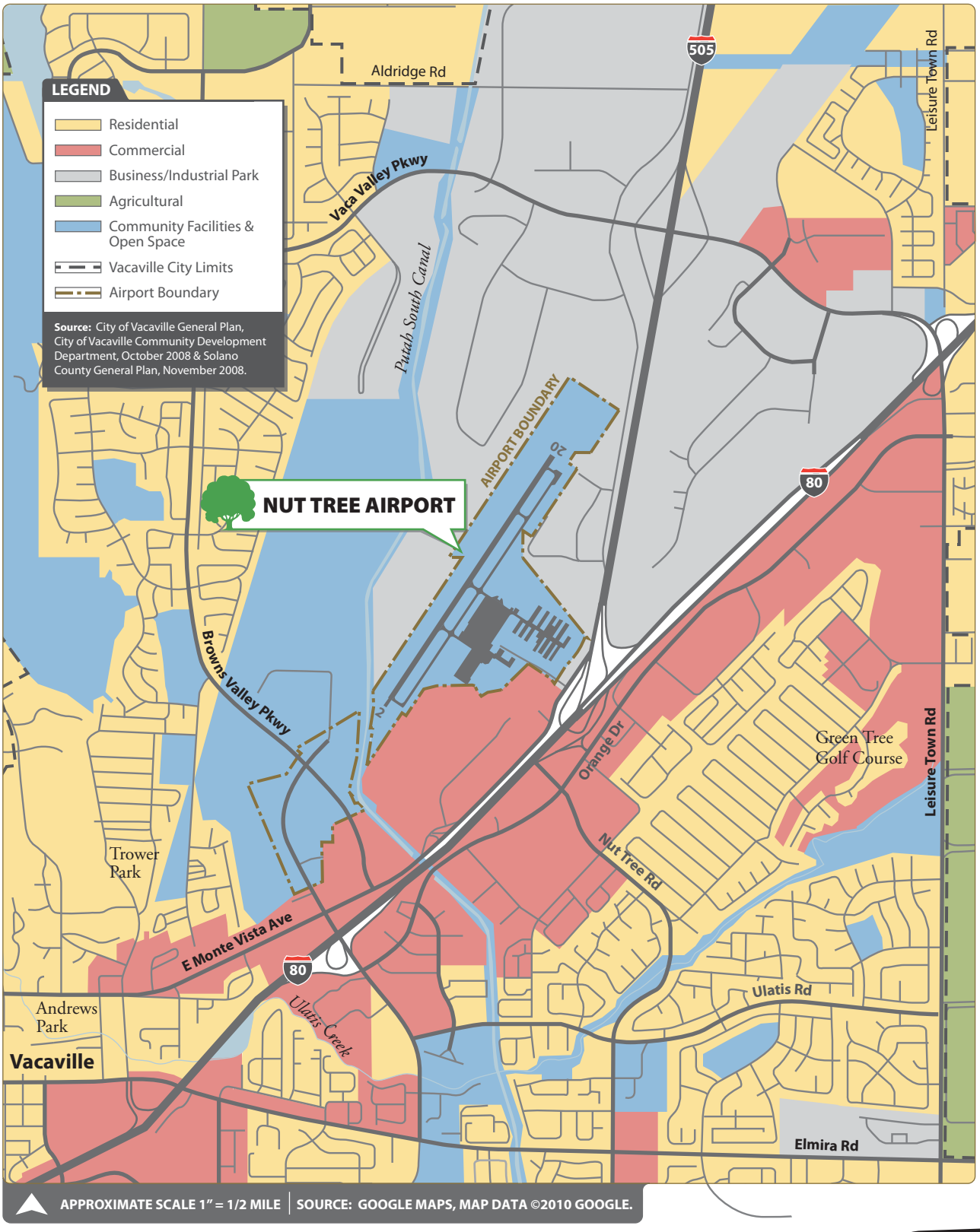

FIGURE B5 Generalized Existing Zoning

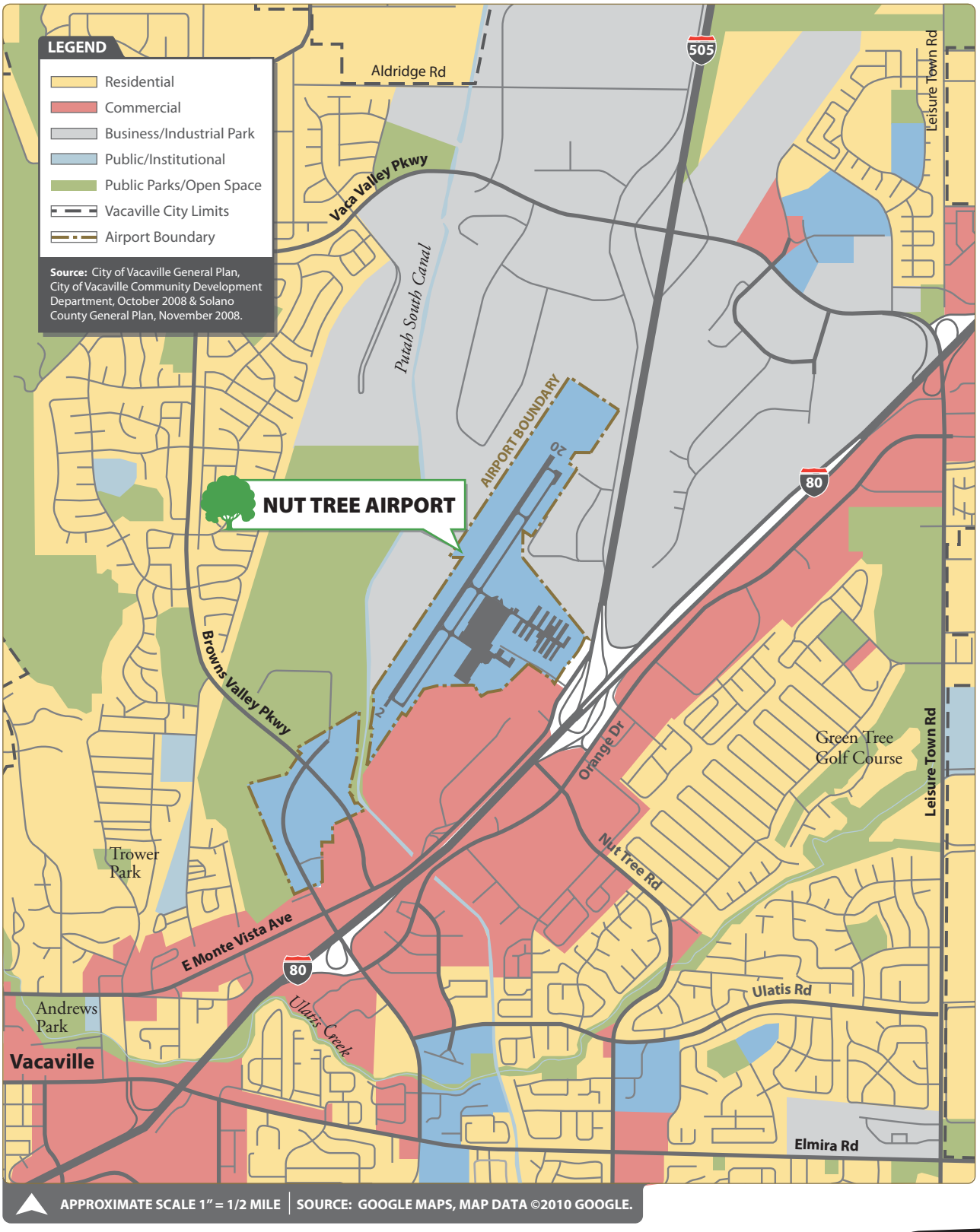

FIGURE B6 Generalized Land Use

Nut Tree Airport/Land Use Compatibility Plan

The State of California Public Utilities Code (under the California *State Aeronautics Act*) requires the creation of an Airport Land Use Commission (ALUC), which is responsible for developing a land use compatibility plan for each county's public use airport. The Solano County ALUC oversees and adopts land use compatibility planning standards to prevent land use conflicts and facilitate compatible development within the airport environs. Solano County airport land use compatibility plans address current airport facilities throughout the County, which include Nut Tree Airport, Rio Vista Municipal Airport, and Travis AFB.

The purpose of the 1988 *Airport/Land Use Compatibility Plan* (ALUCP) for Nut Tree Airport is to set forth the criteria which the ALUC will use in evaluating land use plans and proposed development in the vicinity of Nut Tree Airport[8]. It is the purpose of the ALUC's review to assure that future action involving land uses in the environs of the Airport take into account the need for compatibility with airport activities. The ALUC has no authority over existing land uses even if such uses are considered incompatible with airport activity. Also, the ALUC has no authority over the operation of the Airport and the ALUC is concerned only with the safety, overflight impacts, and airspace protection requirements of the Airport. Other impacts sometimes created by the operation of an airport (e.g. air pollutants, automobile traffic, etc.) are not topics of concern.

The 1988 ALUCP defines the airport compatible land use zones[9] around the Airport, as shown in the following figure, entitled *AIRPORT LAND USE COMPATIBILITY ZONES*. New development in these zones must be compatible with the plan. The six compatibility zones, the associated impact element, maximum densities, and required percentage of open space are described in the following table, entitled *AIRPORT LAND USE COMPATIBILITY CRITERIA*. The 1988 ALUCP also includes supporting policies related to aircraft noise, airspace protection, and aircraft overflights[10].

Following the completion of the *Development Concepts and Alternatives Analysis* chapter of this Airport Master Plan, a review of the 1988 airport land use zones and compatibility criteria will be completed to determine if changes are necessary. The land use zones and compatibility will also

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[8] *Nut Tree Airport/Land Use Compatibility Plan*, May 1988.

[9] Identified as the "Compatibility District Boundary" in the City of Vacaville *General Plan* (Figure 6-4, *Airport Land Use Compatibility Districts*, 2007), and as the "Airport Influence Area" in the Solano County *General Plan* (Figure LU-6, *Airport Influence Areas*).

[10] Overflights are defined by the FAA as a terminal instrument flight rules (IFR) that originated outside the TRACON/RAPCON/Radar Airport Traffic Control Tower's area, passing through the area without landing. http://aspmhelp.faa.gov/index.php/Glossary.

be reviewed to determine consistency with the latest *California Airport Land Use Planning Handbook*, published in January of 2002. It is also important to note that any recommended changes to the 1988 airport land use zones and compatibility criteria should be considered and incorporated into both the City of Vacaville and the Solano County General Plans, as well as in the Vacaville Municipal Code.

Table B4
AIRPORT LAND USE COMPATIBILITY CRITERIA

	Airport Compatibility Zone					
	A	**B**	**C**	**D**	**E**	**F**
Location	Clear Zone or Primary Surface	Inner Approach/ Departure Zone	Outer Approach/ Departure Zone or Adjacent to RW	Extended Approach/ Departure Zone	Adjacent to RW or Final Approach	Other Airport Environs
Impact Elements						
Risk	High Risk	Substantial Risk *-Low OFs along extended RW centerline*	Moderate Risk *-Routine OFs on IFR approach or <400 ft AGL* or *-Few OFs, but close to RW edge*	Moderate Risk *-Common traffic pattern OF <800 ft AGL*	Limited Risk	OFs, Limited Risk *-Under flight paths*
Noise	High Noise	High Noise	Substantial Noise	Frequent Noise Intrusion	Minor to Significant Sideline Noise	N/A
Maximum Densities						
Residential *(DU/acre)*[1]	0	0.3	1	4	6	-
Other Uses *In Structures* **(People/Acre)**[2] *Total In and Out of Structures*	10 15	20 40	50 75	100 150	- -	-[3] -
Required Open Land	65%	50%	15%	10%	-	-

Source: *Airport/Land Use Compatibility Plan*, *Nut Tree Airport*, Solano County Airport Land Use Commission, 1988.

Notes:

RW = Runway OF = Overflight AGL = Above Ground Level DU = Dwelling Unit N/A = Not Applicable

[1] The residential development should not contain more than the indicated number of dwelling units per gross acre. Units can be clustered to meet open land criteria. Maximum net density in any area should not exceed three times the acceptable gross density.

[2] The use should generally not attract more than the indicated number of persons per net acre. These densities are intended as general planning guidelines to aid in determining the acceptability of proposed land uses. Jurisdictions may satisfy density standards through adoption of an implementing plan or ordinance which is determined by the Airport Land Use Commission to meet the standards.

[3] Under flight tracks captive groups should not exceed 100 persons/structure; large assemblages should not exceed 300 persons, where grouped in close proximity, i.e., theaters, auditoriums, conference facilities, etc.

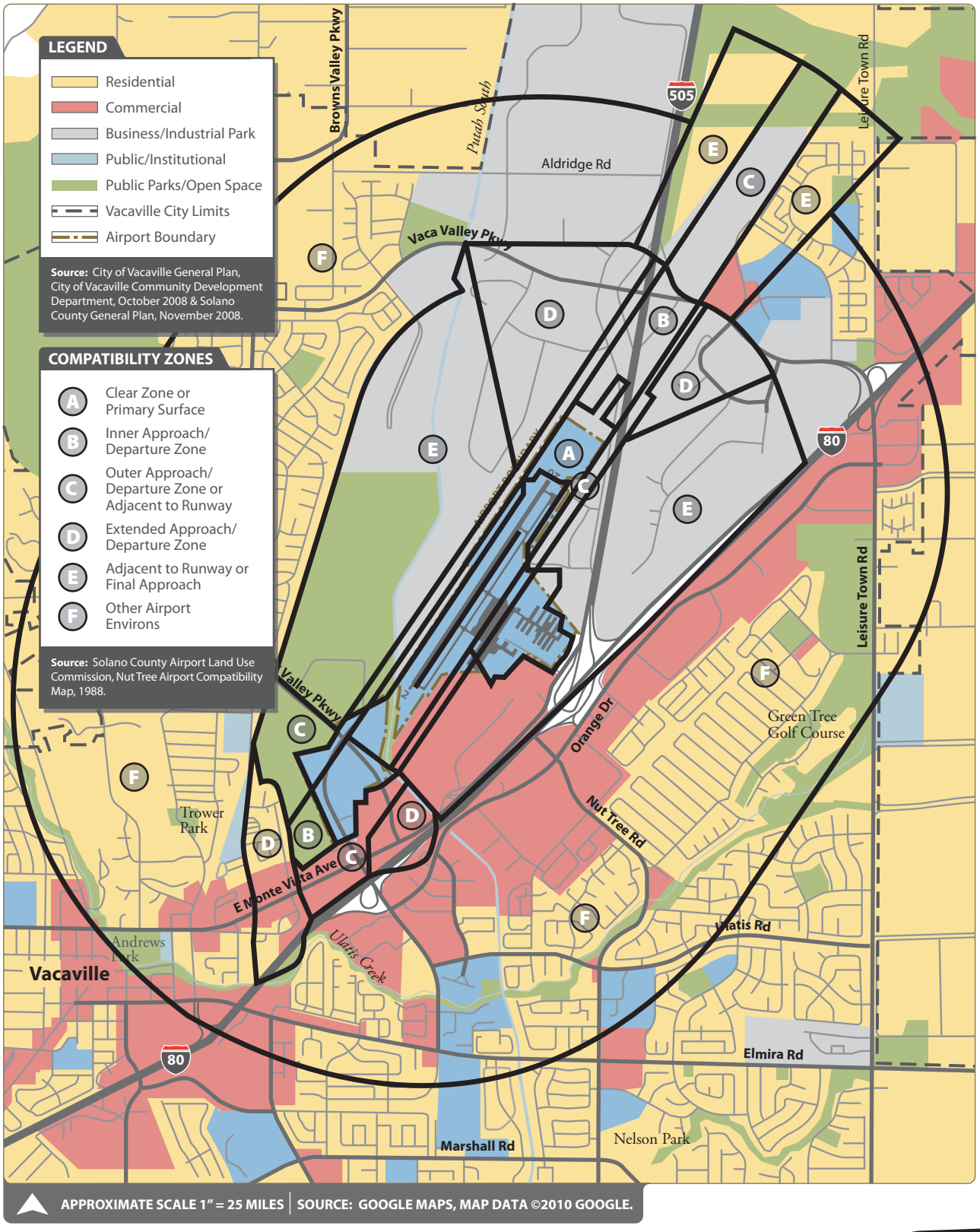

FIGURE B7 Airport Land Use Compatibility Zones

Noise, Airspace Protection, and Overflight

The 1988 ALUCP also includes supporting policies related to aircraft noise, airspace protection and aircraft overflights. Each of these supporting policies is described below.

Noise. The California Code of Regulations, Title 21, Subchapter 6 indicates that the State of California prohibits four land use types to be located within the 65 decibel (dB) CNEL exposure level, which include public and private schools, places of public worship, residential dwellings, and hospitals. In order to enforce these noise regulations, each airport is required to develop a noise exposure map delineating the 65 dB CNEL noise contour location. Noise policies described in the 1988 ALUCP indicates that the maximum CNEL which shall be considered normally acceptable for residential areas in the vicinity of Nut Tree Airport is 60 rather than 65[11]. Also, the 2007 City of Vacaville *General Plan* and the Vacaville Municipal code have also adopted the 60 dB CNEL noise level as the residential compatibility threshold. The noise contours illustrated in the 2007 *General Plan* are based upon the 1993 Nut Tree Airport *Master Plan* 2011 future noise contours. These contours were anticipated to be incorporated into the 1988 ALUCP; however, the 2007 *General Plan* indicates that the 1988 ALUCP has not been amended to incorporate the 1993 Nut Tree Airport *Master Plan* noise contours.

As stated above, the State of California restricts the four incompatible land uses within the 65 CNEL exposure level. Further analysis and potential recommendations for changes to adopted noise contours will be included in later chapters of this Master Plan. The 2011 55, 60, and 65 CNEL noise contours based upon the 1993 *Master Plan* are presented in the following figure, entitled *2011 CNEL NOISE EXPOSURE LEVELS*. It is important to note that these 2011 noise contours are based on a forecast included in the 1993 Airport Master Plan of 180,000 annual aircraft operations. Actual 2009 aircraft operations were estimated to be 101,500.

Airspace Protection. The 1988 ALUCP and the City of Vacaville *Municipal Code*, Chapter 14.09.134, *Supplemental Standards, Airport, Helistop, and Heliport Land Use Compatibility* both establish standards and policies for the protection of airspace in the vicinity of Nut Tree Airport. These policies are intended to restrict hazardous encroachments into defined airport operational areas, including airspaces, and to protect public safety, health, and welfare, as well as property in the vicinity of the Airport from "unreasonable hazards or impacts associated with airport operations".

[11] 1988 Nut Tree Airport/Land Use Compatibility Plan

As indicated in the 1988 ALUCP, height limits are established within the airport compatible land use zones, consistent with FAA Federal Aviation Regulation (FAR) Part 77, *Objects Affecting Navigable Airspace*. Airport height limitations can prevent objects such as utility towers, cellular phone antennas, and buildings from penetrating any of the identified imaginary surfaces defined in the FAR Part 77.

Overflights. The 1988 ALUCP includes supporting policies related to aircraft overflights, particularly of residential areas in the vicinity of the Airport. The overflight policies require overflight easements as a condition of development and encourage local governments to establish "buyer notification statements" as a requirement for the transfer of title of any property within the airport land use compatibility zones. The purpose of the buyer notification statement is to inform the purchaser of the property of its proximity to the Airport and the associated likelihood of aircraft overflights of the affected property.

FIGURE B8 2011 CNEL Noise Exposure Levels

Environmental Conditions Inventory

The consideration of environmental factors during the airport planning process is necessary to provide direction for the Master Plan alternatives development and to provide the Airport Sponsor with enough information to help expedite any subsequent environmental processing that may be required in support of airport development projects. Brief descriptions of the various environmental resource categories are presented below.

Air Quality

The Yolo-Solano Area Air Quality Management District (YSAQMD) is primarily responsible for regulating air pollution emissions from stationary sources (e.g., factories) and indirect sources (e.g., traffic associated with new development), as well as for monitoring ambient pollutant concentrations. The California Air Resources Board (CARB) [a division of the California Environmental Protection Agency (CEPA)] and the U.S. Environmental Protection Agency (EPA) regulate direct emissions from motor vehicles.

The EPA has established National Ambient Air Quality Standards (NAAQS) for six criteria air pollutants: carbon monoxide (CO), ozone (O3), particulate matter (PM10), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), and lead (Pb). According to the EPA, the Vacaville area is currently in compliance with all NAAQS. The closest non-attainment area is Sacramento, California (metro area) which is approximately 32 miles from the Airport. Generally, the FAA uses the number of passengers and number of aviation operations as an indicator of potential air quality concerns. These numbers help decide whether the project requires further air quality analysis. The FAA *Environmental Desk Reference for Airport Actions* states that,

"If the proposed airport action would occur at an airport having a total of 180,000 general aviation and air taxi annual operations, an air quality analysis is required."

The forecast operations by the end of the 20-year planning period are expected to remain well below the 180,000 operations threshold required to do an air quality analysis.

In addition, the CARB has established California Ambient Air Quality Standards (CAAQS) for ten criteria pollutants, which includes the six air pollutants subject to NAAQS, as well as particulate matter PM2.5[12], sulfates (SO_4^2), hydrogen sulfide (H_2S), vinyl chloride, and visibility reducing particles. The CARB annually updates State area designation maps, as required by the

[12] Fine suspended particles 2.5 microns or less in diameter. http://www.arb.ca.gov/research/aaqs/caaqs/pm/pm.htm. CAAQS also includes PM10, suspended particulate matter of 10 microns or less in diameter (also defined as respirable particulate matter).

California *Health and Safety Code*, Section 39608. Results of air quality data monitored from 2006 to 2008 for Solano County is presented in the following table.

Table B5
2010 SOLANO COUNTY CAAQS AIR POLLUTANT DESIGNATIONS

CAAQS Air Pollutant	Solano County Designation
Suspended Particulate Matter (PM10)	Nonattainment
Fine Suspended Particulate Matter (PM2.5)	Unclassified
Ozone (O_3)	Nonattainment
Nitrogen Dioxide(NO_2)	Attainment
Sulfates (SO_4^2)	Attainment
Carbon Monoxide (CO)	Attainment
Sulfur Dioxide (SO_2)	Attainment
Visibility Reducing Particles	Unclassified
Lead (Pb)	Attainment
Hydrogen Sulfide (H_2S)	Unclassified

Source: California Air Resources Board (CARB), 2010 State Area Designations. http://www.arb.ca.gov/desig/adm/adm.htm .

Notes: Results represent air quality based on 2006 to 2008 monitoring data.

Unclassified = Incomplete data/does not support designation of attainment or nonattainment.

Attainment = Pollutant did not violate a State standard at any site in within the designation area during the three-year period.

Nonattainment = Pollutant violated at least one State standard within the designation area.

Short-term air quality impacts may be expected from temporary construction activities such as heavy equipment pollutant emissions, fugitive dust resulting from cut and fill activities, and the operation of portable concrete batch plants. Compliance with all applicable local, state, and federal air quality regulations and permitting requirements will be the responsibility of all contractors. Further, an Authority to Construct, as well as an Air District Operating Permit from the Yolo-Solano Area Air Quality Management District may be required for construction projects at the Airport.

Specific questions related to environmental issues and actual proposed construction projects will be addressed in the Implementation Plan chapter. Contractors doing work at the Airport will be required to follow guidelines outlined in the FAA's Advisory Circular (AC) 150/5370-10A, *Standards for Specifying Construction of Airports*, which is the FAA's guidance to airport sponsors concerning protection of the environment during construction. The final plans and

specifications for any project will incorporate the provisions of AC 150/5370-10A to ensure minimal impact due to erosion, air pollution, sanitary waste, and the use of chemicals.

Water Quality

The quality of surface water and groundwater in the vicinity of the Airport is affected by past and current land uses at the site and within watersheds[13], and the composition of geologic materials in the vicinity. Water quality in surface and groundwater bodies is regulated by the California State Water Resources Control Board (SWRCB), and Nut Tree Airport is under the jurisdiction of the Central Valley Regional Water Quality Control Board (RWQCB), which is responsible for implementation of State and federal water quality protection guidelines in the Central Valley region. The RWQCB implements the Water Quality Certification (WQC) program, which manages water quality issues in the region in order to protect wetland resources, such as vernal pools, rivers, and streams.

Grading and excavation activities for individual development projects could result in exposure of soil to runoff, potentially causing erosion and entrainment of sediment in the runoff. Soil stockpiles, cuts, and fills could be exposed to runoff and, if not managed properly, the runoff could cause erosion and increased sedimentation in storm sewers or drainages at or outside the project site. There is also a potential for chemical releases at most construction sites. Once released, substances such as fuels, oils, paints, and solvents could be transported to nearby drainages, and/or groundwater in storm water runoff, wash water, and dust control water, potentially reducing the quality of receiving waters. Water pollution is regulated by the National Pollutant Discharge Elimination System (NPDES) by regulating point sources (i.e. man-made ditches and pipes) that discharge pollutants into waters of the U.S. [established through the *Clean Water Act* (CWA)]. Construction projects at the Airport will require a NPDES permit, issued by the Central Valley RWQCB.

In addition to compliance with the provisions of the NPDES permit, development projects at the Airport should confirm with the Central Valley RWQCB whether construction projects require a Construction Activities General Storm Water Permit. Developing and implementing a Storm Water Pollution Prevention Plan (SWPPP), including storm water Best Management Practices (BMPs) (designed to reduce potential impacts to surface water quality during the construction of the project) may also be required for compliance of future airport development projects.

Historical, Architectural, Archaeological, and Cultural Resources

[13] Solano County crosses three watersheds, the Lower Sacramento Watershed, Suisun Bay Watershed, and the San Pablo Bay Watershed. http://cfpub.epa.gov/surf/county.cfm?fips_code=06095.

Section 106 of the *National Historic Preservation Act* requires federal agencies, or their designated representatives, to take into account the effects of their undertakings on historic properties, which include archaeological sites, buildings, structures, objects, or districts. Several sites in Vacaville are listed on the National Register of Historic Places (NRHP), but, none of these sites are close to airport property.

Prior to any future airport projects on previously undisturbed land, the California State Parks Office of Historic Preservation will need to be contacted. Additionally, should any construction activity expose buried archaeological resources; work would stop in that area and both the FAA and the Office of Historic Preservation will be contacted.

Threatened, Endangered, and Special-Status Species

The *Endangered Species Act*, as Amended, requires each federal agency to ensure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of habitat of such species. Additionally, the *California Endangered Species Act* (CESA) also requires early consultation to avoid potential impacts to threatened, rare, and endangered species in order to develop appropriate mitigation planning to prevent project-caused losses of these species.

In 2008, a survey of the Airport was conducted to determine the presence of threatened, endangered, and special-status species within the area in conjunction with the 2008 *Environmental Assessment* (EA)[14]. The majority of the species observed during the survey were a variety of bird species. While no amphibians or reptiles were observed during the survey, suitable habitat was identified as present on the site. Additionally, several small mammal species were identified during the survey. The following table entitled *THREATENED, ENDANGERED, AND SPECIAL-STATUS SPECIES* includes a list of the special status species potentially occurring on the Airport based on the results of this survey and review of the federal, state and local special status species list.

[14] An environmental assessment (EA) study was completed for Nut Tree Airport in May 2008 for land acquisition of approximately 141 acres.

Table B6
THREATENED, ENDANGERED, AND SPECIAL-STATUS SPECIES

Species	Status	Potential for Occurrence on Airport
Plants		
Baker's navarretia (*Navarretia leucocephala ssp. bakeri*)	List 1B	Present
Pappose tarplant (*Centromadia parryi ssp. parryi*)	List 1B	Moderate
Dwarf downingia (*Downingia pusilla*)	List 2	Moderate
Saline clover (*Trifolium depauperatum var. hydrophilum*)	List 1B	Moderate
Legenere (*Legenere limosa*)	List 1B	Low
Birds		
White-tailed kite (*Elanus leucurus*)	CFP	High
Swainson's hawk (*Buteo swainsoni*)	ST	Known to Occur
Loggerheaded shrike (*Lanius ludovicianus*)	CSC	Known to Occur
California horned lark (*Eremophila alpestris actia*)	CSC	Low
Cooper's hawk (*Accipiter cooperi*)	CSC	Low
Burrowing owl (*Athene cunicularia*)	CSC	Low
Invertebrates		
Vernal pool fairy shrimp (*Branchinecta lynchi*)	FT	Low
Vernal pool tadpole shrimp (*Lepidurus packardi*)	FE	Low
Reptiles		
Pacific pond turtle (*Actinemys marmorata*)	CSC	Low

Sources: *Final Environmental Assessment for Land Acquisition at Nut Tree Airport*, 2008. [Includes sources from California Natural Diversity Database (CNDDB), and the *Inventory of Rare and Endangered Plants of California*, Tibor, 2001]

Notes:

FE – Federally-Listed as Endangered.
FT – Federally-Listed as Threatened.
ST – State-Listed as Threatened.
CFP – California Department of Fish and Game Fully Protected Species.
CSC – California Department of Fish and Game Species of Special Concern.
List 1B – California Native Plant Society – Plant considered rare, threatened, or endangered in California and elsewhere.
List 2 – California Native Plant Society – Plant considered rare, threatened, or endangered in California but more common elsewhere.

Before any projects could be undertaken, the Airport should coordinate with FAA to make an effect determination on these threatened, endangered, and special-status species. Depending on the anticipated level of effect or potential impact, an Environmental Assessment or Environmental Impact Statement may have to be prepared prior to project implementation.

Hazardous Wildlife Attractants

Retention and settling ponds, recreational use ponds, wastewater and storm water treatment facilities, ponds resulting from mining activities, drinking water intake and treatment, and landfill facilities can frequently attract large numbers of potentially hazardous wildlife, such as birds. The

Hay Road Landfill is located approximately 11 miles southeast of the Airport.

According to FAA Advisory Circular 150/5200-33B, *Hazardous Wildlife Attractants On or Near Airports*, the FAA recommends that minimum separation criteria be established between the air operations area (AOA) and certain land uses that can potentially attract hazardous wildlife. Any solid waste disposal facility (i.e. sanitary landfill) or water management facilities (i.e. wastewater treatment facilities, storm water management facilities, etc.) located within 5,000 feet of all runways planned to be used by piston-powered aircraft or within 10,000 feet of all runways planned to be used by turbine aircraft, is considered by the FAA to be an incompatible land use because of the potential for conflicts between bird habitat and low-flying aircraft.

Wetlands

Wetlands are basically defined as areas inundated by surface or groundwater with a frequency sufficient to support vegetation or aquatic life requiring saturated or seasonally saturated soil conditions for growth and reproduction. A formal wetland delineation for the entire Airport was completed in 2007 as part of the 2008 *Environmental Assessment*. The Airport contains approximately 9.72 acres of potential waters of the U.S., including two perennial streams, numerous seasonal wetlands, a flood detention basin, and six pools. Pine Creek and two branches of Horse Creek (Middle and South) are potential jurisdictional waters of the U.S., as are the additional seasonal wetlands and pools.

At the time of the 2008 EA, the Army Corps of Engineers determined that no permitting or regulatory action was required because the proposed action was land acquisition that would not result in the filling of any of these features. Under Section 404 of the CWA, prior to any work that may affect potential waters of the U.S., the Army Corps of Engineers will need to complete a jurisdictional determination and the Airport will need to obtain any necessary permits. Any airport development projects requiring federal permits under Section 404 of the CWA will also require Water Quality Certification from the Central Valley RWQCB. Should there be any mitigation measures identified, contractors would be required to follow guidelines outlined in the FAA's AC 150/5370-10A to minimize the impacts to the environment, including wetlands.

Farmland

According to the National Soil Survey by the National Resources Conservation Service (NRCS), there are several areas of land on and surrounding the Airport that are considered to be prime farmland. The majority of the north and south/southwest sections of land within airport property is composed of Corning gravelly loam, with two to 15 percent slopes, and is not considered to be prime farmland. A portion of the northeast section of airport property is

composed of San Ysidro sandy loam, with zero to two percent slopes, and is also not considered prime farmland. The central portion of the airport property is composed of Clear Lake clay, with zero to two percent slopes, and Capay silty clay loam, both of which soils are considered prime farmland if irrigated. All of these soils are located on airport property, and the soil analysis was generated through online mapping of the property from the Natural Resources Conservation Service (NRCS) website.

Consultation with the U.S. Department of Agriculture (USDA) and the NRCS is required to determine if the Farmland Protection Policy Act (FPPA) applies to the land or applies to any land to be converted from non-agricultural use as a result of any projects proposed in this Airport Master Plan. However, because most of the land that could be considered prime farmland is already committed to aeronautical use, it is unlikely that the FPPA would apply to projects within the current airport property line.

Floodplains

Executive Order 11988 directs federal agencies to take action to reduce the risk of flood loss, minimize the impact of floods on human safety, health, and welfare, and restore and preserve the natural and beneficial values served by floodplains. There are several 100-year floodplains within close proximity to and on the Airport. These floodplains are associated with the South Branch and Middle Branch of Horse Creek and a portion of Pine Tree Creek. The Middle Branch of Horse Creek lies to the north east of the runway end, while the South Branch of Horse Creek and the associated floodplain lies along the western side of the runway and to the south. Pine Tree Creek and the associated floodplain wraps around the southeastern end of the runway. According to FAA Orders 1050.1E and 5050.4B, the FAA must determine if there would be a "significant floodplain encroachment" should development occur within a floodplain. If development occurred that may cause an impact to the 100-year floodplain located near the Airport, consultation with the FAA would be required to determine if the significant encroachment will cause "notable adverse impacts on natural and beneficial floodplain values" as a result of any of the proposed projects.

Section 4 (f) Property

Section 4(f) of the Department of Transportation Act (recodified at 49 USC, Subtitle I, Section 303) provides that no publicly owned park, recreation area, wildlife or waterfowl refuge, or land of a historic site that is of national, state, or local significance will be used, acquired, or affected by programs or projects requiring federal assistance for implementation. Currently, there are no potential Section 4(f) resources within the immediate vicinity of the Airport.

FIGURE B9 Environmental Conditions Map

Financial Inventory

The primary goal of this task is to gather materials that summarize the financial management of the Airport. In addition, it is important to develop an understanding of the financial structure, constraints, requirements, and opportunities for airport activities as related to the development of a capital improvement program. The documents that have been gathered and reviewed for this financial inventory will be used to formulate a reasonable and financially sound Capital Improvement Program (CIP) with which to fund projects identified in the master planning process. With this in mind, the Airport's financial statements have been gathered for fiscal years (ending) 2005 to 2009. In addition, the Airport's current five-year CIP has also been reviewed.

The Airport is categorized as an "Enterprise" fund, which accounts for operations that are financed and operated similar to private business enterprises. As an enterprise fund, the costs of providing goods or services to the general public on a continuing basis are recovered primarily through user fees[15]. The review of the financial documentation for Nut Tree Airport indicates that the Airport is self-supporting between generated airport revenues and interest, operating, and other various revenues. As identified in the Solano County *Financial Budgets*, major sources of revenue for the Airport include: tax revenues, fuel sales, airport fees, and hangar and tie-down rentals; Major expenditures include: salaries and wages, gasoline, maintenance, materials and supplies, utilities, other/miscellaneous, depreciation, and, interest expenses.

Table B7
REVENUE AND EXPENSE SUMMARY, 2004-2009

Fiscal Year[1]	*Total Revenues*[2]	*Total Expenses*[2]	*Total Net Gain/Loss*
2004 – 2005	$2,517,149	$1,127,038	$1,390,110
2005 – 2006	$1,501,425	$1,513,219	($11,795)
2006 – 2007	$4,367,317	$1,721,170	$2,646,147
2007 – 2008	$3,890,691	$2,096,023	$1,794,667
2008 – 2009	$3,937,158	$2,274,128	$1,663,030

Source: Solano County Finance Reports, Final Budgets, Fiscal Years (ending) 2005 to 2009.

Notes: Does not include Enterprise Fund 310 – Special Aviation.

[1]The Solano County Fiscal Year is a twelve-month period, ending June 30th.
[2]Includes operating and non-operating.

Some of the improvements indicated in the current five-year CIP for the Airport include:

[15] County of Solano, *Final Budget*, 2009/10, page 1.

- **Land acquisition or easement for approach and easement protection (north and southeast sides of the Airport)**
- **Land acquisition (approximately 73 acres) for approach protection (northwest side of the Airport)**
- **Airfield pavement rehabilitation**
- **Airfield lighting and signage improvements (associated with airfield pavement rehabilitation)**
- **Obstruction removal**
- **Airport perimeter fencing**
- **Taxilane and hangar development**
- **Apron and helicopter parking improvements**
- **Runway and parallel taxiway extension**

The Airport's current CIP covers five years and programs a total estimated expenditure of $34,756,000; with the local share being $1,880,250 and the federal share being approximately $32,875,750.

Summary

The goal of this chapter is to provide general background information pertaining to the Airport, its aviation-operating environment, its physical surroundings, and its financial situation. The *Inventory of Existing Conditions* chapter is vital from the standpoint that it will be used as a reference in the analysis and design process that is required to prepare the Airport's future development plan.

Forecasts of Aviation Activity

INTRODUCTION. Forecasting is a key element in the master planning process. The forecasts are essential for analyzing existing airport facilities and identifying future needs and requirements of the facilities. Forecasting, by its very nature, is not exact, but it does establish some general estimates for future aviation activity levels and provides a defined rationale for potential changes at airports as demands increase. The amount and kind of aviation activity occurring at an airport are dependent upon many factors, but are usually reflective of the services available to aircraft operators, the meteorological conditions under which the airport operates (daily and seasonally), the businesses located on the airport or within the community the airport serves, and the general economic conditions prevalent within the surrounding area.

Aviation activity forecasting generally commences by utilizing the present time as an initial point and baseline, supplemented with historical trends obtained from previous years' activity and recorded information. This data has evolved from a comprehensive examination of historical

airport records from airport personnel, FAA Form 5010-1, *Airport Master Record* data, FAA Terminal Area Forecasts (TAF), and the *FAA Aerospace, Forecasts Fiscal Years 2010-2030*. These documents were assembled in different years, making the base year data quite variable, and emphasizing the need for establishing a well-defined and well-documented set of base information from which to project future aviation activity trends.

Prior to an examination of current and future activity levels at the Airport, there are conditions and assumptions that should be noted that form the basis or foundation for the development of the forecasts contained here. These variables represent a variety of physical, operational, and socioeconomic considerations, and, to varying degrees, relate to and affect aviation activity at Nut Tree Airport.

Socioeconomic Conditions

Historically, the socioeconomic conditions of a particular area affect aviation activity within that region. It is usually helpful to incorporate an analysis of local and regional socioeconomic data into the forecast for future aviation demands at an airport. Typically, the most often analyzed indicators are population, employment, and income. Socioeconomic data was obtained from recognized sources, including local, regional, state, and federal planning organizations.

Population. The existing socioeconomic condition of a particular region has historically impacted aviation activity within that area. The two primary socioeconomic indicators, which are often analyzed in the forecast of aviation activity, are population and employment statistics. Solano County is strategically located 45 miles from San Francisco and 45 miles from the state capital of Sacramento. The County covers 909.4 square miles, including 84.2 square miles of water area and 675.4 square miles of rural land area. According to the *California Department of Finance*, the average population increase for the cities of Vacaville and Fairfield from 2000 to 2009 was 0.95 percent per year and 1.14 percent per year respectively. During this same time period, the population of Solano County is estimated to have increased from 394,930 to 426,729, an average of 0.87 percent per year. However, the rate of population growth in the area has slowed in recent years in response to the 2008 economic recession. From 2005 through 2009, the cities of Vacaville and Fairfield increased at the rate of 0.28 percent per year and 0.60 percent per year, respectively, while Solano County's population increased at a rate of 0.50 percent per year.

Table C1
HISTORICAL AND FORECAST POPULATION, 2000-2030

	City of Vacaville	City of Fairfield	Solano County
2000	88,642	96,178	394,930
2005	96,195	104,079	418,876
2009	96,450	106,440	426,729
2010	---	---	441,061
2020	---	---	503,248
2030	---	---	590,166

Sources: State of California, Department of Finance, E-4 Population Estimates for Cities, Counties and the State, 2001-2009, with 2000 Benchmark. Sacramento, California, May 2009. State of California, Department of Finance, Population Projections for California and Its Counties 2000-2050, by Age, Gender and Race/Ethnicity, Sacramento, California, July 2007.

Employment and Income. According to the U.S. Census Bureau, Solano County median household income (in 2008 inflation adjusted dollars) was $68,603, while median family income was $77,162. There were approximately 204,561 persons in the County's labor force in 2008, and the mean travel time to work was estimated at 29.8 minutes. A large portion of the County's employment force commutes outside of County lines to work. However, due to the declining economy in 2008 and 2009, as of March 2010, the County's unemployment rate has climbed to 9.7 percent, according to the California Employment Development Department.

Community Support. Nut Tree Airport benefits from the support of the surrounding communities, as well as local industry and residents. The Airport is recognized as a vital county asset, which contributes to the stability and the future of the area's economy. The overall position of the County is one of continued growth and development, with a recognized focus that Nut Tree Airport assists in maintaining and attracting additional economic and aviation-related development to the area.

Economy. Solano County has suffered job losses, but it has done so at a slightly lower rate than the state as a whole. The area's diversified economy has helped buffer the region. While some industries, such as construction, have been hit hard, others, such as health services, have grown. California's two-year recession ended in the fourth quarter of 2009 - lagging several months behind the U.S., according to the Business Forecasting Center at the University of the Pacific. It is expected that Southern California will lead the early stages of a sluggish recovery as many areas of Northern California will not emerge from recession until the spring or summer of 2010.

Historical Airport Activity Summary

With no on-site air traffic control tower facilities, there are limited historical records that provide accurate information concerning the historical aviation activity present at Nut Tree Airport. Historical FAA Form 5010-1's for the Airport show operations estimates as high as 144,000 per year in the 1980s and 1990s. However, recent operations levels are estimated to have remained fairly steady at just over 100,000 per year as reported in the FAA Terminal Area Forecast (TAF) for the Airport. The TAF system is the official forecast of aviation activity at FAA facilities. The TAF is prepared to meet the budget and planning needs of FAA and provide information for use by state and local authorities, the aviation industry, and the public. The TAF includes forecasts for:

- **FAA towered airports**
- **Federally contracted towered airports**
- **Nonfederal towered airports**
- **Non-towered airports**

For non-towered general aviation airports like Nut Tree Airport, the FAA uses data from the 5010-1 form to develop baseline levels of aircraft operations. FAA has less confidence in operations data from 5010-1 reports, as opposed to counting of operations by a staffed control tower or an activity counter. Consequently, lacking better baseline data, the TAF often assumes a zero percent growth rate when forecasting future operations at non-towered general aviation airports. A tabulation of the best available historical aviation activity information since 2000 is presented in the following table, entitled *HISTORICAL AVIATION ACTIVITY, 2000-2009*.

Table C2
HISTORICAL AVIATION ACTIVITY, 2000-2009

Year	Total Aircraft Operations[1]	Based Aircraft				
		Single Engine[2]	Multi-Engine[2]	Jet[2]	Helicopter[2]	Total Aircraft
2000	101,500	237	11	1	1	250[1]
2001	101,500	234	11	1	1	247[1]
2002	101,500	233	11	2	1	247[1]
2003	101,500	231	12	3	1	247[1]
2004	101,500	231	12	3	1	247[1]
2005	101,500	187	12	6	1	206[2]
2006	101,500	184	12	7	2	205[2]
2007	101,500	192	14	5	2	213[2]
2008	101,500	175	14	5	3	197[2]
2009	101,500	179	14	5	3	201[2]

Sources: [1] FAA *Terminal Area Forecast Detail Report*, December 2009.
[2] FAA Form 5010-1, *Airport Master Record*, and Solano County Assessor Records.

Historical Fuel Sales

Solano County has been operating and managing the fuel concession at Nut Tree Airport for the past few years. As indicated in the following table entitled *HISTORICAL FUEL SALES, 2006-2009*, over the last four years total gallons of 100 low lead (LL) sold have decreased by approximately 10 percent while total gallons of Jet-A sold have increased by over 72 percent. This trend is common at general aviation airports nationally as use of larger, faster aircraft for business aviation has been increasing at a much faster rate than private and recreational aircraft use. Also, as shown in the following table, the number of Jet-A fuel sales decreased from 2008 to 2009, while the total of Jet-A gallons sold increased. This is an indication that either larger, faster aircraft are using Nut Tree Airport or that aircraft are flying longer stage lengths.

Table C3
HISTORICAL FUEL SALES, 2006-2009

Year	Number of Sales			Number of Gallons		
	100 LL	Jet-A	Total	100 LL	Jet-A	Total
2006	4,820	388	5,208	82,051	88,089	170,140
2007	3,659	462	4,121	72,885	90,978	163,683
2008	3,006	573	3,579	66,220	121,328	287,548
2009	3,402	526	3,928	73,382	151,905	225,287

Source: Fuel records provided by Nut Tree Airport personnel.

Existing Operations by Aircraft Type

According to airport personnel, over 88 percent of all airport operations are conducted by single engine, piston driven aircraft. The following table, entitled *EXISTING OPERATIONS BY AIRCRAFT TYPE, 2009*, indicates the percentage of operations for each aircraft type.

Also, according to the FAA TAF, less than one percent of the total operations at Nut Tree Airport are classified as air taxi operations. An air taxi operation, as defined by FAA, is an operation by an aircraft designed to have a maximum seating capacity of 60 seats or less or a maximum payload capacity of 18,000 pounds or less carrying passengers or cargo for hire or compensation on demand (i.e. no schedule). Air taxi operations are regulated by Federal Aviation Regulations (FAR) Part 135. Section 135.385 of this regulation requires turbine engine-powered large transport category airplanes (aircraft weighing over 12,500 pounds) be able to make a full stop landing within 60 percent of the effective length of each runway. This restriction on air taxi use by large aircraft likely limits most of the estimated 1,500 annual air taxi operations to smaller single and multi-engine piston and turbo-prop type aircraft at Nut Tree Airport.

The existing aircraft operations at Nut Tree Airport are conducted for a wide variety of purposes including, but not limited to, business travel, government agency travel, personal flying, recreational flying, flight training, prisoner transport, drug enforcement activity, and medical transport.

Table C4
EXISTING OPERATIONS BY AIRCRAFT TYPE, 2009

Aircraft Type	Operations	Percentage[1]
Single Engine	89,600	88.28%
Multi-Engine Piston	4,800	4.73%
Turboprop	2,420	2.38%
Business Jet	3,420	3.37%
Helicopter	1,250	1.23%
Military	10	0.01%
Total Operations	**101,500**	**100%**

Source: [1] Nut Tree Airport personnel.

Notes: Represents the approximate total percentage of operations at Nut Tree Airport.

Aviation Activity Forecasts

Prior to the development of aviation activity forecasts, several factors that have an influence on the aviation industry, either positive or negative, should be considered in the planning process.

Factors and Conditions

Despite recent economic challenges in Solano County and the region, activity at Nut Tree Airport has remained fairly consistent. A large percentage of both itinerant and local operations at the Airport are attributable to the Japan Air Lines (JAL) flight crew training center at the Napa County Airport. JAL uses Nut Tree Airport for flight training utilizing a variety of single and multi-engine piston aircraft. However, in January of 2010, JAL filed for bankruptcy protection under a $10 billion turnaround plan after four Japanese government bailouts failed to revive the airline. JAL has stated publicly that the airline will continue operations but shed staff, cut unprofitable routes and retire older aircraft. It is currently unknown how the bankruptcy will change how the airline trains pilots or if they will continue to operate at the Napa County Airport and Nut Tree Airport.

It is also important to note that the overall condition of the general aviation industry in the United States, since 1978, has been in significant decline. The FAA identified several factors that have contributed to this prolonged downturn. These factors include three economic recessions, two fuel crises, the enactment of the *Airline Deregulation Act of 1978*, the expiration of the GI Bill, and the repeal of the investment tax credit.

Other causes of this downturn include the expense of owning and operating aircraft (i.e., the cost of insurance, fuel, and maintenance), competition from commuter airlines in the more open aviation market since airline deregulation, changes in disposable discretionary income, increases in airspace restrictions affecting fair-weather flying, reductions in personal leisure time, and shifts in personal preference as to how leisure time is spent. In particular, these factors have severely restricted the single engine light aircraft segment of the industry. In response to this downturn, the general aviation industry has been focusing more on the business aircraft operator and less on the recreational operator.

Nationally, the business jet component of general aviation is growing at a much faster rate than other aspects of the industry. The growth of this sector, which was statistically significant to begin with, was advanced even more by the events of September 11, 2001. In the post-9/11 environment, the speed and efficiency of business jet travel has created large dividends for the

corporate community in terms of offering greater schedule flexibility over the commercial air carriers and less aggravated security considerations.

The growth in the amateur-built aircraft market and the strength of the used aircraft market indicate that demand for inexpensive personal aircraft is still strong. Also, the FAA's recent sport pilot rule and light sport aircraft (LSA) category has generated renewed interest in recreational flying. The FAA is projecting LSA sales to grow by 825 through 2013.

Increased general aviation instrument operations at FAA towered airports, and general aviation aircraft handled at FAA en route centers point to continued growth of the more sophisticated general aviation users. Additionally, operations at non-towered U.S. airports have increased, supporting the belief held by many that much of general aviation is being forced out of many towered airports because of increased commercial air carrier or business jet activity.

General Aviation Operations Forecast

General information regarding expectations for Nut Tree Airport is included in the FAA *Terminal Area Forecast* (TAF) *Detail Report*. However, as stated previously, due to the lack of either historical tower recorded operations or operations recorded by an activity counter at the Airport, the TAF assumes zero-growth in aircraft operations. This zero-growth assumption is considered overly conservative considering that the Airport maintains a paid deposit, hangar wait list, and that as this latent hangar demand is satisfied, operations are expected to increase over the planning period.

In developing the general aviation activity forecasts, local, state, and national trends were reviewed. Included in this assessment, and, as presented in the following table, entitled *GENERAL AVIATION OPERATIONS FORECAST SCENARIOS, 2009-2030*, are the forecasts contained in the FAA *Terminal Area Forecast Detail Report* (December 2009), and four separate forecast scenarios developed for this study.

- **TAF:** FAA's *Terminal Area Forecast Detail Report*, December 2009.
- ***Scenario One:*** Projects an annual average growth rate of 1.69%, which is equal to the estimated annual population growth rate for Solano County through the year 2030.
- ***Scenario Two:*** Illustrates an average annual growth rate of approximately 0.50%, which is equal to the historical annual population growth rate for Solano County from 2005 through 2009.
- ***Scenario Three:*** Calculates an average annual growth rate of approximately 1.1%, which is the growth rate from the *FAA Aerospace Forecast, Fiscal Years 2010-2030* for general aviation hours flown by piston driven aircraft. This growth rate is also very

similar to the FAA TAF growth rate for the entire Western Pacific Region through 2030 of 0.99%. **This is the recommended operations forecast for this study.**

- ***Scenario Four:*** Calculates an average annual growth rate of approximately 2.50%, which is the growth rate form the *FAA Aerospace Forecast 2010-2030* for total GA hours flown by all aircraft types.

By selecting Scenario Three as the recommended forecast scenario, it is recognized that the conditions in Fairfield, Vacaville and Solano County in general will mirror aviation-related influences in the nation. It also recognizes an assumption that there are no identified significant local influences that are expected to either negatively or positively impact the current level of aviation activity at the Airport.

Table C5
GENERAL AVIATION OPERATIONS FORECAST SCENARIOS, 2009-2030[1]

Year	TAF	Scenario One 1.69%	Scenario Two 0.50%	Scenario Three 1.10%[2]	Scenario Four 2.50%
2009	101,500	101,500	101,500	101,500	101,500
2015	101,500	112,078	104,539	108,275	117,470
2020	101,500	121,742	107,140	114,279	132,710
2025	101,500	132,253	109,807	120,619	149,951
2030	101,500	143,681	112,543	127,316	169,460

Source: *BARNARD DUNKELBERG & COMPANY.*

[1] Includes military operations
[2] Recommended Forecast.

Operations Forecast by Aircraft Type

The knowledge of the types of aircraft expected to use Nut Tree Airport will assist in determining the amount and type of facilities needed to meet the aviation demand. The following table, entitled *SUMMARY OF OPERATIONS FORECAST BY AIRCRAFT TYPE, 2009-2030*, depicts the approximate level of use by aircraft types that are projected to use the Airport. As expected both regionally and nationally, the use of larger general aviation aircraft (turbo-prop and jet aircraft) is forecast to increase more rapidly than is the use of smaller general aviation aircraft (single engine piston) at the Airport.

It is assumed that the majority of existing and forecast jet aircraft operations at Nut Tree Airport are conducted by FAA approach category B aircraft (aircraft with approach speeds of 91 knots or more but less than 121 knots). FAA approach categories as a component of FAA's airport classification system known as the Airport Reference Code (ARC) is discussed in more detail in the following chapter.

In an effort to confirm this assumption, instrument flight plan data by aircraft type was acquired from the FAA's Aircraft Situational Display to Industry (ASDI) system. This system showed only an average of approximately 15 aircraft operations by aircraft with approach speeds of more than 121 knots over the last four years. An example of business jet operations in aircraft approach category B is the Dassault Aviation, Falcon 50B and Falcon 900, both of which are permanently based at Nut Tree Airport.

Table C6
SUMMARY OF OPERATIONS FORECAST BY AIRCRAFT TYPE, 2009-2030

Aircraft Type	2009[1]	2015	2020	2025	2030
Single Engine Piston	89,600 *(88.28%)*	92,985 *(85.87%)*	95,569 *(83.62%)*	98,157 *(81.37%)*	100,743 *(79.12%)*
Multi-Engine Piston	4,800 *(4.73%)*	5,122 *(4.73%)*	5,406 *(4.73%)*	5,706 *(4.73%)*	6,023 *(4.73%)*
Turbo-Prop	2,420 *(2.38%)*	3,660 *(3.38%)*	5,006 *(4.38%)*	6,490 *(5.38%)*	8,124 *(6.38%)*
Business Jet	3,420 *(3.37%)*	4,884 *(4.51%)*	6,297 *(5.51%)*	7,853 *(6.51%)*	9,562 *(7.51%)*
Helicopter	1,250 *(1.23%)*	1,624 *(1.50%)*	2,000 *(1.75%)*	2,413 *(2.00%)*	2,865 *(2.25%)*
Military	10 *(0.01%)*	11 *(0.01%)*	11 *(0.01%)*	12 *(0.01%)*	13 *(0.01%)*
Total Operations	**101,500** ***(100%)***	**108,286** ***(100%)***	**114,290** ***(100%)***	**120,631** ***(100%)***	**127,329** ***(100%)***

Source: [1]Estimates from Nut Tree Airport personnel.

Local and Itinerant Operations Forecast

As can be seen in the following table, entitled *SUMMARY OF LOCAL AND ITINERANT OPERATIONS FORECAST 2009-2030*, itinerant operations at Nut Tree Airport are expected to increase slightly over local operations, as more and more general aviation aircraft are increasingly utilized for business-related purposes. Also, as mentioned previously, the impact of the JAL bankruptcy on the training center in Napa is currently unknown. The continued success and/or closure of this training center will also have an impact on the breakdown of local versus itinerant operations as most of the JAL operations are touch-and-go operations which are classified as local operations.

Table C7
SUMMARY OF LOCAL AND ITINERANT OPERATIONS FORECAST, 2009-2030

Year	Local	Itinerant	Total
2009	40,000 *(39.0%)*	61,500 *(61.0%)*	101,500 *(100%)*
2015	41,149 *(38.0%)*	67,137 *(62.0%)*	108,286 *(100%)*
2020	42,287 *(37.0%)*	72,003 *(63.0%)*	114,290 *(100%)*
2025	43,427 *(36.0%)*	77,204 *(64.0%)*	120,631 *(100%)*
2030	44,565 *(35.0%)*	82,764 *(65.0%)*	127,329 *(100%)*

Source: *BARNARD DUNKELBERG & COMPANY.*

Based Aircraft Forecast

The number and type of aircraft anticipated to be based at an airport are vital components in developing a plan for that airport. Generally, there is a relationship between aviation activity and based aircraft, stated in terms of operations per based aircraft (OPBA). Sometimes, a trend can be established from historical information of operations and based aircraft. The national trend has been changing with more aircraft being used for business purposes and less for pleasure flying. This impacts the OPBA in that business aircraft are usually flown more often than pleasure aircraft.

Several based aircraft forecast scenarios are presented in the following table, entitled *BASED AIRCRAFT FORECAST SCENARIOS, 2009-2030*. These include the *Terminal Area Forecast Detail Report*, and three forecast scenarios developed for this study.

- **TAF:** FAA's *Terminal Area Forecast Detail Report*, December 2009. As the following table illustrates, the TAF does not project any increase in based aircraft for the Airport. It is also important to note that the current based aircraft count of 201 is approximately 11.6%

higher than the 180 based aircraft listed in the FAA TAF.

- ***Scenario One:*** Projects an average annual growth rate of 0.90%, which is equal to the nationwide active general aviation fleet forecast for based aircraft contained in the *FAA Aerospace Forecasts, Fiscal Years 2010-2030*.
- ***Scenario Two:*** The current estimate of 101,500 annual operations divided by the current count of 201 based aircraft at the Airport produces an OPBA of 505. This scenario assumes that the level of 505 OPBA is maintained throughout the planning period and projects based aircraft to increase in accordance with the selected operations forecast from Table C4.
- ***Scenario Three:*** This scenario assumes the existing hangar wait list is accommodated in 2010 and 2011 and then projects based aircraft to increase at the FAA Aerospace AAGR of 0.90%.

Table C8
BASED AIRCRAFT FORECAST SCENARIOS, 2009-2030

Year	TAF	Scenario One 0.90%	Scenario Two 505 OPBA	Scenario Three Satisfy Hangar Demand, then 0.90%[2]
2009	180	201[1]	201[1]	201[1]
2015	180	212	214	233
2020	180	222	226	244
2025	180	232	239	255
2025	180	243	252	267

Source: *BARNARD DUNKELBERG & COMPANY.*

[1] Actual.
[2] Selected Forecast.

Based Aircraft Forecast by Aircraft Type

The mix of based aircraft is shown on the following table, entitled *BASED AIRCRAFT FORECAST BY TYPE, 2009-2030*. It is expected that single engine aircraft will continue to be the dominant aircraft type based at Nut Tree Airport; although, increases in based single and multi-engine turbine, jet, and helicopters are anticipated.

Table C9
BASED AIRCRAFT FORECAST BY TYPE, 2009-2030

Aircraft Type	2009	2015	2020	2025	2030
Single Engine Piston & Turbo-prop	179 *(89.0%)*	205 *(88.0%)*	212 *(87.0%)*	219 *(86.0%)*	227 *(85.0%)*
Multi-Engine Piston & Turbo-prop	14 *(7.0%)*	16 *(7.0%)*	17 *(7.0%)*	18 *(7.0%)*	19 *(7.0%)*
Jet	5 *(2.5%)*	7 *(3.0%)*	9 *(3.5%)*	10 *(4.0%)*	12 *(4.5%)*
Helicopter	3 *(1.5%)*	5 *(2.0%)*	6 *(2.5%)*	8 *(3.0%)*	9 *(3.5%)*
TOTAL	**201** ***(100%)***	**233** ***(100%)***	**244** ***(100%)***	**255** ***(100%)***	**267** ***(100%)***

Source: *BARNARD DUNKELBERG & COMPANY.*

Summary

A summary of the aviation forecasts prepared for this study is presented in the following table, entitled *SUMMARY OF AVIATION ACTIVITY FORECASTS, 2009-2030*. This information will be used in the following chapters to analyze facility requirements, to aid development of alternatives, and to guide the preparation of the plan and program of future airport facilities. In other words, the aviation activity forecasts are the foundation from which future plans will be developed and implementation decisions will be made.

Table C10
SUMMARY OF AVIATION ACTIVITY FORECASTS, 2009-2030

Operations	2009	2015	2020	2025	2030
Single Engine Piston	89,600	92,985	95,569	98,157	100,743
Multi-Engine Piston	4,800	5,122	5,406	5,706	6,023
Turbo-Prop	2,420	3,660	5,006	6,490	8,124
Business Jet	3,420	4,884	6,297	7,853	9,562
Helicopter	1,250	1,624	2,000	2,413	2,865
GA Operations	101,490	108,275	114,279	120,619	127,316
Military Operations	10	11	11	12	13
TOTAL OPERATIONS	**101,500**	**108,286**	**114,290**	**120,631**	**127,329**
Local Operations	40,000	41,149	42,287	43,427	44,565
Itinerant Operations	61,500	67,137	72,003	77,204	82,764
Based Aircraft by Type					
Single Engine Piston & Turbo-prop	179	205	212	219	227
Multi-Engine Piston & Turbo-prop	14	16	17	18	19
Jet	5	7	9	10	12
Helicopter	3	5	6	8	9
TOTAL BASED AIRCRAFT	**201**	**233**	**244**	**255**	**267**

Source: *BARNARD DUNKELBERG & COMPANY.*

THE **Barnard Dunkelberg** **Company** TEAM