



Napa County Airport Master Plan

March 2007

Prepared for the
County of Napa



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Napa County Airport Master Plan

Napa, California

March 2007

Prepared
for the
County of Napa

by

**MEAD
&
HUNT**

Santa Rosa, California

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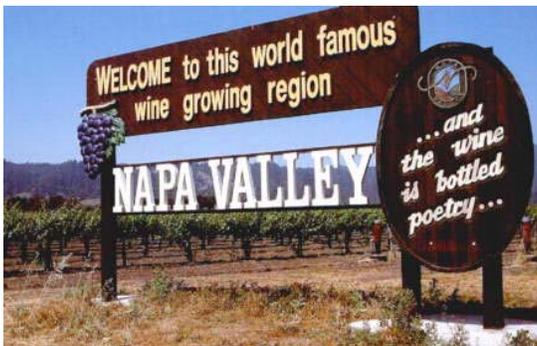
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Background and Inventory

AIRPORT ENVIRONS



The California Department of Finance combines Napa County and Solano County non-agricultural employment data. As of 2000, the local economy was based on Service 28%, Trade 24%, Government 19% and Manufacturing 12%.

Napa County is known worldwide as a premium wine-growing region and, as such, is characterized by a large scenic valley of expansive vineyards dotted with stately wineries (Table 1A). These distinctive attributes attract approximately five million visitors to the area per year. Indeed, tourism and associated support services are major contributors of the local economy.

According to the Association of Bay Area Governments (ABAG), over 28,000 new jobs will be created in Napa County by the year 2020. Compared to other counties in the Bay Area, Napa County will experience the highest percent increase in the service sector: 74 percent. By 2020, most jobs will occur in the cities of American Canyon and the Napa Airport Industrial Area. ABAG estimates that approximately 6,700 new jobs will be established in the Airport Industrial Area. Over the forecast period, the numbers of high technology and business service jobs are also expected to increase, thus changing the composition of the service industry.

Recreation is another contributor to the economy. With growing interest and popularity of golf, Napa and Yountville are frequent locales of the sport, attracting players with varying abilities: from novice to professional. These venues have hosted the Kaiser and Anheuser-Busch PGA golf tournaments, the Transamerica Senior PGA tournament and various PGA qualifying tournaments. NASCAR races at nearby Infineon Raceway also draw large crowds. Table 1A provides a summary profile of the community's characteristics and future trends.

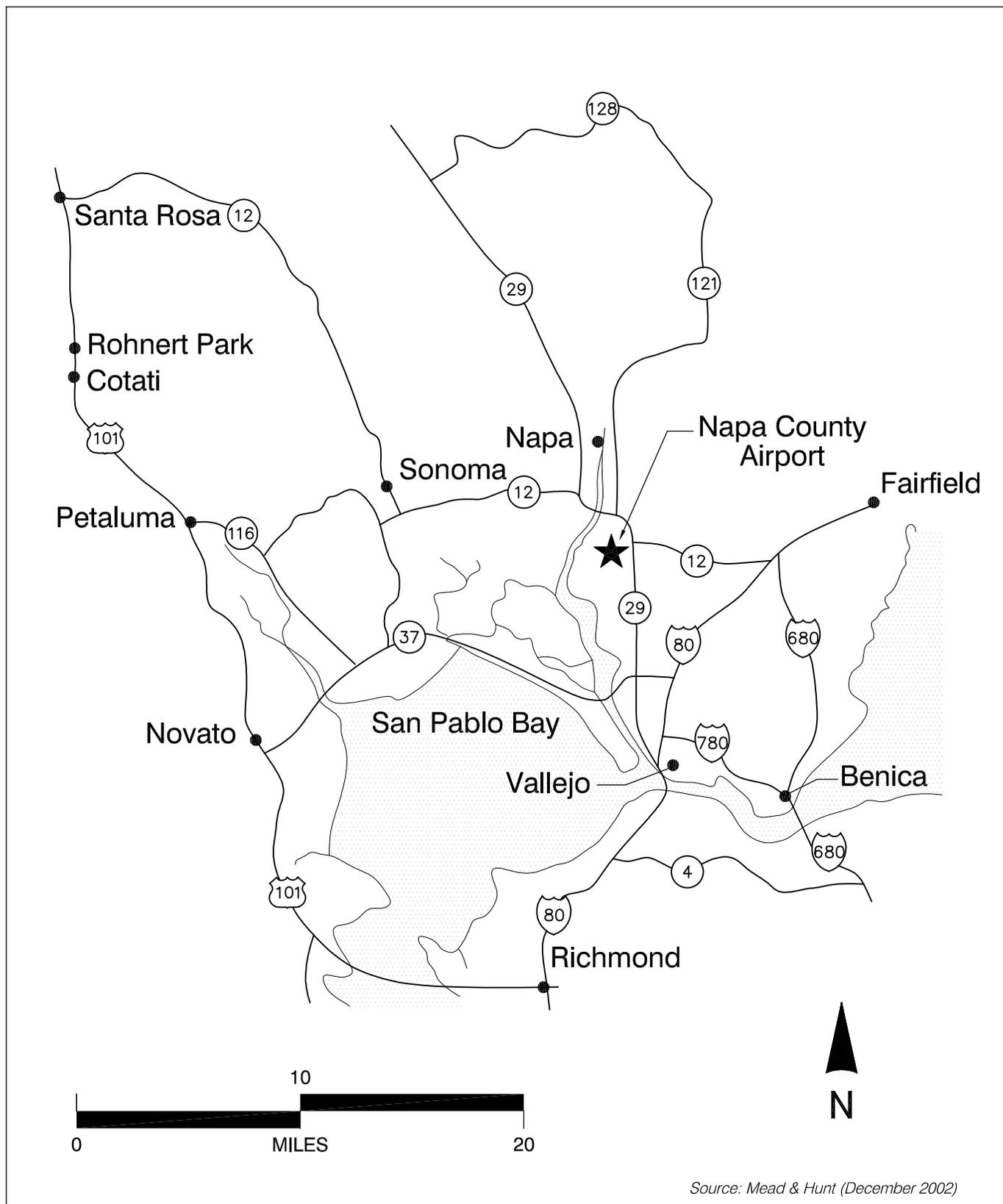


Figure 1A

Location Map
Napa County Airport

GEOGRAPHY

Location

Proximity to Airport

Cities/Major Cities

- ▶ 2 miles north of the City of American Canyon.
- ▶ 4 miles north of the City of Vallejo.
- ▶ 5 miles south of the City of Napa.
- ▶ 27 miles north of Oakland, across the Carquinez Straits.
- ▶ 42 miles northwest of San Francisco, across San Pablo and San Francisco Bays.

Counties

- ▶ Located at the southernmost end of Napa County.
- ▶ 3 miles north and west (on Highway 12) of Solano County.
- ▶ 5 miles west of Sonoma County.

Topography

- ▶ Napa County is characterized by a large fertile valley stretching along a north-south axis and bounded by mountains on the east and west.
- ▶ Elevations range from 5 feet along the Napa River to 1,400 feet along the eastern county line.

SURFACE TRANSPORTATION

Major Highways

- ▶ Primary access is State Route 29, extending northward up the Napa Valley, through the City of Napa and south through the City of Vallejo connecting to Interstate 80.
- ▶ State Highway 12, extends east/west and connects Highway 101 in Sonoma County to Interstate 80 in Solano County.

Railroads

- ▶ Southern Pacific Railroad tracks adjoin the Airport on the east.
- ▶ This line connects the Napa Valley with Southern Pacific's main lines to the south.
- ▶ The railroad branches in two directions just south of the Airport to serve Sonoma and Solano Counties.

Public Transportation

- ▶ Napa Valley Transit (NVT)
- ▶ Benicia Transit
- ▶ Vallejo Transit
- ▶ The VINE
- ▶ Van Go

Waterway Transportation

- ▶ Napa River connects to San Francisco Bay, providing recreational travel opportunities and serving industrial users transporting freight.

POPULATION AND ECONOMY

Current/Historical Population

County

	1990	1995	2000
▶ Napa County:	113,321	118,600	125,100
▶ Solano County:	347,598	374,000	396,900
▶ Sonoma County:	397,508	428,000	461,800

City

▶ City of American Canyon:	-----	9,025	9,850
▶ City of Napa:	63,313	67,900	72,900
▶ City of Vallejo:	112,191	115,600	117,700

(Source: California Department of Finance)

Projected Population

	2010	2015	2020
▶ Napa County:	143,900	150,500	158,400
▶ Solano County:	485,500	521,200	559,500
▶ Sonoma County:	557,300	591,900	628,400

(Source: Department of Finance - Interim County Population Projections, June 2001)

	2005	
▶ City of Vallejo:	126,800	not available

Basis of Economy

- ▶ Non-agricultural industry groups with greatest percentage of employment in Napa and Solano Counties:
 - ▶ Service 28%
 - ▶ Trade 24%
 - ▶ Government 19%
 - ▶ Manufacturing 12%

(Source: California Department of Finance)

CLIMATE

Temperatures

	Average High	Average Low
▶ Hottest month (July)	82.1°F	52..2°F
▶ Coldest month (Jan.)	57.7°F	37.4°F

Precipitation

- ▶ Average annual rainfall: 23.88 inches

Winds

- ▶ Prevailing winds are southwesterly

(Source: Napa Valley Economic Development Corp.)

Source: Data compiled by Mead & Hunt, Inc. (December 2001)

Table 1A

**Community Profile
Napa County Airport**



As part of the nine-county San Francisco Bay Region, Napa County is expected to grow 23 percent by the year 2020. Population and household growth is expected to be concentrated within the existing communities (predominantly the cities of Napa and American Canyon), thus preserving the agricultural lands that are vital to the area's economy. While job growth in the county is expected to increase by 50 percent, areas with the highest rates of job growth will be concentrated in the Napa Airport area (286 percent) and the City of American Canyon (196 percent).

A large portion of industrial zoned land in the County is near the Napa County Airport. This area is accessed by four transportation modes: air, water, rail, and highway. It is served by existing municipal sewer and water systems. The Napa River flows into San Pablo and San Francisco Bays and connects with the Sacramento River. The River is navigable for small watercraft to the Third Street Bridge in Downtown Napa and for barges to the Napa Pipe facility, located south of Napa.

The airport's environs are served by a variety of public transit services. Napa Valley Transit (NVT) primarily serves the cities of Napa, American Canyon, St. Helena, and Calistoga. NVT operates along the State Route 29 corridor between Vallejo and Calistoga. However, NVT also provides service to Yountville, Rutherford and Oakville. In Vallejo, NVT connects to most Vallejo ferries and to Vallejo BARTlink. In Napa, NVT links with Napa Valley Intracity Neighborhood Express (VINE). Benicia Transit and Vallejo Transit systems provide transportation to communities outside the NVT system. Van Go is an intercity bus service, providing dial-a-ride service to the County of Napa.

AERONAUTICAL SETTING

Area Airports

Also of importance in an airport master plan study are the interrelationships between the subject airport and nearby airports and airspace. Such interrelationships can be significant with regard to the marketing demand for aviation facilities and services, as well as in terms of air traffic control and other technical matters.

Ten airports are located within a 25-nautical mile radius of Napa County Airport. Of these, seven are public-use facilities: Buchanan Field, Gness Field, Nut Tree, Petaluma, Angwin-Parrett Field, Sonoma Skypark, and Sonoma Valley; two are private-use facilities: San Rafael, Travis Aero Club; and one is a military airfield: Travis Air Force Base. Public access to the private facilities requires prior permission of the operator. Travis Air Force Base currently supports U.S. Air Force operations and is not open to the public. Table 1B summarizes selected major features of each of these airports and Figure 1B shows their locations.



Source: San Francisco Sectional Aeronautical Chart (March 2007)

Figure 1B

Area Airports
Napa County Airport

Airport Name	Owner	Location					Facilities				Services				
		Community/County	Distance ¹ /Direction	Based Aircraft	Number of Runways	Longest Runway (ft.)	Surface ²	Lighted-Intensity ³	Approach Visibility ⁴	Control Tower	Airline Service	AvGas	Jet Fuel	Maintenance	Automobile Rentals
AREA AIRPORTS															
Napa County	County	Napa/Napa	–	247	3	5,931	Conc	M	¾	✓	–	✓	✓	✓	✓
Buchanan Field	County	Concord/Contra Costa	17S	579	4	5,010	Asph/Conc	H	¾	✓	–	✓	✓	✓	✓
Gross Field	County	Novato/Marin	15W	235	1	3,300	Asph	M	–	–	–	✓	✓	✓	–
Nut Tree	County	Vacaville/Solano	18 NE	247	1	3,800	Asph	M	–	–	–	✓	✓	✓	–
Petaluma Municipal	City	Petaluma/Sonoma	17 NW	193	1	3,600	Asph	M	1	–	–	✓	✓	✓	✓
Angwin-Parrett Field	Private	Angwin/Napa	22 NW	38	1	3,217	Asph	L	–	–	–	✓	–	–	–
San Rafael	Private	San Rafael/Marin	16 SW	100	1	2,140	Asph	L	–	–	–	✓	✓	✓	–
Sonoma Skypark	Private	Sonoma/Sonoma	8NW	60	1	2,480	Asph	–	–	–	–	✓	–	✓	–
Sonoma Valley	Private	Schellville-Sonoma/Sonoma	9 NW	331	2	2,700	Asph	–	–	–	–	✓	–	✓	–
Travis AFB	US Air Force	Fairfield/Solano	15E	–	2	11,000	Asph	H	–	✓	–	–	–	–	–
Travis AFB Aero Club	US Air Force	Fairfield/Solano	14 NE	21	2	2,000	Asph	L	–	–	–	✓	–	–	–

¹ Distance limited to 25 nautical miles from Napa County. Airports designated as “restricted”; non-public airports having *only* emergency or landmark value are not included in this table.

² Asph=asphalt; Conc=concrete

³ L=low; M=medium; H=high

⁴ Statute mile

Source: Data compiled by Mead & Hunt, Inc. from FAA Form 5010, Jeppesen, A.O.P.A. (May 2001)

Table 1B

Area Airports

Napa County Airport Vicinity

Of particular interest are those airports whose service areas overlap with Napa County Airport and which offer comparable facilities and competitive services. Airports offering services similar to those at Napa County (e.g., fuel, maintenance, automobile rentals) include Buchanan Field, Gness Field, Nut Tree and Petaluma. Because these airports offer competitive services, they can influence, to some extent, the future level of activity of the Napa County Airport.

Area Airspace

Class B Airspace generally surrounds the nation's busiest airports. The airspace begins from the surface to 10,000 feet MSL and is designed to contain all published instrument procedures once an aircraft enters the airspace. Air Traffic Control (ATC) clearance is required for all aircraft to operate in the area.

Controlled Airspace is any of several types of airspace in which some or all aircraft may be subject to air traffic control.

Napa County Airport is located on the periphery of the very complex San Francisco Bay Area Class B airspace environment. The airspace in the vicinity of the Airport, as well as the operations of air traffic using the Airport, are significantly influenced by the complex interaction of aircraft operating to and from the Bay Area's numerous air carrier, general aviation, and military airports. The various airspace elements and the Napa airspace environment, in general, are depicted in Figure 1B. The airspace classifications are illustrated in Figure 1C.

The Airport itself lies within, and at times under, "controlled" airspace. When the Airport's traffic control tower is in effect, controlled airspace in the vicinity of the Airport begins at the surface. When the traffic control tower is not in effect, the floor of controlled airspace begins at 700 feet above the surface of the Airport.

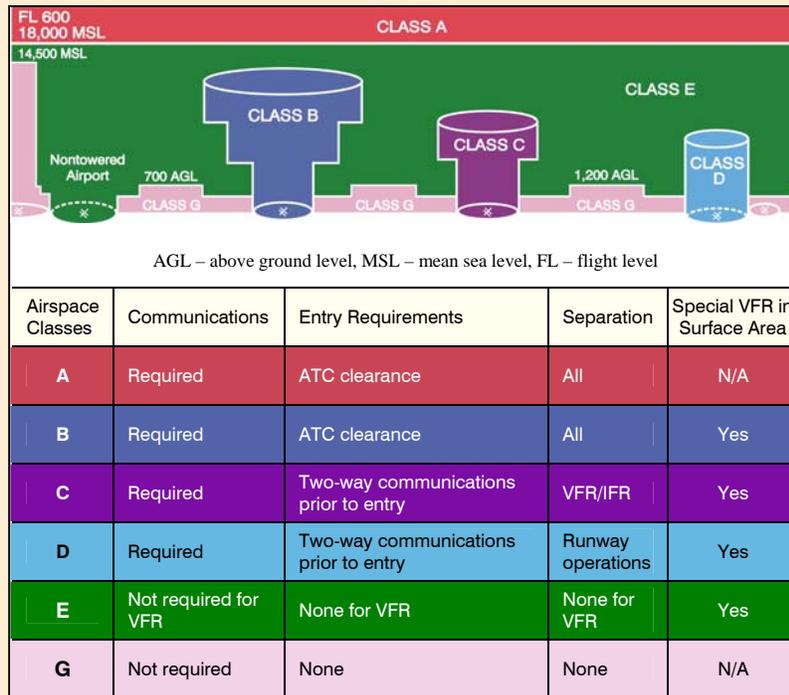
The Napa County Airport is served by a Federal Aviation Administration (FAA) Air Traffic Control Tower, which provides air traffic control on a 13-hour per day basis from 7:00 A.M. to 8:00 P.M. Weather information is provided 24-hours per day by an Automated Surface Observation System (ASOS). When the tower is in operation, Class D airspace is established which encompasses the airspace within a five-statute-mile radius of the Airport from the surface up to, but not including, 2,500 feet above ground level. Pilots must establish two-way radio communications with the ATC facility prior to entering this airspace.

A **Non-Precision** approach procedure provides horizontal guidance with altitude step-downs at prescribed points.

A **Precision** approach provides both vertical and horizontal guidance using an electronic glide slope for a constant descent procedure. A constant descent affords a stabilized approach that is generally preferred by pilots.

Instrument approach, departure, and en route air traffic control in the vicinity of the airport are provided by Oakland Air Route Traffic Control Center (Oakland Center). In addition, Oakland Center provides visual flight rule (VFR) traffic advisory services when workload permits. Air access to the airport during periods of instrument flight rule (IFR) conditions is currently provided by three FAA-authorized non-precision instrument approach procedures – a LOCALIZER approach to Runway 36L and VOR and GPS approaches to Runway 6.

**Figure 1-3
Airspace Classes**



Airspace Classes. Federal Aviation Regulations define six categories of airspace, which conform in both name and description with airspace designations used internationally. **Controlled Airspace** is any of several types of airspace in which some or all aircraft may be subject to air traffic control. With the number of aircraft flying over the United States today, proper airspace usage is critical for flight safety and efficient service to pilots and the flying public. To assist in this goal, the airspace is divided into six classifications.

CLASS A is the airspace from 18,000 feet to 60,000 feet. VFR is not allowed. All pilots flying in Class A airspace shall file an Instrument Flight Rules (IFR) flight plan and receive an appropriate air traffic control (ATC) clearance.

CLASS B is generally the airspace from the surface to 10,000 feet. This airspace is normally around the busiest airports in terms of aircraft traffic. Class B airspace is individually designed to meet the needs of the particular airport and consists of a surface area and two more layers. Pilots must contact air traffic control to receive an air traffic control clearance to enter Class B airspace.

CLASS C is the airspace from the surface to 4,000 feet above the airport elevation. Class C airspace will only be found at airports that have an operational control tower, are serviced by a radar approach control, and that have a certain number of IFR operations. Although Class C airspace is individually tailored to meet the needs of the airport, the airspace usually consists of a surface area with a 5 nautical mile (NM) radius, an outer circle with a 10 NM radius that extends from 1,200 feet to 4,000 feet above the airport elevation and an outer area. Pilots must establish and maintain two-way radio communications with the ATC facility providing air traffic control services prior to entering airspace. Pilots of visual flight rules (VFR) aircraft are separated from pilots of instrument flight rules (IFR) aircraft only.

CLASS D is generally that airspace from the surface to 2,500 feet above the airport elevation. Class D airspace only surrounds airports that have an operational control tower. Class D airspace is also tailored to meet the needs of the airport. Pilots are required to establish and maintain two-way radio communications with the ATC facility providing air traffic control services prior to entering the airspace.

CLASS E is generally that airspace that is not Class A, B, C, D, or G. Class E airspace extends upward from either the surface or a designated altitude to the overlying or adjacent controlled airspace. If an aircraft is flying on a Federal airway below 18,000 feet, it is in Class E airspace. Class E airspace is also the airspace used by aircraft transiting to and from the terminal or en route environment normally beginning at 14,500 feet to 18,000 feet. Class E airspace ensures IFR aircraft remain in controlled airspace when approaching aircraft without Class D airspace or when flying on "Victor airways" -- federal airways that are below 18,000 feet.

CLASS G is **uncontrolled** airspace. IFR aircraft will not operate in Class G airspace. VFR aircraft can operate in Class G airspace.

In addition, there are eight other forms of Special Use airspace (e.g., Prohibited Areas, Restricted Areas, etc.) that pilots must be aware of.

Napa County Airport is currently pursuing installation of a glide slope antenna to permit creation of a precision approach. Expected visibility minimums with glide slope installation are anticipated as low as 3/4 mile. Visibility minimums might be further enhanced with an upgrade to the approach light system (i.e., from ALSF to MALS configuration).

Victor Airways provide pilots with defined routes offering clearances from mountains and tall structures. They are used for both instrument and visual flight.

There are three low-altitude federal airways (Victor Airways) that pass near the Airport. Victor-195 and Victor-87 both run north-south; they are located east and west of the Airport, respectively. Victor-108 runs in a northwest-southeast direction and is located just south of the Airport, intersecting Victor-195. These airways radiate from Very High Frequency Visual Omnidirectional Range (VOR) stations, the closest being the VORTAC located 4.4 nautical miles southwest of the Airport on Skaggs Island.

Instrument Flight Rules (IFR) are rules governing the procedures for conducting instrument flight. The term "IFR" is also used by pilots and air traffic controllers to indicate a type of flight plan.

Generally, aircraft using the federal airways will be 3,000 feet or more above ground level and therefore will not have any effect on local airspace. However, the Scaggs Island VORTAC is also a primary navigational aid for IFR traffic approaching and departing the various Bay Area airports, including both of the instrument approach procedures established for Napa County Airport. The Scaggs Island VORTAC is utilized as the initial fix for the instrument approach to Runway 6 and as the primary en route feeder facility for the instrument approach to Runway 36L. Air traffic, both visual and instrument activity, in the vicinity of the Scaggs Island VORTAC is on occasion congested and must be integrated with other traffic in the North Bay Area. Other airports utilizing the Scaggs Island VORTAC therefore, affect airspace capacity for instrument approaches to Napa County Airport.

Visual Flight Rules (VFR) are rules that govern the procedures for conducting flight under visual conditions; without instrument assistance. The term "VFR" is also used by pilots and air traffic controllers to indicate a type of flight plan.

Of particular significance to Napa County Airport's airspace and operating environment is the Airport's proximity to the San Francisco Class B airspace, the San Francisco transponder/Mode C altitude encoder requirement area, and the Travis Air Force Base Alert Area (A-682). These areas are briefly described below and illustrated in Figure 1B. Napa County Airport is located just outside of these restricted areas and is thus affected by traffic transiting the area to avoid these more congested airspace zones. Flight training activities are also concentrated in the unrestricted airspace in the vicinity of the Airport.

- ▶ **San Francisco Class B Airspace**—The upper, outermost edge of this airspace lies 15 nautical miles south-southwest of the Napa County Airport between 6,000 feet and 10,000 feet above mean sea level.

- ▶ **Transponder/Mode C Requirement**—The FAA requires that all aircraft operating within 30 nautical miles of a terminal control area primary airport (e.g., San Francisco International Airport) be equipped with an operable transponder having Mode C altitude reporting capability. The nearest edge of the San Francisco transponder/Mode C altitude encoder requirement area lies 5.5 miles southwest of the Airport and extends from the surface upwards to 10,000 feet above mean sea level.
- ▶ **Travis Air Force Base Alert Area (A-682)**—The Travis Alert Area begins 4 nautical miles east of Napa and extends from the surface upwards to 6,000 feet above mean sea level. This area has been established to warn airspace users of the high-speed military operations occurring in the vicinity of Travis Air Force Base. This Alert Area is in effect weekdays from 8:00 A.M. to 9:00 P.M.

Aircraft transiting these designated airspace areas must be equipped with suitable electronic communication and navigational instrumentation. In the specific case of San Francisco's Class B airspace, an air traffic control clearance must also be obtained prior to entry.

AIRPORT FACILITIES

Location and Environs

Napa County Airport is situated at the southern entrance to Napa Valley near the intersection of State Route 29 and State Route 12. The airport is approximately 5 miles south of the Napa City Limits and within 3 miles north of Vallejo and American Canyon.

The Airport is bounded on the west by marshland of the Napa River delta, and on the east by the Southern Pacific Railroad. Other properties adjoining the Airport include the salt evaporation ponds to the southwest and the sanitation district's sewer ponds to the northwest.

Existing urban development in the area primarily includes industrial and heavy commercial land uses located along State Route 29, Airport Boulevard, Tower Road, and Green Island Road. The Napa Valley Gateway Business Park is located northeast of the Airport, extending north of Airport Boulevard. The 386-acre development accommodates research and development, office, light assembly and warehouse/distribution facilities.



The nearest residential development is the Cuttings Wharf area which is located west of the airfield, on the west bank of the Napa River. Other residential land uses are concentrated in the American Canyon Area and are located approximately two miles south of the Airport.



Napa River

The topography of the area is relatively flat, gently rising in elevation from the banks of the Napa River. The nearest high terrain that presents a natural constraint to airport operations is situated east and northeast of the Airport. There is also a small hill (elevation 63 feet) located on airport property directly under the approach path to Runway 36L.

Airport Development

Napa County Airport was originally constructed in 1942 by the Army Corps of Engineers on land owned by the County. The purpose of the construction, to establish an air base for national defense, was never fulfilled and the airport facilities were conveyed to the County for civilian use in 1945. At that time, the Board of Supervisors appointed an Airport Advisory Commission to foster development of airport plans and operations. Numerous federally funded development projects have enhanced the Airport's safety and capacity. Appendix A contains a complete chronology of the Airport's development.

Airport Management

Napa County Airport is operated under the jurisdiction of the Napa County Board of Supervisors. The airport is operated under the direction of the Airport Manager, who reports to the County Department of Public Works. Public Works oversees all development projects on the Airport. An Airport Advisory Commission, appointed by the Board, meets monthly to provide guidance on important issues. There are presently six employees who provide administrative, maintenance on the airfield and airport grounds, as well as other operations-related functions such as; assist in crash/fire/rescue services and airport security. The Airport's administrative offices are open weekdays from 8:00 a.m. to 5:00 p.m.

Overall Layout

The airfield has a triangular configuration with the primary taxiway forming the base of the triangle and the intersection of the two main runways (6-24 and 18R-36L) forming the apex. The Airport's building area is divided into two general areas: 1) the existing,

developed area on the east side of the airfield adjoining the primary taxiway, and 2) the south side of the airfield adjoining Runway 6-24. Most of the area west of the airfield is a natural wetland, unavailable for aviation use.

The majority of aviation facilities and services are concentrated on the east side of the airfield along Airport Boulevard. Development on the south side of the Airport, south of Runway 6-24, includes the California Highway Patrol (CHP) flight operation facility and its patrol facility, two box hangars and the control tower. Table 1C provides a summary profile of the Airport's facilities and services.

Aircraft Parking Aprons

There are primarily two public aircraft parking aprons within the core building area and a private ramp leased to the based airline pilot training facility. The airline pilot training facility is located at the entrance to the Airport at the north end of the primary taxiway. Visiting aircraft utilize the transient aircraft parking ramp located near the terminal building. The ramp area is visible from the parking lot at the entrance to the airport.



Tiedowns. The north apron area encompasses 21.3 acres and has the capacity for 63 aircraft tiedowns. Thirty-three of these tiedowns provide parking for transient aircraft. The south apron area affords 95 tiedown spaces on 11.7 acres.

AIRPORT SERVICES AND TENANTS

Fixed Base Operators (FBO)

There are four commercial leaseholds on the Airport that offer aviation services: a full-service fixed base operator, a contract flight training school, an avionics firm and a helicopter FBO. In addition, the California Highway Patrol leases property on the south side of the airport (Table 1 D).

- ▶ Bridgeford Flying Service, originally established at the Airport in 1946, is a Cessna dealer and offers a full range of services to the California/Nevada region including: fuel, engine and airframe service and repair, itinerant hangar and tie downs, aircraft rentals and charter, auto rentals, as well as flight instruction. Bridgeford also offers crew leasing, management and catering services. Their lease includes a large maintenance hangar fronting on the main ramp, counter and offices and a pilot supply shop located in the terminal building.

A **Fixed Base Operator (FBO)** is a business operating at an airport that provides aircraft services to the general public, including but not limited to, sale of fuel and oils, aircraft sales, rental, maintenance and repair; parking and tiedown or storage of aircraft; flight training, air taxi/charter operations, and specialty services, such as instrument and avionics maintenance, painting, overhaul, aerial application, aerial photography or pipeline patrol.

MAJOR FEATURES**Property**

- ▶ 794.4 acres owned in fee and operated by the County of Napa.

Airfield

- ▶ Runway 18R-36L: 5,931 feet long, 150 feet wide; concrete.
- ▶ Runway 18L-36R: 2,500 feet long, 75 feet wide; asphalt.
- ▶ Runway 6-24: 5,007 feet long, 150 feet wide; concrete.

Runway Approach Lighting

- ▶ Runway 18R: PAPI (Precision Approach Path Indicator)
- ▶ Runway 36L: MALS (Medium Intensity Approach Lighting System)

Runway Landing Aids

- ▶ Runway End Lights: REILS (Runway End Identifier Lights) - Runway 6
- ▶ Runway Edge Lights: MIRL (Medium Intensity Runway Lights)-Runway 18R-36L and Runway 6-24

Building Area

Two areas: east and south sides of the airfield.

- ▶ Area east of Taxiway A:
 - ▶ Airport Administrative office, pilot shop and restaurant
 - ▶ FBOs and flight training facilities
 - ▶ Transient and based aircraft tiedown spaces
 - ▶ Hangars of various shapes and sizes
- ▶ Area south of Runway 6-24:
 - ▶ California Highway Patrol (CHP) facility
 - ▶ FAA Air Traffic Control facility
 - ▶ Box hangars

AIR TRAFFIC PROCEDURES**FAA Control Tower**

- ▶ Hours of operation: 7:00 A.M. to 8:00 P.M.
- ▶ Automatic Terminal Information Service (ATIS): 124.05 MHz
- ▶ Local Control: (CTAF) 118.7 MHz
- ▶ Ground Control: 121.7 MHz

Traffic Pattern

- ▶ Pattern altitude- 1,033 feet MSL

Instrument Approaches

- ▶ LOC -Runway 36L
- ▶ VOR or GPS -Runway 6

Navigational Aids

- ▶ Scaggs Island VORTAC

Communications

- ▶ Air Route Traffic Control Center
"Oakland Center" – 127.8 MHz
- ▶ UNICOM- 122.95 MHz

MANAGEMENT AND SERVICES**Management**

- ▶ On-site management by the Airport Manager, reports to the Department of Public Works
- ▶ Day-to-day maintenance by airport staff.

Fixed Base Operations Services

- ▶ FBOs offer various aircraft and general aviation services (refer to Table1B).
- ▶ Fuel: 100LL and Jet A. Fuel service hours 7:00am to 9:00pm. Fuel is dispensed via fuel truck seven days a week. After hours call for service.

Emergency and Security

- ▶ California Highway Patrol Air Support Unit provides search and rescue, medical services and law enforcement.
- ▶ Greenwood Ranch Fire Station provides fire service to the airport and nearby communities (located off-site).
- ▶ During special events, additional on-airport security is provided by event sponsors.

ENVIRONS**Topography**

- ▶ Airport Elevation: 33 feet MSL
- ▶ Elevations in the Vicinity:
 - ▶ 63' hill; on approach to Runway 36L
 - ▶ 260' hill on the east within 1 mile of Runway 18-36 traffic pattern entry points
 - ▶ 500' hills to east rising to 1100 feet
 - ▶ 800' hills to northeast rising to 1900 feet

Access

- ▶ 1 mile east on Airport Road to intersection of Highway 29 and Highway 12

Jurisdiction

- ▶ County of Napa

Principal Land Uses

- ▶ Agriculture and industrial northwest
- ▶ Agricultural and industrial to the south
- ▶ Primarily industrial development to the east
- ▶ Marsh land and salt evaporation ponds to the west

Source: Data compiled by Mead & Hunt, Inc. (January 2002)

Table 1C

Airport Profile

Napa County Airport

A significant percentage of modern general aviation aircraft are equipped with sophisticated radios and electronic devices that permit two-way communication and point-to-point navigation. These aviation-related electronic components (e.g. radio transmitters, receivers, navigational receivers, and weather radar) are referred to as avionics.



- ▶ Located at the north end of the Airport, the Japan Air Lines training facility covers 16.8 acres. International Air Services Corporation (IASCO) provides the training program at this facility. This program currently serves about 125 students. However, in the past, over 100 flight students have been accommodated. Beechcraft's single-engine Bonanza A-36 and twin-engine King Air C-90 aircraft are used for training. The program's primary emphasis is on basic training and advancing the students from pre-solo through twin-engine and instrument ratings. IASCO offers crew leasing and management services. Fueling services are also offered. Facilities include a two-story office and classroom building and two maintenance hangars.
- ▶ Silverado Avionics is a dealer and service facility for aviation-related electronic components. The firm specializes in fixed-wing and helicopter avionics for government agencies. Silverado Avionics service area reaches outside of the air trade area for Napa County Airport. Its leasehold, which encompasses 37,762 square feet, is located south of the main ramp. Silverado Avionics' facility includes a large (11,640 square feet) hangar constructed in 1971 and five tiedown spaces that are leased to Bridgeford Flying Service.
- ▶ California Highway Patrol Air Operations Unit is based at Napa County Airport. This unit provides law enforcement, search and rescue and emergency medical services support to public safety agencies in the San Francisco Bay Area. The Unit's service area covers 7,000 square miles.

In addition to the fixed base and specialty operators located at the Airport, Jonesy's Steak House restaurant is situated in the terminal building. Table 1D provides a description of FBOs in addition to other aviation and non-aviation airport tenants.

PREVIOUS PLANS AND STUDIES

This Master Plan Report is the third comprehensive study of Napa County Airport; the last study was completed in 1991. There have also been several studies related to development at the Airport and surrounding areas, which form the policy framework for the current study. These studies are briefly described below.

FIXED BASE OPERATIONS (AVIATION-RELATED SERVICES)																			
Name	Fuel Sales			Flight Instruction		Aircraft Rental		Aircraft Parts & Maintenance			Aircraft Storage			Miscellaneous					
	100/100LL	Jet-A	80	Fixed Wing	Helicopter	Fixed Wing	Helicopter	Engine	Airframe	Avionics	Helicopter	Other	Based Tie-downs	Hangars	Transient Ramp	Pilots' Supplies	Charter (FAR 135)	Aircraft Sales	Other
Bridgeford Flying Service	✓	✓		✓		✓		✓	✓	✓			✓	✓	✓	✓	✓	✓	✓ ¹
International Air Service Company (IASCO) ⁴	✓ ²	✓ ²		✓ ²															
Silverado Avionics																			✓ ³
Wine Country Helicopters					✓														✓
OTHER AVIATION-RELATED TENANTS																			
Name	Type of Business																		
California Highway Patrol (CHP)	Air operations unit law enforcement, search-and-rescue, and emergency medical services																		
NON-AVIATION TENANTS																			
Jonesy's Steak House	Restaurant																		

¹ Crew leasing, management, and car rental services
² Independent fuel operation and flight instruction
³ Aircraft and helicopter
⁴ Operates under contract on leasehold owned by Japanese Air Lines

Source: Data compiled by Mead & Hunt, Inc. (November 2001)

Table 1D

Airport Tenants
Napa County Airport

- ▶ **Proposed Airport Expansion EIR, 1974**—This report evaluated the environmental impacts associated with the runway extension project and the expansion of IASCO's training facility to accommodate jet operations. The report concluded that the proposed extension could not accommodate large air carrier aircraft, but would be adequate for small jets.
- ▶ **Airport Master Plan, 1976**—This plan served as a basis for airport improvements completed over the last 12 years which include: the extension of Runway 18R and connecting taxiway; and the construction of a parallel runway, additional taxiways and large parking apron. Several issues were also addressed including the expansion of jet training operations and future air carrier activities. These issues are no longer a significant concern, as the type and level of operations forecast in the plan are not likely to be realized.
- ▶ **Airport Area Master Environmental Assessment, 1984**—This study organizes and presents environmental information pertinent to future land use planning and development proposals. It encompasses approximately 4,130 acres of land surrounding the Airport. The Master Environmental Assessment is used as a basis for the development of specific plans and development guidelines and in evaluating the potential impacts of specific projects.
- ▶ **Airport Area Specific Plan and EIR, 1986**—This document includes specific land use policies to guide and facilitate development in the 2,945-acre industrial area surrounding Napa County Airport. The plan sets forth detailed land use and circulation standards, capital improvement requirements, associated financing and improvement sequencing measures, as well as regulatory procedures to implement the plan.
- ▶ **Airport Master Plan, 1991**—This plan served as the foundation for airport improvements over a 20-year span. The primary focus was to improve the operational safety of the airport and to minimize potential environmental impacts. Recommendations of the plan included an extension of parallel runway 18L-36R by 880 feet (from 2,500 feet to 3,380 feet) to accommodate flight training activities and reduce the frequency of overflights over residential areas west of the airport; installation of a glide slope antenna to Runway 36L to provide a precision instrument approach or Instrument Landing System (ILS); and acquisition of additional land to protect the future precision approach to Runway 36L and a future nonprecision approach to Runway 24. Other recommendations included usage of the main ramp for

fixed base operator and transient activities; relocating based aircraft to the south ramp; and construction of hangars on the south side of the airport.

Other documents not concerned specifically with the Airport are nonetheless important with regard to aviation forecasting and compatible land use planning. These include the comprehensive plans, zoning ordinances and other planning information for the surrounding communities. Therefore, these documents, as well as others will be considered as part of this Master Plan study.

Airport Role and Activity Forecasts

AIRPORT ROLE

Present



Napa County Airport is one of two public use airports in Napa County. As a general aviation facility, the airport provides a base of operations for local pilots, a point of air access to Napa and the communities surrounding the airport, a place to conduct business, a center for flight training and related activities, and a point of emergency access for the community. These airport functions are discussed below:

- ▶ **A Base for Napa Area Pilots**—Napa County Airport is the most convenient general aviation airport for the majority of pilots who live or work in Napa and nearby communities.
- ▶ **A Point of Air Access for Visitors to the Community**—The airport is an entrance to Napa and communities surrounding the airport for both recreation and business. The location of the airport draws visitors to Napa County's world-renowned wineries, restaurants, various Professional Golf Association (PGA) tournaments, and periodic NASCAR events at nearby Sears Point Infirion Raceway. Other attractions include Marine World Africa USA and the COPIA cultural museum and education center.

Personal/recreational flying: the use of aircraft by individuals (in their own, rented, or borrowed aircraft) for pleasure, recreational, or personal transportation not in furtherance of their occupation or company business.

Business flying: the use of aircraft by pilots (not receiving direct salary or compensation for piloting) in connection with their occupation, their employer's business, or in the furtherance of private business.

Corporate flying: the use of aircraft, owned or leased, and operated by a corporation or business firm, for the transportation of personnel or cargo in furtherance of the corporation's or firm's business, and which are flown by professional pilots receiving a direct salary or compensation for piloting.

The horrific events of September 11, 2001 seriously impacted the nation's air transportation system. For the first time in U.S. history the entire civil aviation fleet, other than some law enforcement aircraft, was grounded for a period of several days. Over the months, and perhaps years ahead we will see changes in the country's airport and air transportation systems that could not even have been imagined in the past. What these changes will entail can only be speculated on at this time, but it can be assumed that more restrictions, not fewer, will be imposed on all sectors of the aviation industry.

- ▶ **A Place to Conduct Business**—There are six aviation and non-aviation businesses on airport property, including three fixed base operators (FBOs), a state agency (California Highway Patrol), a federal agency (Federal Aviation Administration air traffic control tower), pilot shop and restaurant. These businesses contribute to the local economy through their payrolls and purchases of goods and services.
- ▶ **A Center for Flight Training and Related Activities**—Napa County Airport supports significant amounts of flight training activity. Two fixed base operators offer flight instruction. The Japan Airline (JAL) facility is a training center for commercial pilots operated by IASCO. As a Cessna Pilot Center, Bridgeford Flying Services offers flight instruction to private pilots in both single-engine and multi-engine fixed-wing aircraft.
- ▶ **A Site for Emergency Community Access**—Airports also serve as marshalling points for the distribution of emergency aid and supplies from one community to another. The California Highway Patrol (CHP) is based at Napa County Airport. One of the primary functions of CHP is to provide search and rescue, and emergency medical services to nine Bay Area Counties. For this reason, Napa County Airport is well positioned in this regard, making this operational role an important one.

Future

Flight training and recreational use will continue to account for a significant proportion of total aircraft operations at the airport. At the same time operations by business and corporate (including charter) aircraft are expected to increase. It is also anticipated that Napa County Airport will become the home base for more high performance corporate and business aircraft over the planning period.

No scheduled air carrier (passenger) or commuter airline service is anticipated at this time. The potential exists that an airline may propose serving Napa County Airport in the immediate future. However, given the current structure of the airline industry, it appears unlikely that this will occur within the lifespan of this plan (nominally 20 years). Therefore, no provision for airline service has been made in this plan.

HISTORICAL AIRPORT ACTIVITY

Based Aircraft

Fixed Base Operator (FBO) - A business operating at an airport that provides aircraft services to the general public, including fuel and oil, aircraft sales, rental, maintenance and repairs; parking and tiedown or storage of aircraft; flight training, air taxi/charter operations; and specialty services (e.g., instrument and avionics maintenance and aerial photography).

There are 224-based aircraft at Napa County Airport. These aircraft are stored in hangars provided by FBOs, on private leaseholds, in hangars (including shade hangars) developed by Napa County, or parked at FBOs, or on County-owned tiedown aprons. Data on based aircraft is available from 1966. As can be seen in Figure 2A, the general trend has been one of slow continuing growth. There have been periods when there has been decline. The most recent decline started in the mid 1990s. Lack of data prohibits documenting the path of the decline. For the last two years, the number of based aircraft has rebounded, showing a slight increase.

Transient Aircraft Parking

Information on the demand for transient aircraft parking is limited to data from tiedown fees, and observations from FBO and County employees. Transient aircraft utilize both parking apron areas provided by the major FBO and the County. The demand for transient parking varies significantly on a day-to-day basis. On peak days, up to 27 aircraft may be on the major FBO and County apron areas. During normal operations, transient parking is adequate. However, transient parking demand is significantly increased during major events such as NASCAR races at Sears Point and PGA tournaments. Historical data on changes in transient demand are not available. However, anecdotal data from County and FBO staff indicate that peak volumes have increased in recent years.

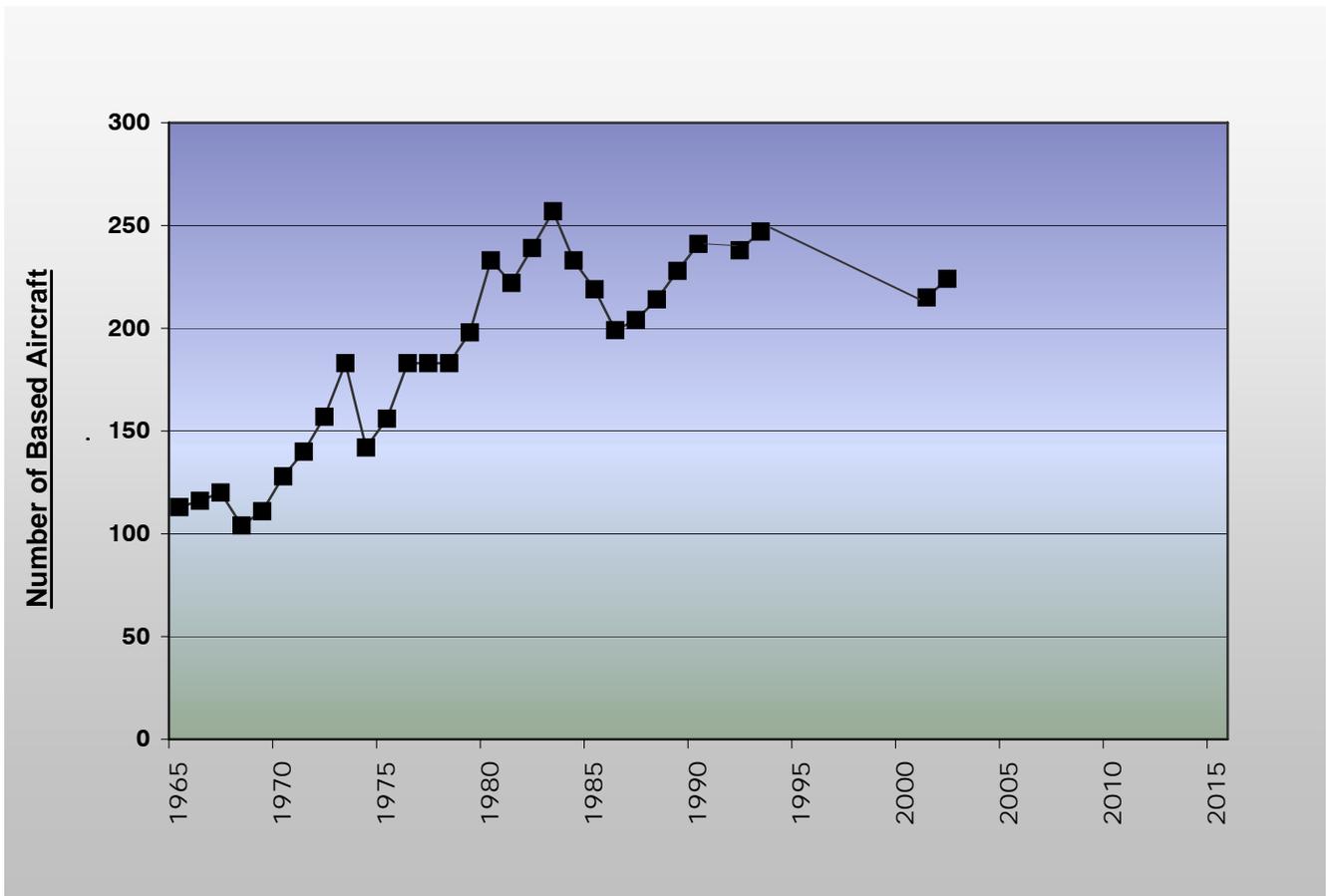
Except during major NASCAR races at Sears Point, use by private helicopters is infrequent. During such events, Taxiway A from the intersection of Taxiway E to the south apron area is closed and utilized for helicopter parking.

Operations

The Napa County Airport FAA Air Traffic Control Tower (ATCT) documents the number and type of aircraft operations conducted during the hours that the tower is open. The tower is operational from 7:00 a.m. to 8:00 p.m.

For purposes of reporting airport activity, an "operation" is considered to be a takeoff or a landing. A "touch-and-go" is counted as two operations, i.e., a takeoff and a landing.

In this plan, aircraft counts made by air traffic control staff are used to document operations. As the tower is staffed only 13 hours each day, actual operations are slightly higher.



Source: Data compiled by Mead & Hunt, Inc. (December 2002)

Figure 2A

Based Aircraft - Historical
Napa County Airport

The historical distribution of operational activity (i.e., day/night, VFR/IFR, local/itinerant) can be derived in part from airport records, and in part from discussions with those familiar with the airport (e.g., tower staff, airport users, etc.). Information from these sources indicates that the vast majority of operations at Napa County Airport are conducted during daylight hours. Such distribution of activity is consistent with day/night activity indices for comparable general aviation airports. This issue is further discussed in Chapter 5.

Figure 2B illustrates aircraft operations for the period 1966-2001. The general pattern has been one of peaks and valleys of varying duration. Distinct peaks in activity occurred in 1973, 1979, and 1994. The highest historical peak occurred in 1979 with about 250,000 operations. The most recent peak, in 1994, totaled about 230,000 annual operations. From 1994 through 1997 there was a succession of declines in operation. Since 1997, annual operations have leveled off, although there has been significant year-to-year variation.

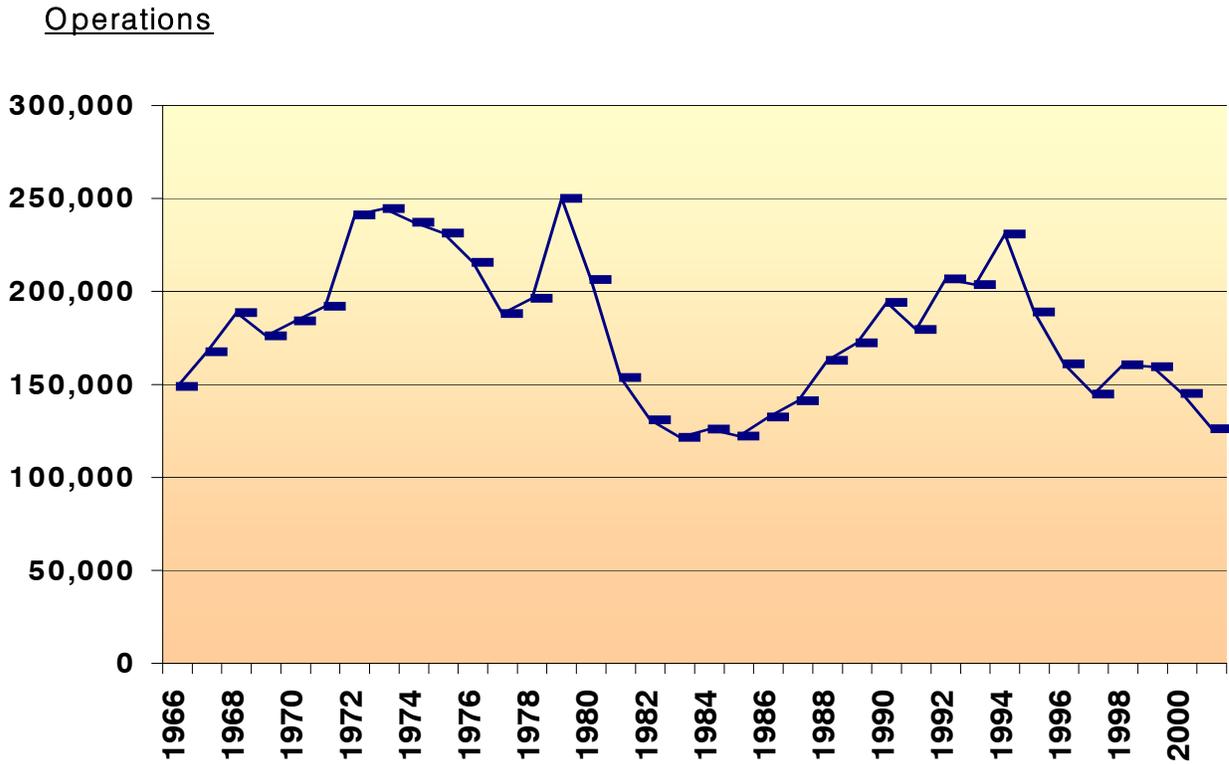
The sharp decline of operations after 1994 is largely due to a reduction of flight training by JAL, a helicopter training FBO based at Buchanan field, and flight schools based at other airports.

In calendar year 2001, there were a total of 126,080 aircraft operations recorded at Napa County Airport. Of these operations, 48 percent were itinerant operations (i.e., flights that originated or terminated at an airport other than Napa County Airport) and 52 percent were local operations (i.e., flights that began and ended at Napa County Airport, including touch-and-go and other similar training operations).

AVIATION ACTIVITY FORECASTS

In accordance with FAA guidelines, the time horizon of the forecasts in this *Airport Master Plan* is 20 years. There will always be uncertainties in forecasting future events. In the past, these uncertainties made the forecasting of general aviation airport activity an inexact science at best. Today general aviation faces even more uncertainties than ever before.

The Master Plan forecasts of future aviation activities at Napa County Airport are summarized in Table 2A. Projections have been developed for based aircraft and annual aircraft operations.



Source: Data compiled by Mead & Hunt, Inc. (December 2002)

Figure 2B
Aircraft Operations — Years 1966 - 2001
 Napa County Airport

	Current	Projected 2021	
	2001	Low	High
BASED AIRCRAFT			
<i>Aircraft Types</i>			
Single-Engine	183	230	260
Twin-Engine	19	20	24
Turboprop	13	22	30
Jets	7	12	20
Helicopters	2	6	6
Total Aircraft	224	290	340
<i>Storage Demand</i>			
Apron	87		
Hangar Space (includes shade hangars)	137	270	320
Total Aircraft	224	290	340
TRANSIENT AIRCRAFT			
Peak Parking Demand	27	44	44
ANNUAL AIRCRAFT OPERATIONS			
<i>Aircraft Mix</i>			
Single-Engine Piston	86,040	137,500	175,000
Twin-Engine Piston	15,640	21,000	33,500
Twin-Engine Turboprop	13,140	27,000	27,000
Small Jet (e.g., Citation)	5,630	12,500	12,500
Medium Jet (e.g., Falcon 900)	1,250	4,500	4,500
Large Jet (e.g., Gulfstream)	1,880	3,500	3,500
Helicopters	2,500	4,000	4,000
Total	126,080	210,000	260,000
<i>Type of Operation</i>			
Local (Touch-and-Go's)	65,080	110,000	160,000
Itinerant	61,000	100,000	100,000
Total	126,080	210,000	260,000
<i>Average Operations per Based Aircraft</i>			
Total	563	724	765

Source: Data compiled by Mead & Hunt, Inc. (May 2002)

Table 2A

Master Plan Activity Forecasts
Napa County Airport

As outlined in the following sections, these forecasts have been developed by:

- ▶ Considering the previously described historical activity levels at Napa airport;
- ▶ Assessing national, state, and local trends and other factors which influence the airport's activity; and then
- ▶ Drawing conclusions from this data.

BASED AIRCRAFT

National Demand Factors

The Federal Aviation Administration (FAA) uses numerous demand factors in forecasting aviation trends. These demand factors are part of what determines the growth rates of general aviation at a national level. The following national demand factors for general aviation operations were taken from *FAA Aviation Forecasts, 2000 to 2011*:

GENERAL AVIATION (GA)

- ▶ General Aviation is all flying except military and scheduled airline flights.
- ▶ There are 221,000 general aviation aircraft in the U.S., approximately 92% of the total civilian fleet.
- ▶ Some 78% of all GA aircraft have fewer than six seats and weigh less than a compact car.
- ▶ General Aviation generates about \$65 billion in U.S. economic activity each year.
- ▶ More than 65% of all GA flights are conducted for business, commercial, and public service purposes.
- ▶ Under normal circumstances, there are approximately 132,000 GA flights per day.
- ▶ GA connects the majority of communities with the nation's air transportation system.
- ▶ GA serves more than 5,300 public-use airports in communities both large and small, while scheduled airlines serve only 660 U.S. airports and 75% of major airline flights operate out of only 66 big-city airports (half of these flights only serve 29 hub airports).

- ▶ Total active general aviation aircraft fleet
- ▶ Passage of product liability reform legislation in 1994
- ▶ Issuance of student pilot certificates
- ▶ Resurgence of piston-engine aircraft manufacturing
- ▶ Manufacture of new turbine-powered business aircraft

All factors listed above have shown some growth since 1994. The active general aviation fleet is forecast to experience an annual increase of 0.9 percent or 24,000 aircraft over the forecast period. This means by the year 2011 the general aviation fleet will total nearly 231,000 aircraft.

The majority of the general aviation fleet will be piston-powered aircraft, representing 76.7 percent of the overall fleet. Yet, the turbine-powered fleet is expected to change the composition of the active fleet by the year 2011, increasing at four times the rate of the piston-powered fleet. Over 60 percent of these aircraft will be turbojet aircraft and 39 percent will be turboprop aircraft; 11,295 turbojets and 7,240 turboprops added to the general aviation fleet over the forecast period.

The increase in jet activity is attributed to a shift from commercial air travel to corporate/business air travel. The success of fractional

ownership of jet aircraft is a major contributor to the growth in jet use.

General aviation hours flown is forecast to increase by 2.2 percent annually, from 28.1 million in 1999 to 38.8 million in 2011. Growth in the number of active pilots is also anticipated to increase annually by 2.1 percent. The greatest increase expected to occur over the forecast period is in the student pilot population, 3.4 percent annually. Growth in this category suggests growth in both pilot training and flight training schools, which points toward industry-wide growth in instructional as well as personal/recreational flying.

A **Reliever Airport** is an airport serving general aviation aircraft that might otherwise have to use a congested air carrier airport (e.g., San Francisco and Oakland International airports).

The Federal Aviation Administration (FAA) classifies Napa County Airport as a reliever airport. There are 334 designated reliever airports in the United States and each of these airports is included in the *Federal Aviation Administration's National Plan of Integrated Airport Systems (NPIAS)*. General aviation airports account for 74 percent of NPIAS airports, reliever airports represent 10 percent of the national airport system.

The FAA's *Terminal Area Forecast* for the Napa County Airport anticipates growth in based aircraft. The FAA forecasts that the Airport will have 316 based aircraft by 2015.

State and Local Demand Factors

The most recent California State Airport System Plan (CASP) was published in 1999. The system plan included all public-use airports in California. The CASP projected registered single-engine and multi-engine aircraft from 1995 to 2020. CASP estimated that both single-engine and multi-engine aircraft at Napa County Airport would grow at the same rate; by 35 percent or 1.2 percent annually over the forecast period.

The following airport-specific demand influences partially overlap the above national and state demand factors, but are more reflective of the conditions existing at Napa County Airport:

- ▶ **Airport Role** — The current role of Napa County Airport includes significant use by personal general aviation aircraft and flight training activities. As noted above, the national growth potential of one of Napa County Airport's primary user is projected to represent a limited, but still significant component of aviation activity. While the majority of aircraft using Napa County Airport is expected to remain in smaller aircraft, moderate growth in business aviation and high performance aircraft

is also anticipated. This is important to Napa County Airport because of the links between the local economy and business use of the airport.

- ▶ **Facilities and Services Available**—Existing general aviation facilities and services at Napa County Airport provide the majority of services necessary to support current operations. These services include flight training, fixed wing, major and minor maintenance for piston aircraft, minor turbine maintenance, fuel, charter, and sales. None of the airport's FBOs currently provides major maintenance for turbine-powered aircraft.
- ▶ **Demand for Hangar Space**—Increasingly, aircraft owners are seeking hangar space to store their aircraft. This is due to the fact that aircraft are increasing in value. Napa County Airport has land area available to develop a sufficient number of hangars to accommodate demand. Any increase in the number of based aircraft will be driven in part by the availability of additional, suitably priced, aircraft storage hangars. Future aircraft hangar sites are shown on the building area plan.
- ▶ **Surrounding Airspace**—Napa County Airport is located on the outer edge of the complex San Francisco Bay Area Class B airspace environment. Aircraft operating within the airspace of Napa County Airport and in the vicinity of the airport are constrained by aircraft operating to and from other Bay Area general aviation, military and air carrier airports.
- ▶ **Nearby Airports**—Seven public-use airports are located within 25 nautical miles of Napa County Airport. Of these airports, Buchanan Field, Gness Field, Nut Tree, and Petaluma Municipal airports have similar characteristics as Napa County Airport, providing comparable services to the majority of aircraft operating at Napa County Airport.
- ▶ **Proximity to Nearby Industry**—Napa Valley Gateway Business Park is a 386-acre mixed-use development located adjacent of Napa County Airport. This industrial park serves various businesses including light industrial, office, and research and development. Growth in major industrial and commercial businesses in surrounding areas has resulted in increased airport use by transient corporate and charter aircraft. This trend is expected to continue.

- ▶ **Demographics**—Population growth alone does not typically generate a corresponding increase in based general aviation aircraft demand. However, increased interest in flying and projected growth in pilot certificates suggests industry-wide growth in flight training and personal and/or recreational flying. The appeal of Napa County, an increasing population, and economic growth in the region should result in an increase in based aircraft at Napa County Airport.

Based Aircraft Forecast

At Napa County Airport, increases in the number of based aircraft will be dependent on decisions by individuals and businesses on where to base their aircraft. The availability of both reasonably priced hangar units, as well as their high-end counterparts, will largely determine whether growth in based aircraft matches demand.

The *Master Plan* forecast provides a high and low number for based aircraft. These numbers are based on variations in student enrollment of JAL's flight training program, the number of existing based aircraft and the potential for development of new hangar and/or tiedown at the airport. Accordingly, the total number of based aircraft is estimated to increase from its present level of 224 in 2001 to a low of 290 and a high of 340 by 2021. The majority of this growth is expected to take place in piston-powered aircraft. Moderate growth in based high corporate aircraft (e.g., turbojet and turbofan) is also anticipated.

Factors Affecting Operations Forecast

Various circumstances specific to Napa County Airport are relevant in determining future airport operational levels:

- ▶ **Number and Type of Based Aircraft**—The shift toward proportionately more high performance aircraft at Napa County Airport will tend to push operation counts upward more rapidly than the rate of based aircraft growth.
- ▶ **Availability of Facilities and Services**—It is anticipated that at least one new fixed base operation will be established or major expansion of an existing FBO will take place within the next five years.

- ▶ **Flight Training**—A large portion of the airport’s total annual operations currently involves flight training. By all indices flight training activity is expected to increase at Napa County Airport. The amount of such activity will be dependent upon the attractiveness of Napa County Airport as a place for training activity by student pilots, as well as the future plans of two primary FBOs currently offering flight training instruction.
- ▶ **Extent of Transient Aircraft Use**—Increased business, corporate, and industrial development within the communities surrounding Napa County Airport is expected to generate increased activity by both based and transient aircraft.

Operations Forecast

Aircraft **charter** provides scheduled air service for a specific fee, generally based on hours of operation.

Typically, **fractional ownership** allows individuals partial ownership or “fractional ownership” and accessibility of desired aircraft. The terms and conditions of fractional ownership vary. Primarily, fractional ownership is based on the cost of a desired aircraft, desired fraction of ownership (e.g., 1/4, 1/8, 1/16 etc.) and the number of hours flown.

Modest growth in annual aircraft operations at Napa County Airport is anticipated over the 20-year planning period. This growth will be generated by the increase in based and transient aircraft and greater utilization of aircraft by Napa County Airport-based active aircraft users. The upward trend in local operations will continue as a result of flight training operations by Bridgeford Flying Service and JAL. Transient activity is anticipated to increase over the next several years due in part to increased interest in flying, affordability of business aircraft (due to fractional ownership of corporate aircraft and the new line of small jets), and demand for charter services.

Table 2A summarizes the *Master Plan* 20-year forecast of future annual aircraft operations for Napa County Airport. The *Master Plan Activity Forecast* projects a low and a high number for operations over the planning period. Given that JAL’s flight training activity represents the majority of local operations at the airport, *Master Plan* projections are based on anticipated fluctuations of student enrollment in JAL’s flight training program. Accordingly, total annual aircraft operations are estimated to increase from 126,080 in 2001 to a low 210,000 operations or a high of 260,000 operations by the year 2021.

Airfield Design

OVERVIEW

An airport's airfield system includes the runways and taxiways, related approach and landing aids, and required clear areas beyond the runway ends and elsewhere adjoining these facilities.

This chapter addresses Napa County Airport's airfield environment. The basic configuration of the airfield will remain unchanged into the foreseeable future. Two principal airfield design issues are addressed in this chapter: substandard runway safety areas, and runway length requirements for the three runways. This chapter will address these two issues, as well as other airfield design requirements.

BASIC DESIGN FACTORS

Airport Classification

Airport Reference Code: A Federal Aviation Administration classification system that links aircraft characteristics (i.e., approach speed, weight, and wingspan) and approach type (i.e., visual, nonprecision, or precision) to airfield design criteria. The ARC classification system replaced the former FAA classification hierarchy of Basic Utility, General Utility, Basic Transport, etc.

For airfield design purposes, the Federal Aviation Administration has established a set of airport classifications known as Airport Reference Codes (ARC) applicable to each airport and its individual runway and taxiway components. The primary determinants of these classifications are the most critical types of aircraft a runway or taxiway is intended to serve and the form of instrument approach, if any, that is available or planned for the runway. Each ARC consists of two components relating to an airport's design aircraft:

- ▶ **Aircraft Approach Category** – Depicted by a letter (see sidebar below), this component relates to aircraft approach speed, an operational characteristic.

Aircraft Approach Category (speed)

- A: less than 91 knots
- B: 91 knots or more, but less than 121 knots
- C: 121 knots or more, but less than 141 knots
- D: 141 knots or more, but less than 166 knots

Airplane Design Group (wingspan)

- I: Up to but not including 49 feet
- II: 49 feet up to but not including 79 feet
- III: 79 feet up to but not including 118 feet
- IV: 118 feet up to but not including 171 feet
- V: 171 feet up to but not including 214 feet

- ▶ **Airplane Design Group** – Depicted by a Roman numeral, the second component relates to airplane wingspan, a physical characteristic.

Generally, Aircraft Approach Category applies to runways and runway related facilities. Airplane Design Group primarily relates to separation criteria involving taxiways and taxilanes.

Table 3A summarizes the FAA design standards associated with several ARC classifications potentially applicable to Napa County Airport. The significance of these standards with respect to individual components of the airfield design is discussed in subsequent sections of this chapter.

Design Aircraft

Napa County Airport is a designated reliever airport serving the general aviation needs of the northern San Francisco Bay Area. As noted in Chapter 2, the airport's service role is well established and is expected to remain essentially the same throughout the 20-year planning period. The purpose of future airfield improvements is to enhance, not expand, this established role. As a reliever airport, Napa County Airport is expected to provide needed services to a wide variety of aircraft sizes and types.

The majority of aircraft operations at Napa County Airport are generated by single-engine and twin-engine, general aviation aircraft that fall within Aircraft Approach Categories A, B, and C, and Airplane Design Groups I and II. Most of these aircraft have maximum certificated takeoff weights of less than 50,000 pounds. A few have significantly higher gross weights. Typical aircraft in these categories / groups include:

- ▶ Piper Cherokee (A-I)
- ▶ Beechcraft Baron (B-I)
- ▶ Learjet 55 (C-I)
- ▶ Gulfstream III (C-II)

For design purposes, the business class of aircraft can be considered the airport's critical aircraft. The specific critical aircraft is evaluated later in this chapter.

Instrument Approaches

Napa County Airport is presently served by two non-precision instrument approaches. Both users and management have

identified an urgent need for a precision approach. Such an approach would improve safety by offering a stabilized descent to the airport and would also allow the airport to remain operational during the seasonally sustained periods of fog that are inherent to the Napa Valley. Heightening this need is the increasing use by business operators, and the demand for corporate hangars.

RUNWAY 18R-36L

Classification

As used in this plan, the phrase corporate jet is intended to mean that class of aircraft designed for use as business or personal transportation. It excludes jet-powered aircraft designed for use in commercial passenger service. The term corporate jet is not intended to imply that the aircraft are being used for business purposes. Corporate jets may be used for business or personal transportation.

Currently, the most demanding class of aircraft regularly using Napa County Airport is those in Airport Reference Code (ARC) C-II. The airport does experience occasional operations by aircraft with longer wingspans and greater approach speeds, but these operations do not as yet exceed the FAA's 500 annual operation threshold that would increase the ARC. Although the role and character of the airport will not change, increased operations by quieter corporate jets with longer wingspans will require an increase in the ARC to C-III during this 20-year planning period. This is a national trend being experienced by most FAA designated reliever airports across the country. This trend is expected to be accelerated, due to increased use of corporate aircraft following September 11.

Runway Length

Existing

Runway 18R-36L is currently 5,932 feet long. The runway's length is sufficient for the existing demand, although it does impose limitations on some jet aircraft for some flights. The aircraft most affected are older, mid-sized corporate jets. During the hottest summer months, these aircraft either reduce the takeoff fuel or reduce their payloads. Additionally, the full length is often needed for instrument approaches due to tailwinds, wet runway conditions, and absence of a precision approach. Finally, for flights with very long stage lengths (e.g., direct to Japan), the runway is not currently long enough. However, direct flights to Hawaii have been made by Gulfstream jets.

Item	FAA Airport Design Standards ¹			
Airport Reference Code	B-I (small)	C-I	C-II	C-III
Aircraft Approach Speed	<121 kts	<141 kts	<141 kts	<141 kts
Aircraft Wingspan	<49 ft.	<49 ft.	<118 ft.	<79 ft.
Aircraft Weight Group (lbs)	≤12,500	>12,500	>12,500	>12,500
Approach Visibility Minimums	Visual or ≥¼ mile	≥¼ mile	Visual or ≥¼ mile	<¼ mile
Runway Design				
Width	60 ft.	100 ft.	100 ft.	100 ft.
Blast Pad				
Width	80 ft.	120 ft.	140 ft.	120 ft.
Length beyond Runway End	60 ft.	100 ft.	200 ft.	150 ft.
Safety Area				
Width	120 ft.	500 ft. ¹¹	500 ft. ¹¹	500 ft. ¹¹
Length beyond Runway End	240 ft.	1,000 ft.	1,000 ft.	1,000 ft.
Obstacle Free Zone²				
Shape ³	A	A	A	C
Width (W)	250 ft.	400 ft.	400 ft.	400 ft.
Vertical Height (H) ^{4,5}	NA	NA	NA	53 ft.
Slope (S) ⁶	NA	NA	NA	6:1
Object Free Area				
Width	250 ft.	800 ft.	800 ft.	800 ft.
Length beyond Runway End	240 ft.	1,000 ft.	1,000 ft.	1,000 ft.
Gradient (maximum)	2.0%		1.5%	1.5%
Runway Setbacks				
From Runway Centerline to:				
Parallel Runway Centerline ⁷	700 ft.	700 ft.	700 ft.	700 ft.
Hold Line	125 ft.	250 ft.	250 ft.	250 ft.
Parallel Taxiway	150 ft.	400 ft.	400 ft.	400 ft.
Aircraft Parking Line	125 ft.	500 ft.	500 ft.	500 ft.
Building Restriction Line ⁸	370 ft.		745 ft.	745 ft.
Helipad for:				
Small Helicopters (≤6,000 lbs.)	300 ft.	500 ft.	500 ft.	500 ft.
Medium Helicopters (≤12,000 lbs.)	500 ft.	500 ft.	500 ft.	500 ft.
Heavy Helicopters (>12,000 lbs.)	700 ft.	700 ft.	700 ft.	700 ft.
Taxiway Design				
Width	25 ft.	25 ft.	50 ft.	50 ft.
Safety Area Width	49 ft.	49 ft.	118 ft.	118 ft.
Taxiway and Taxilane Setbacks				
From Taxiway Centerline to:				
Parallel Taxiway/Taxilane ⁹	69 ft.	69 ft.	152 ft.	152 ft.
Fixed or Movable Object	45 ft.	45 ft.	93 ft.	93 ft.
From Taxilane Centerline to:				
Fixed or Movable Object	40 ft.	40 ft.	81 ft.	81 ft.
Runway Protection Zone¹⁰				
Width at Inner End	250 ft. ¹⁰	500 ft. ¹⁰	500 ft. ¹⁰	1,000 ft.
Width at Outer End	450 ft.	1,010 ft.	1,010 ft.	1,750 ft.
Length	1,000 ft.	1,700 ft.	1,700 ft.	2,500 ft.

Table 3A

Airport Design Standards
Napa County Airport

Notes:

- ¹ Source: FAA Advisory Circular 150/5300-13, Change 4, *Airport Design* (November 1994).
- ² Object Free Zone normally extends 200 feet beyond end of runway; additional length required for runways with approach systems.
- ³ Runway Obstacle Free Zone cross-section shapes:
- A:**



B:



C:

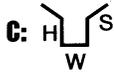

- ⁴ Height increases 3 feet per 1,000 feet of airport elevation.
- ⁵ Indicated dimensions for runways with approach visibility minimums <math>< \frac{3}{4}</math> mile are for Category I instrument runways. Criteria for Category II and Category III runways are more restrictive.
- ⁶ Maximum of 0.8% in first and last quarters of runway.
- ⁷ Indicated runway separation is for planning purposes. FAA air traffic control criteria permit simultaneous operations by light, single-engine propeller airplanes with runways as close as 300 feet apart and by twin-engine propeller airplanes with runway separation of 500 feet. [FAA Order 7110.656].
- ⁸ The FAA no longer has fixed-distance standards for the Building Restriction Line location. The indicated setback distances are based on providing 7:1 transitional slope clearance over a 35-foot building situated at the same base elevation as the adjacent runway and can be adjusted in accordance with local conditions.
- ⁹ Assumes same size airplane uses both taxiway and adjacent taxiway/taxilane. Distance can be reduced if secondary taxiway/taxilane is limited to use only by smaller airplanes.
- ¹⁰ For runways with approach visibility minimums of $\frac{3}{4}$ mile or more, but less than 1 mile, runway protection zone dimensions are 1,000 feet width at inner end, 1,510 feet width at outer end, and a length of 1,700 feet.
- ¹¹ For Airport Reference Code C-I and C-II, a runway safety area width of 400 feet is permissible.

Table 3A, continued

Future

Napa County Airport already accommodates the full range of corporate aircraft types, at least on an occasional basis. However, many of these aircraft must operate within constraints that range from minor to severe depending upon air temperature and stage length. The greatest operational constraints are on older mid-sized jets generally, and on trips with very long stage lengths. Neither of these constraints is especially significant to the airport given its current role. As noted in Chapter 2, this role is not forecast to change during the 20-year life of this master plan. Therefore, it is concluded that the existing runway length is adequate.

Although currently not anticipated, it is possible that the role of the airport will evolve to include a substantial volume of transcontinental and transoceanic flights by corporate aircraft. If this occurs, it would be appropriate to reconsider the issue of runway length. The magnitude of extension would depend upon the specific aircraft and stage length to be accommodated. The range could be quite large. The FAA's runway length program taken from Advisory Circular 150/5325-4A, *Runway Length Requirements for Airport Design* indicates that a runway length of 7,000 feet would be required to accommodate 75% of large aircraft under 60,000 pounds at 90% of their useful load. To accommodate 100% of these aircraft at 90% of their useful load 7,700 feet of runway would be needed. If corporate aircraft larger than 60,000 pounds are considered, a runway length of 9,000 feet (or longer) might be required. The hypothetical runway lengths described in this paragraph are presented solely as background information. No change in the current runway length is proposed.

Runway Width

Runway 18R-36L is currently 150 feet wide. This width exceeds the FAA standard of 100 feet for ARC C-III runways accommodating aircraft up to 150,000 pounds gross weight. The reduction in maintenance costs that would accompany a reduction in width is offset by the costs of relocating the edge lights. Furthermore, there may be some safety benefit to the additional width given the occasional use by larger aircraft and the significant crosswinds associated with instrument approaches to Runway 36L. Accordingly, it is recommended that the current width be retained.

Pavement Strength

Runway 18R-36L is constructed of Portland cement concrete with an asphaltic concrete extension. It was originally constructed in 1942 for use as a military airbase. The published weight bearing capacity is 50,000 pounds (dual wheel gear configuration). The weight limitation is attributable to a low-strength 600-foot asphalt extension to the northern end of the runway that was constructed in 1973.



Gulfstream G-V

As previously described, the trend is toward larger corporate aircraft types, greater travel distances, and higher payloads. For design purposes, the Gulfstream-V (G-V) is representative of this class of corporate jet. The G-V has a maximum certificated takeoff weight of up to 96,000 pounds. Use by these heavier aircraft-types imposes additional stress on the airfield pavements, resulting in increased maintenance costs and risk of pavement failure. The runway pavement should be strengthened as needed to accommodate this class of aircraft, particularly the 600-foot asphalt portion. This may require removal of a weight limitation ordinance introduced by the initiative process.

RUNWAY 18L-36R

Classification



Runway 18L-36R is oriented parallel to the Napa County Airport's main runway, Runway 18R-36L. It is located 500 feet east of the main runway. Due to its length ((2,500 feet) the runway is used almost exclusively by single-engine, piston aircraft. Therefore, this runway is designated as Airport Reference Code (ARC) A-I. This runway serves two roles:

- ▶ Providing a runway for flight training independent of the main flow of air traffic
- ▶ Providing additional airfield capacity to minimize delays during periods of peak use

The roles of this runway will remain unchanged during the life of this plan (nominally 20 years).

Runway Length

Existing

Touch and go: A flight-training maneuver where an aircraft lands and then takes off without coming to a complete stop.

Runway 18L-36R is currently 2,500 feet long. The runway's length is marginally adequate for use as a training runway. The length is adequate for landings and takeoffs by single-engine, piston aircraft. However, the length is marginal for touch-and-goes. This significantly reduces the value of the runway for its intended purpose. Additionally, this length offers limited peak period capacity because it only serves the smallest aircraft.

Future

Runway 18L-36R is proposed to be extended to just beyond its intersection with Runway 6-24. This will give the runway a length of 4,000 feet. With this additional length, the runway will support touch-and-go operations by all single-engine aircraft. This would have two benefits:

- › Reduce congestion and delays on the main runway
- › Reduce the frequency of overflights of the residential area located west of the airfield by training aircraft

The proposed extension will also expand the range of aircraft that it can accommodate in its second role of providing additional capacity during peak periods. The additional length will enable the runway to serve piston twins, many turboprops, and smaller jets.

The extension of 18L-36R will affect operations on Runway 6-24. Operations on the two runways will be dependent. That is use of one runway precludes the use of the other at the same time. However, as the main runway, Runway 18R-36L, already intersects Runway 6-24, the effect on airfield capacity will not be significant.

Runway Width

Runway 18L-36R is currently 75 feet wide. This width exceeds the FAA standard of 60 feet for ARC A-I. As the incremental cost of maintaining the additional 15 feet of width is low, no change is proposed.

Pavement Strength

Runway 18L-36R is constructed of asphaltic concrete. The published weight bearing capacity is 12,500 pounds (single wheel gear configuration). This meets the criteria for accommodating all small aircraft. No change is required to meet the runway's roles.

RUNWAY 6-24

Classification

Runway 6-24 is the designated crosswind runway. It is located on the southern side of the airfield. Due to its length (5,008 feet), width (150 feet), and bearing capacity (70,000 pounds dual gear configuration), the runway is designated as Airport Reference Code (ARC) C-II. Like the main runway, this runway can expect to see increased use by corporate jets with wingspans long enough to place them in ARC C-III. However, this runway's role of crosswind runway will remain unchanged during the life of this plan.

Runway Length

Existing

Runway 6-24 currently has a length of 5,008 feet. Crosswind runways are typically designed to provide 80% of the length of the main runway. The logic is that when winds are strong enough to require use of a crosswind runway, the headwinds will reduce the runway length required for both landings and takeoffs. Runway 6-24 is 262 feet longer than required to meet the 80% standard for crosswind runways.

Future

As the main runway is not proposed to be extended, no extension of Runway 6-24 is required to fulfill its role as a crosswind runway.

Runway Width

Runway 6-24 is currently 150 feet wide. This width exceeds the FAA standard of 100 feet for ARC C-III runways accommodating aircraft up to 150,000 pounds gross weight. The reduction in maintenance costs that would accompany a reduction in width is offset by the costs of relocating the edge lights. Furthermore, there may be some safety benefit to the additional width given the occasional use by larger aircraft. Accordingly, it is recommended that the current width be retained.

Pavement Strength

Runway 6-24 is constructed of Portland cement concrete. The published weight bearing capacity is 70,000 pounds for aircraft with dual main gear. As with the main runway, this runway

occasionally sees use by dual-wheeled aircraft in the 90,000 to 100,000 pound range. Use by this class of aircraft is expected to increase during the 20-year planning period. Therefore, it is recommended that this runway be strengthened to provide the same weight-bearing capacity as the main runway when it is strengthened.

RUNWAY CAPACITY

An airport's airfield capacity is generally measured in terms of the number of aircraft operations the runway and taxiway system can accommodate in an hour or a year. Airports can continue to operate above these theoretical limits, but would experience significant delays. On an annual basis, airfield capacity is referred to as Annual Service Volume.

Napa County Airport's annual service volume is over 310,000. This level is above any currently foreseeable activity projections. Peak-period capacity is not likely to be a limitation either, although there may be occasional brief delays during high levels of flight training activity or during periods of inclement weather. Average throughput capacity is approximately 172 VFR operations per hour and 59 IFR operations per hour. Actual IFR hourly capacity is probably lower due to longer than average approach and missed approach paths.

OTHER RUNWAY DESIGN CONSIDERATIONS

Runway Approaches

Napa County Airport is presently served by two non-precision instrument approaches: a localizer-only approach to Runway 36L and a VOR or GPS approach to Runway 6. Of these two approaches, the localizer approach has the lowest approach minimums: 346 feet above the touchdown zone elevation and $\frac{3}{4}$ -mile visibility (346- $\frac{3}{4}$).

The prevailing winds favor an instrument approach to Runway 18R. However, the existing Southern Pacific railroad tracks and high terrain preclude the development of an instrument approach to that runway. High terrain and the Travis Air Force Base to the east have historically precluded a straight-in approach procedure to Runway 24 as well. Consequently, the airport's two published non-precision approaches are often executed with a non-favorable

tailwind component. This creates an undesirable effect on the airport's instrument operations as follows:

- ▶ Instrument approaches during instrument conditions.
- ▶ Step-down descent profile in lieu of a stabilized constant descent profile.
- ▶ Likely tailwind component during final approach and landing.
- ▶ Potentially wet runway conditions during rollout.

ILS - Instrument Landing System.

Runway 36L was designated as a future precision instrument runway in 1976. Since that time, the airport has installed most of the components needed to obtain an ILS-based precision approach: localizer antenna, medium intensity approach lighting system (MALS), and an outer marker radio beacon. However, the most important component needed to provide vertical guidance, the glide slope antenna, has not yet been installed. A future glide slope location has been reserved approximately 900 feet north and west of the runway intersection. Because the glide slope antenna uses the ground in front to reflect the electronic signal, it requires a large, clear and level area in front of the antenna. Upon installation and certification, the glide slope would provide a stabilized approach (i.e., constant descent rate) with positive course guidance and lower approach minimums to Runway 36L (approx 250-³/₄).

This master plan also recommends upgrading the approach lighting system by installing Runway Alignment Indicator Lights (RAILs). This would conceivably enable the approach minimums to reduce further, as low as 200-¹/₂. Essentially, this upgrade would extend the existing medium intensity approach lighting system an additional 1,000 feet. The environmental implications of this extension are discussed in Chapter 5.

Advancements in the satellite-based global positioning system (GPS) and computer technologies also make lower approaches to other runways possible. The existing VOR/GPS approach to Runway 6, for example, can potentially be reduced to ³/₄-miles by adding an approach lighting system such as a MALS or ODALS. Likewise, procedures can now be designed to provide a stabilized approach with airborne vertical guidance similar to that provided by a standard ILS. Such an approach would increase the size of the Runway Protection Zone (RPZ) and airport imaginary surfaced described in the U.S Code of Federal Regulations, Chapter 14, Part 77 (C.F.R. 14 Pt 77). At this time, the existing approaches are presumed to be adequate providing a full-ILS approach to Runway 36L can be implemented in the immediate term.

Runway Safety Area

The Runway Safety Area (RSA) is a prepared surface surrounding the runway that reduces the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway. In 1999, FAA Order 5200.8 established the Runway Safety Area Program, identifying the RSA as a vital safety component of the airfield. To this end, the FAA has made it a priority to enhance the nation's RSAs to the maximum extent practical and has committed significant funding solely for this purpose. In addition, it is no longer FAA policy to accept modifications to the design standards (waivers), but rather, to initiate a program whereby the available RSA is incrementally enhanced to meet standards.

Over the years, two items have consistently changed the RSA requirement for Napa County Airport: changing airport roles and changing federal design standards. As a result of these changes, the RSA requirement has increased substantially since the previous master plan (adopted May 28, 1991). FAA design standards for ARC C-II facilities such as Napa County Airport, specify a 400-foot wide RSA, centered on the runway centerline be provided throughout the entire runway length and 1,000 feet beyond each end of the runway. However, the maintained RSA falls short of both the old and new standards. Figure 3A, *RSA Evaluation*, graphically depicts the RSA shortfalls. Given the airport's defined role as a reliever airport within the national system and the types of aircraft that are presently using the airport, alternatives that would result in a reduced runway length were dismissed from consideration during this master plan update.

RSA DESIGN STANDARD

Current ARC (C-II):

400 FT width extending 1,000 FT beyond each runway end.

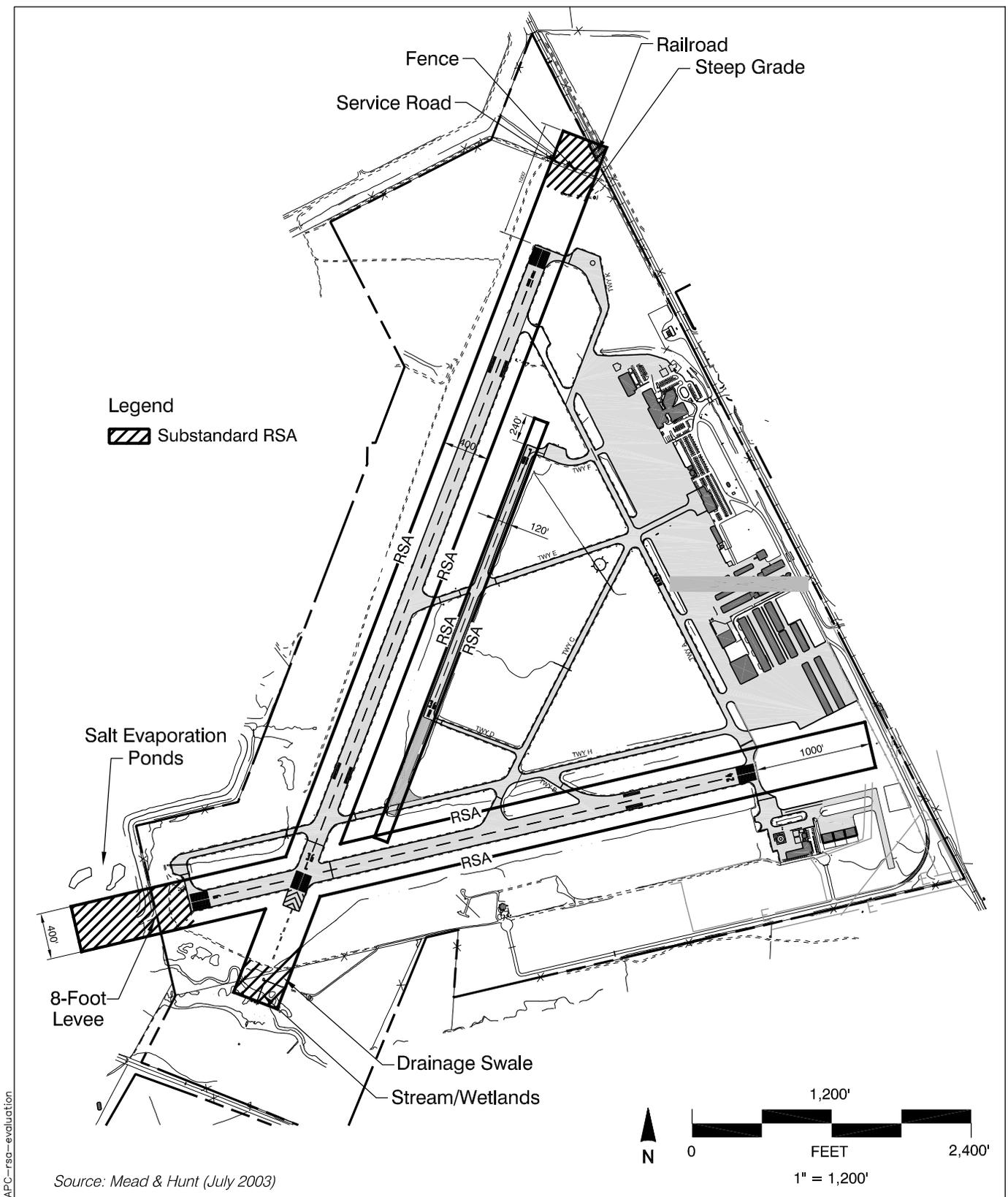
Future ARC (C-III)

500 FT width extending 1,000 FT beyond each runway end.

Runway 18R-36L Evaluation

The following actions are needed to maximize the available RSA. At the northern end:

- › Fill and grade north of the localizer antenna to resolve the steep drop off and comply with grading standards.
- › Modify the dirt service roads as needed to meet grading requirements and remove any hazardous ruts.
- › Relocate the perimeter fence to the edge of the railroad-right-of-way.
- › Extend the RSA all the way to the railroad right-of-way even beyond the 1,000-foot requirement on the northwest corner to offset that portion lost to the railroad on the northeast corner.



APC-rsa-evaluation

Figure 3A

**RSA Evaluation
 Napa County Airport**

At the southern end:

- › Drain and remove the drainage swale, which transects the area about 300 feet beyond the edge of the paved overrun.
- › Modify the dirt service road to meet grading requirements and remove any hazardous ruts.
- › Remove / relocate any fencing within the RSA bounds.
- › Initiate an environmental assessment to evaluate the impacts associated with a southward RSA extension.
- › Work with the FAA to extend the RSA to the south, performing the necessary environmental mitigations.

The above actions will significantly improve the RSA above what they are today. However, the environmental constraints on the south end could form a physical barrier similar to the railroad tracks on the north end, ultimately limiting the total RSA that can be provided. Hence, another RSA evaluation may be necessary after the implementation of the elements listed above.

Runway 6-24 Evaluation

Runway 6-24 meets the RSA requirements along the entire runway length and 1,000 feet beyond the Runway 24 end. However, the RSA does not extend much beyond the Runway 6 end. The following actions are needed to expand the RSA to the south:

- › Fill and grade the drop off immediately southwest of the Runway 6 threshold.
- › Remove obstacles as needed and eliminate any remaining agricultural leases within the standard RSA bounds.
- › Initiate acquisition of the salt ponds southwest of the 8-foot levee.
- › Initiate an environmental assessment to determine the impacts and potential mitigation measures needed to extend the RSA through the levee and into the salt pond area.
- › Perform the recommended mitigation measures and extend the RSA to the southwest to the extent permissible.

If successful, the above program would greatly enhance the RSA available. A future RSA evaluation and alternatives may need to be evaluated in the future given the potentially significant environmental considerations that may be generated.

Runway 18L-36R Evaluation

Unlike the other runways, Runway 18L-36R is planned to serve only small aircraft. The existing RSA meets requirements. The RSA must be extended when the planned runway extension to the south is initiated.

Obstacle Free Zones

Obstacle Free Zone- The obstacle free zones (OFZ) is the airspace along the runway and extended runway centerline that is required to be clear of all objects, except for frangible visual NAVAIDs that need to be located in the OFZ because of function. In order to provide clearance protection for aircraft landing or taking off from the runway, and for missed approaches.

The OFZ dimensions for both Runways 18R-36L and 6-24 are the nearly the same since both runways are used regularly by large aircraft (> 12,500 pounds). An OFZ for a runway with these characteristics is 400 feet wide and extends 200 feet beyond each runway end. No object, except for frangible NAVAIDs, can extend above an elevation equivalent to the runway centerline elevation at the nearest point. Both runways currently meet or exceed this standard.

An inner-approach OFZ exists in the approach area to Runway 36L. It begins at the edge of the Runway OFZ and extends outward 200 feet beyond the last light of the approach lighting system. The width is the same as the runway OFZ (400 feet). The inner-approach OFZ has a 50:1 incline beginning at the runway end elevation, which no object may penetrate. The inner approach OFZ will extend approximately 1,000 feet when the recommended RAILs are added to the approach lighting system.

Parallel Runway 18L-36R's OFZ is only 250 feet wide since only small aircraft use the runway. The planned runway extension will result in an in-kind extension of the Runway OFZ.

Runway Object Free Areas

Object Free Area (OFA) - a two-dimensional ground area surrounding the runway. The OFA clearing standards preclude parked airplanes and objects, except objects whose location is fixed by an aeronautical function. The OFA should be under the direct control of the airport operator. This designated area is relatively new to airport design standards and was not discussed in the previous master plan.

FAA design standards for ARC C-II facilities, such as Runways 18R-36L and 6-24, specify that the OFA be 800 feet wide the full length of the runway and extend a minimum of 1,000 feet beyond the ends of runway pavement.

The approach end to Runway 18R does not fully meet the recommended design standards because the railroad line slices the through the northeast corner. Even though this existing configuration does not meet current OFA standards, it is judged to be acceptable given that the RSA improvement will greatly enhance the overall operating safety of the airport. A note will be added to

the airport layout plan highlighting this modification to airport design standards.

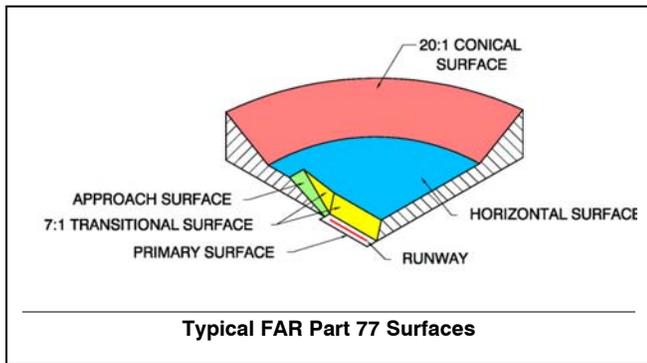
The planned extension to Runway 18L-36R will result in an in-kind extension of the OFA, which will extend 240 feet beyond each runway end at a width of 250 feet.

FAR Part 77 Imaginary Surfaces

Federal Aviation Regulations (FAR) Part 77, *Objects Affecting Navigable Airspace*, identifies the airspace necessary to ensure the safe operation of aircraft to, from, and around airports. This airspace is defined for each airport by a series of imaginary surfaces. The dimensions and slopes of these surfaces depend on

the configuration and approach categories of each airport’s runway system. Generally, most critical among the FAR Part 77 surfaces are the approach surfaces.

Napa County Airport enjoys published instrument approaches to two runway ends. With the exception of the Runway 36L approach, which will be upgraded to a precision instrument approach with the installation of a glide slope antenna, no new improvements are anticipated. The approach upgrade to Runway 36L will dramatically increase the size and shape of the approach surface. However, this increase was accounted for in 1976, when an ILS approach to that runway was originally conceived. The other anticipated change to the current airspace will occur when Runway 18L-36R is extended, but the extension was also evaluated in the previous plan.



Runway Protection Zone (RPZ)

Runway Protection Zone (RPZ) - A trapezoidal area beyond each end of an airport runway. The RPZ is centered on the extended runway centerline. The FAA refined the purpose of an RPZ since the 1991 plan from enhancing the safety of aircraft operations to that of enhancing the protection of people and property on the ground. The term “Runway Protection Zone” has replaced the formerly used term “Clear Zone”.

The FAA recommends that an airport’s operators acquire sufficient property interest in Runway Protection Zones to control the use of land within those areas. Ideally, Runway Protection Zones should be clear of all objects other than aviation-related objects that functionally must be located there.

At Napa County Airport, the County does not control substantial portions of the Runway Protection Zones. At the time of writing, the County applied for a federal grant to acquire property within the Runway 18R and Runway 6 RPZ, which do not presently have any incompatible land uses. A large portion of the Runway 24 RPZ

is currently developed. It is recommended that the County obtain the necessary height limitation, land-use, and noise easements for those non-airport parcels southwest of the railroad lines.

The existing RPZ dimensions are provided on the following table.

	18R	36L	6	24	18L	36R
Length	1,700	1,700	1,700	1,700	1,000	1,000
Inner-Width	500	1,000	500	500	250	250
Outer-Width	1,010	1,510	1,010	1,010	450	450

Since the previous master plan the following RPZ changes have occurred and are reflected in the airport layout plan.

- ▶ **Runway 18R** – the inner-width requirements have reduced from 1,000 feet to 500 feet, while the length has increased from 1,000 feet to 1,700 feet.
- ▶ **Runway 24** – The RPZ size has increased as previously planned as a result of regular operations by large aircraft (over 12,500 pounds).
- ▶ **Runway 36L** – The RPZ will increase in size as previously planned to accommodate the planned precision approach to that runway. The County already controls the majority of property within the expanded RPZ area.

Building Restriction Lines

The building restriction line defines the limits of development of all on-airport structures, except facilities required by their function to be located near runways and taxiways. The FAA *Airport Design* Advisory Circular no longer establishes standard setback distances or building restriction lines. Rather, the FAA recommends that the BRL encompass the following items defined on the airport layout plan:

- ▶ Runway Protection Zones,
- ▶ Runway Visibility Zone between intersecting runways,
- ▶ Controller line-of-sight,
- ▶ NAVAID critical areas,
- ▶ Aircraft Parking Restriction Lines,
- ▶ Taxiway/Taxilane Object Free Areas, and

- ▶ Part 77 surface restrictions to building heights (typically, a 35-foot elevation above the runway centerline elevation is used to establish development policy).

Napa County Airport has two established building areas: the terminal area and the south-side building area.

- ▶ **Terminal Building Area**—The main building area has long been established along Taxiway A. Although this area may experience pressure to expand westward across the taxiway in the future, such development is not anticipated while the south-side building area continues to offer development opportunity. For purposes of this master plan, the Taxiway A OFA is the primary restriction to aircraft parking and building development. As previously mentioned, an increase in the critical aircraft will increase the APL/BRL to 76 feet from the centerline of Taxiway A. At least two tie-down positions within the IASCO/JAL leasehold will need to be relocated as the 76-foot clearance criteria also applies to Taxiway K.

The existing terminal building area is also defined by the clearance requirements and height restrictions of all three runways. There are currently aircraft parked within the existing aircraft parking restriction line associated with Runway 6-24, which is 400 feet from the runway centerline. This setback requirement is anticipated to increase to 500 feet as large aircraft operations increase on Runway 6-24. The setback requirements could require the relocation of as many as 10 T-hangar units and 25 tie-down positions.

- ▶ **South Side Building Area** – Future hangar development on the airport's south side should provide a 500-foot aircraft parking restriction line as measured from the Runway 6-24 centerline. This separation will also provide adequate clearance for aircraft taxiing on Taxiway J. The existing building restriction line of 565 feet is adequate and will be retained for this master plan.
- ▶ **Future Development Sites** – Although this master plan does not produce any other development sites. The airport layout plan will include appropriate restriction lines for all areas within the airport's property.

OTHER AIRFIELD DESIGN ELEMENTS

Runway Lighting, Marking, and Visual Approach Aids

Runways 18R-36L and 6-24 are equipped with medium-intensity runway lighting. This lighting is in good condition and is suitable for the runway's current use. When a precision approach to Runway 36L is developed, the runway lighting should be upgraded to high-intensity edge lights. Runway 18L-36R is currently not lighted. As both longer runways are lighted, adding runway edge lights is not judged to be cost-effective.

Runways 18R-36L and 6-24 currently have nonprecision markings. When a precision approach to Runway 36L is developed, precision markings should be added. Runway 18L-36R has basic markings. These should be retained, as no changes in the runway's approach category is proposed.

The approach end of Runway 18R is equipped with a Precision Approach Path Indicator (PAPI-4L) with an approach slope of 3.25 and a threshold crossing height of 52 feet. It is recommended that PAPIs be installed to serve approaches to both ends of Runway 6-24.

Hold Lines

The FAA requires hold lines on all taxiways intersecting with runways. The hold lines painted on the exit taxiways for Runway 12-30 are set 250 feet from the runway's centerline. This conforms to the FAA standards for a runway with Airport Reference Code C-III.

Wind Indicators and Segmented Circle

There is currently one wind cone located near the center of the airfield. It is co-located with the segmented circle approximately near the intersections of Taxiways C and E.

TERMINAL VOR

Scaggs Island VORTAC is located approximately 5 miles west of Napa County Airport. This navigational aid serves both enroute aircraft in the San Francisco Bay Area, and aircraft arriving and departing Napa County Airport. There is the potential that this facility will need to be relocated as a result of proposed large-scale wetlands development. (See Figure 3-B). In the event that a need to relocate the VORTAC occurs, a site on the Napa County Airport has been designated. The site is located near the center of the airfield.

VOR: Very-high-frequency Omnidirectional Range station. A navigational aid that can provide course guidance information for both enroute navigation and instrument landings.

VORTAC: A VOR collocated with a military Tactical Air Navigation system.

Helipads

In order to meet ongoing demand, a helipad was recently constructed to provide a facility for transient helicopter operations. The design helicopter is the Bell Textron 206 Jet/Long Ranger. This helicopter has a rotor diameter of 37 feet, and an overall length of 43 feet. One touchdown pad and six parking pads are provided. One elongated parking pad is provided that can serve either two of the design helicopter, or one larger helicopter. This elongated pad will accommodate the occasional use of the facility by the Coast Guard, National Guard, or other users.

TAXIWAY SYSTEM

Napa County Airport is generally well served by its existing taxiway system. The improvements recommended in this section are motivated by the following objectives:

- ▶ To accommodate hangar development on the airport's southside.
- ▶ To accommodate the increasing prevalence towards larger business-jets.
- ▶ To enhance the efficiency of airport operations.

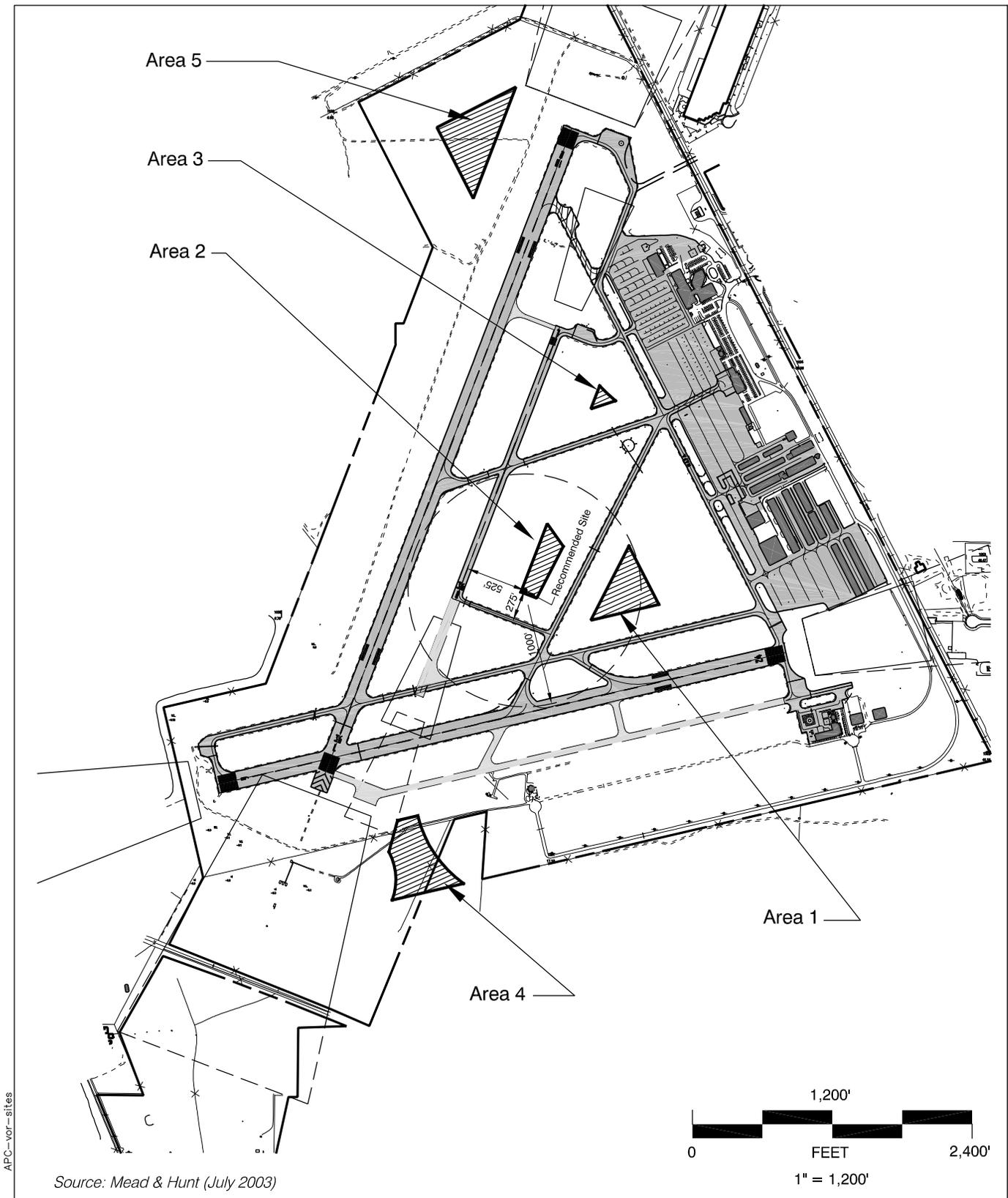


Figure 3B

Potential VOR Sites

Napa County Airport

The Gulfstream-V aircraft was selected as the design aircraft for all taxiways excluding Taxiways D and F, which are exclusively used by small aircraft only. Since the lateral setbacks are aircraft-specific to a 94-foot wingspan instead of the 118-foot wingspan of ARC C-III, a note will appear on the airport layout plan to highlight this modification of airport design standards. This plan also utilizes the Gulfstream-V for pavement strength purposes, radius of taxiway turns, and fillet design. Cockpit-over-centerline steering is assumed for all taxi-turns.

Figure 3-C, *Taxiway Improvements*, depict the taxiway improvements that are described in this section.

South-Side Taxiway Construction

The previous master plan recommended the construction of a partial parallel taxiway to support the anticipated hangar development on the airport's south side. As of this writing, site preparation for the entire length is complete and the eastern-most portion of Taxiway J is paved and operating. Two taxiway connectors are also planned: an exit taxiway across from Taxiway B and an extension to Taxiway C.

As designed, the centerline of Taxiway J will be positioned 400 feet from the centerline of Runway 24. A small segment of the taxiway, approximately 450 linear feet, will serve as a standard right-angled entrance Taxiway to Runway 36L. Since the design aircraft is the Gulfstream-V, pavement strength will be sufficient to support regular operations by aircraft with weights of approximately 100,000 pounds. In addition, the minimum aircraft-specific wingtip clearance criteria must also be provided: 123 feet between the centerline of Taxiway J and any apron-edge taxilane and 76 feet between the Taxiway J centerline and any fixed or movable object.

Taxiway Improvements to Accommodate Larger Aircraft

The taxiway improvements needed to accommodate the Gulfstream-V critical aircraft fall into three categories: additional pavement strength, additional pavement fillet at certain taxiway intersections, and increased setback clearances along Taxiways A and K.

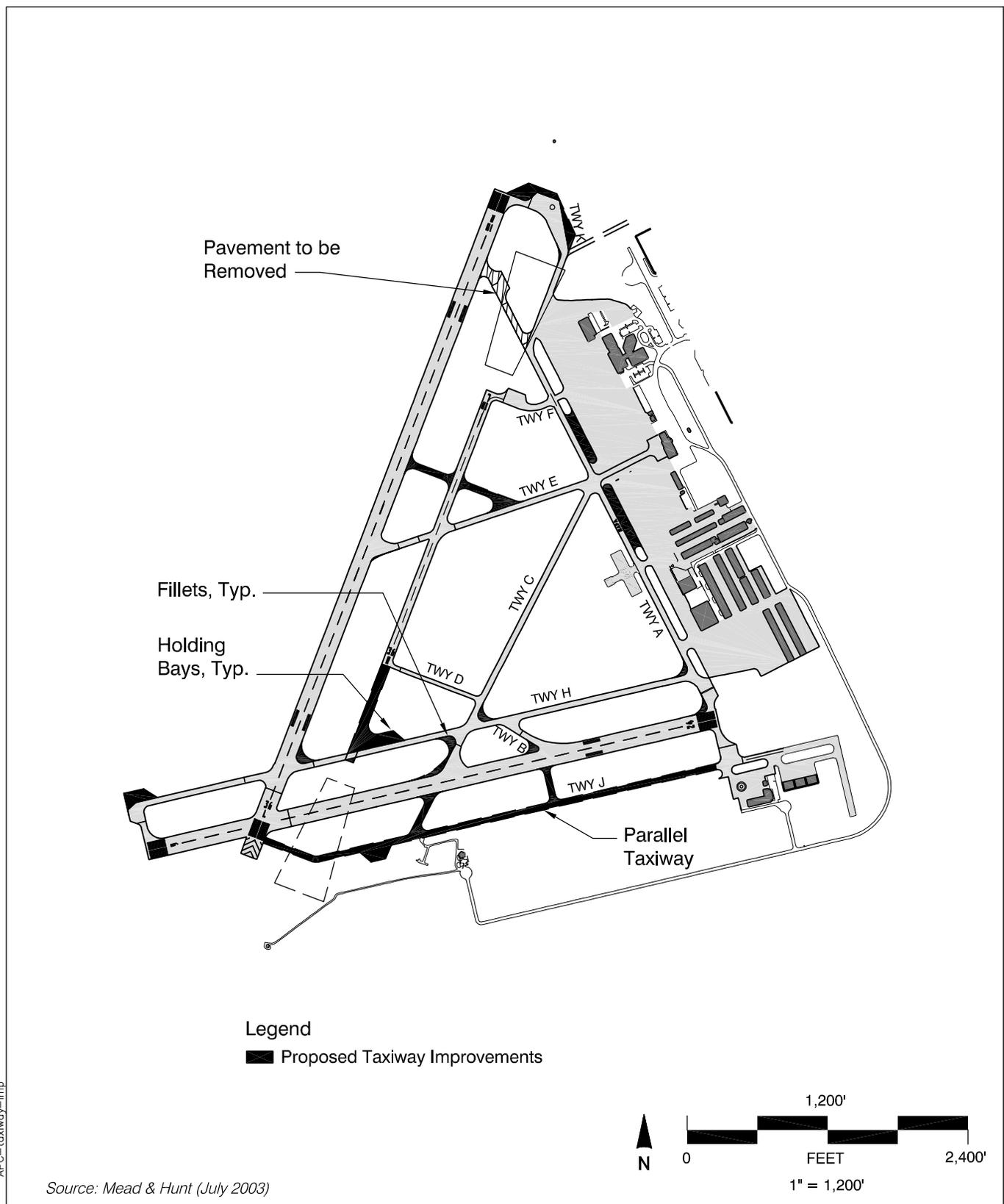


Figure 3C

Taxiway Improvements

Napa County Airport

- ▶ **Additional Pavement Strength** – Additional pavement strength is recommended on all main taxiways. The strengthening program should be incorporated into Napa County Airport’s routine pavement maintenance program. The program and increased cost of maintenance are reflected in the Capital Improvement Program included in Chapter 6.
- ▶ **Additional Paved Fillet at Taxiway Intersections** – The standard turning radius for a Gulfstream-V aircraft is 100 feet. In addition, the longer wheel base (distance from not gear to main gear) and wider wheel track (width of main gear) creates the need for additional pavement fillet at taxiway intersections to ensure the main gear tires stay on pavement during taxi-turns. Fillet lead-in pavement is also recommended in advance of the intersections. The additional fillet, which is anticipated for approximately 6 intersections, should be constructed during the next pavement rehabilitation. Construction phasing and costs have been incorporated into the Capital Improvement Program included in Chapter 6.
- ▶ **Increased Setback Clearances (Taxiways A and K)** – Although both the wingtip clearance requirements and graded taxiway safety areas will increase for all of the taxiways, Taxiways A and K are the most critical since they connect the main terminal area to the airfield environment. The aircraft parking restriction line should be increased to 76 feet from the centerlines of Taxiways A and K. As presently designed, this increase may require the removal of two or more parking positions within the IASCO/JAL leasehold that are too close to Taxiway K.

Taxiway Improvements to Enhance Airport Efficiency

Several improvements are recommended that will improve the efficiency of the airport at a few common airfield choke points. These improvements fall into three categories: runway exit/connector taxiways, holding bay / bypass taxiway enhancements, and Taxiway C/E choke point improvements.

- ▶ **Exit/Connector Taxiway Construction** – Runway 18R-36L has only three taxiway connections along its entire 5,932-foot length: an entrance taxiway at the north end (Taxiway K), an angled mid-field exit taxiway (Taxiway E), and the parallel taxiway to Runway 6-24 which is used as an exit taxiway for Runway 18R arrivals (Taxiway H). An additional exit taxiway is

recommended north of Taxiway E that will not interfere with the operation of parallel Runway 18L-36R. This taxiway will cross the Runway 18L-36R without interfering with a potential departure queue at Runway 18L and terminate at Taxiway E.

- ▶ **Holding Bay / Bypass Taxiway Enhancements** – The primary departure runway, Runway 18R, does not have any bypass capability. Furthermore, the existing holding bay is often filled during peak flight training periods and when a large aircraft is queuing for departure. The plan recommends expanding the existing holding bay at the hold line to support bypass capability. Additional holding bay improvements include:
 - › An expansion of the Runway 6 hold bay.
 - › Construction of a hold bay at the along future Taxiway J, primarily to support potential Runway 36L departures. This holding bay should be constructed so as to remain clear of the Runway 36R arrivals.
 - › Construction of a hold bay at the future Runway 36R threshold. This holding bay was previously planned, but should be constructed north of Taxiway H, not south.

- ▶ **Taxiway C/E Choke Point Improvements** – As described in a later section, the grass islands between the existing transient apron and Taxiway should be paved as shown in Figure 3-C to improve circulation within the terminal area. Intermediate hold position markings are also recommended for Taxiways A, C, and E.

Taxiway Marking and Lighting

The full-length parallel Taxiway D and the runway exit taxiways are equipped with medium intensity taxiway lighting. Taxiway D and the runway exit taxiways are appropriately marked with centerline stripes, edge stripes, and appropriate hold lines. Centerline stripes also exist on taxilanes throughout the building area.

Hold Lines

The FAA requires hold lines on all taxiways intersecting with runways. The hold lines at the access/exit taxiways serving Runway 12-30 are located 250 feet from the runway centerline. These hold lines are located and marked in accordance with FAA standards.

Signing

Lighted exit taxiway and hold line signs have been placed adjacent to the runway and exit taxiways. No deficiencies in signage have been identified.

Building Area Development

OVERVIEW

The building area of an airport encompasses all of the airport property not devoted to runways, major taxiways, required clear areas, and other airfield-related functions. This chapter examines the factors that affect the siting of future building area facilities at Napa County Airport and alternative ways of accommodating projected demand. The focus is on providing direction for the appropriate expansion and use of the core building areas of the airport. The various design issues associated with Napa County Airport are discussed in the sections that follow. The *Building Area Plan* enclosed with the *Master Plan* report presents the recommended layout of facilities for these areas.

It should be recognized that there are two distinct building areas on the airport. The principal building area is located east of Taxiway A. It fronts on Airport Road. Most of the airport's facilities are located in this area. Most aircraft storage hangars, fueling facilities, several fixed base operators, a restaurant and the airport staff's office are located on this side of the airfield. The second building area is located on the south side of the airfield. This second building area includes the air traffic control tower, the California Highway Patrol's aviation unit, and several large hangars.

Design Factors

Many factors influence the planning and, later, the development decisions associated with Napa County's two building areas. Most of these factors can be grouped under five basic headings:

- ▶ **Demand**—The demand for additional building area facilities at Napa County Airport is forecast to be significant over the next 20-year planning period. As documented in Chapter 2, the number of based aircraft is forecast to increase by between 29% and 52% by 2022, from the current 224 aircraft to between 290 and 340 aircraft.

About 81% of the aircraft currently based at Napa County Airport are single-engine, piston-powered aircraft. However, the airfield sees use by the full spectrum of aircraft: piston twins, turboprops, corporate jets, and helicopters. It is anticipated that the airport will see increasing use by turboprops and jets.

Demand for new fixed base operator (FBO) leaseholds is expected to be limited. However, the existing full-service FBO is expected to expand its facilities. There is also the potential that a few additional specialized FBOs may be developed during the life of this plan. A specialized FBO offering charter/fractional ownership services is a potentially viable near-term addition.

Taxiway — A defined path, from one part of an airport to another, selected or prepared for the taxiing of aircraft.

Taxilane — The portion of the aircraft parking area used for access between taxiways, aircraft parking positions, hangars, fixed base operators, etc.

- ▶ **Setback Distances**—The interior boundary of the airport building areas is determined in large part by the necessary setback distances from the nearest runway and taxiways. Based upon design criteria discussed in the preceding chapter, the following design criteria are recommended:
 - › A minimum of 76 feet from the centerline of Taxiways A and K to buildings in the main building areas.
 - › A minimum of 500 feet from the centerline of Runway 6-24 to new structures and tiedowns in the southern end of the main building area.
 - › A minimum of 500 feet from the centerline of Runway 6-24 to parked aircraft in the south-side building area.
 - › A minimum of 565 feet from the centerline of Runway 6-24 to structures in the south-side building area.
 - › The building areas at Napa County Airport are subdivided into distinct areas designed to accommodate aircraft with particular wingspan. Each area's wingtip clearance is based upon FAA design standards in Advisory Circular 150/5300-13 (Change 6).

- ▶ **Existing Facilities**—Generally the facilities at Napa County Airport are expected to remain viable throughout the 20-year planning period. Of course, periodic maintenance will be required to preserve the functionality of airfield pavement, structures, and associated drainage and utilities. Only the existing terminal building will clearly require replacement. The age and layout of the terminal building is increasingly becoming a constraint. Additionally, the facility makes a poor visual impression as a gateway to the internationally known Napa Valley. Additionally, there is the potential that the oldest T-hangars may become excessively costly to maintain by the end of the planning period.
- ▶ **Accessibility**—An important design consideration is the ease of access to individual portions of the building areas from both the taxiway system and public roads.

At Napa County Airport, Taxiway A provides adequate access to the main (east-side) building area. Taxiway A is conveniently linked to the taxiways that provide access to the three runways. No new taxiways are needed to serve the main building area.

The south-side building area is provided access to the runways via Taxiway A and the partial parallel Taxiway J. The planned extension of Taxiway J will provide a full-length parallel taxiway south of Runway 6-24. Completion of Taxiway J will provide convenient circulation to the airport's three runways.

There are two components to vehicular accessibility: access to the airport; and access to the airfield (e.g., hangars, FBOs). Access to the airport is a more significant issue. Currently the only way to access the airport is via Airport Road. Immediately beyond the airport's boundary an active rail line crosses Airport Road. There are times when access to the airport is blocked. Later in this chapter, a proposed site for a second access road is presented.

There are currently numerous points at which pilots and others can access the airfield. Access points range from ciphered gates, and manual swing gates, to ungated entries. Fencing types range from cattle fence to chain link (of various heights).

At a general aviation airport, the system of fencing and gates is intended to provide three functions:

- › Exclude stray domestic and wild animals (e.g., dogs and deer)
- › Prevent inadvertent entry of people and vehicles onto the airfield operations area

- › Increase the difficulty of determined entry by those with malicious intent (i.e., thieves).

There are general Federal Aviation Administration guidelines for fencing and gates. Additional direction is expected to be provided by the Transportation Security Agency.

It is desirable to have vehicle access that does not require visitors to enter the airfield for box hangars, particularly larger box hangars, and fixed base operators. Those needing to access smaller hangars, shade hangars, and tiedowns will typically have to enter the airfield operations area. Appropriate modifications to the existing airfield fencing and gate system are discussed later in this chapter.

- ▶ **Development Staging**—Another important factor in the preparation of a building area plan is the timing of future development. The object is to have a plan that is cost effective and flexible enough to respond to changes in the type and pace of facility demand. The plan must also make sense at each stage of development. Sometimes, the desired location for facilities in the short-term may conflict with the optimum long-range plan.

Recent and ongoing development has centered on meeting demand for aircraft storage. Private development has included a large, box hangar constructed by the full-service FBO, and several other large, box hangars constructed on leaseholds on the south side of the airport. The airport has facilitated this hangar development on the south side through the extension of a taxiway and taxilanes. The airport is in the process of completing construction of additional T-hangars in the main building area.

It is anticipated that there will be demand for a range of hangar sizes: shade hangars, T-hangars, small box hangars, and large box hangars. The design of the building areas will enable each size of hangar to be constructed independently; they do not require other development as a precursor to their implementation. Sites for accommodating the various types of demand are presented later in this chapter.

The timing of construction of additional aircraft storage hangars and fixed base operator facilities will be dependant upon demand. It is not proposed that any facilities be built speculatively. Additionally, it is recommended that the County not construct large box hangars or facilities for fixed base operators. These are typically much more likely to become vacant than small box hangars and T-hangars.

PRINCIPAL BUILDING AREA FEATURES

Based Aircraft Storage and Parking

The forecasts prepared as part of this master plan update indicate that demand will exist for storage facilities for up to 190 additional based aircraft by the year 2022. All of the future demand is contingent upon hangar availability. A need for additional tiedowns to accommodate based aircraft is not anticipated.

Hangars

As noted earlier, it is anticipated that demand for additional aircraft storage hangars will continue throughout the 20-year planning period. The continued availability of reasonably priced hangars is essential to growth at the airport. As many as 190 new hangar spaces may be needed by 2022.

The airport is actively taking steps to meet current demand. The County has recently completed construction of a 12-bay T-hangar building. Additionally, the County is developing leaseholds upon which hangars will be constructed using private funds. Additional development can be accommodated as follows.



A significant share of the demand for new hangars can be met in the main (east side) building area. The preliminary site plans prepared by Bridgeford Flying Service include sufficient hangar space to accommodate at least 5 large aircraft. Over 80 additional T-hangars or shade hangars could be constructed in the main building area. These units would utilize the remaining undeveloped areas in the southeast corner and portions of the existing (but largely unutilized) south tiedown apron. This would fully meet the demand for small hangars under the high forecast. If the south apron was not used for hangars, an additional 36 small hangars would need to be constructed in the south-side building area.



The balance of the demand for hangars (110 units) will need to be met in the south-side building area. The site plan developed for the Apex leasehold would accommodate about 25 large aircraft. At least an additional 15 aircraft could be housed in box hangars planned for the area east of the CHP facility. This leaves an unmet demand for 60 units that would need to be provided on the south-side hangar area. These units would be a mix of small box hangars (or large T-hangars) and larger box hangars. There is sufficient acreage available on the south side to accommodate this demand.

Based Tiedowns

Approximately a dozen based aircraft are tied down on the main apron. Several of these aircraft are operated by the full-service FBO. It is anticipated that these aircraft can remain on the main apron through the 20-year planning period. Assuming that the full-service FBO expands as currently planned, only a few other based aircraft will continue to need tiedowns. If transient demand exceeds forecasted levels, sufficient space will continue to exist on the south apron to accommodate them.

Transient Aircraft Parking

Peak demand, in this context, means a regularly occurring peak demand. Annually, there will be 2 or 3 days when demand is higher than the peak demand. Parking demand on these extraordinary peak days should continue to be accommodated through the various operational measures that the airport staff have devised.

As noted in Chapter 2, peak transient aircraft parking demand is forecast to increase from 27 aircraft to 44 aircraft over the next 20 years. During this period, the share of large aircraft is expected to continue to increase. Although the main apron is large enough to accommodate this demand, its present layout is not well suited to serving large aircraft. A key factor is that the area on the apron with the highest pavement strength is the section furthest from the full-service FBO.

Alternative designs for the transient apron were developed to meet these key criteria:

- ▶ The layout of parking spaces should accommodate the full range of aircraft sizes, from single-engine piston aircraft to large business jets.
- ▶ Parking for large aircraft should be as close as practical to the full-service FBO as their crews and passengers are most likely to use its services.
- ▶ Parking for the largest aircraft should be close to the apron's central taxiway. This minimizes the amount of the apron that will be allocated to taxiways with the large setbacks required to accommodate these aircraft.
- ▶ Parking for the smallest aircraft should be sited to minimize the potential for upset from jet blast.
- ▶ The layout should maximize the number of aircraft that can be accommodated on the apron.

The main apron can be generally oriented with the rows in a north-south or east-west direction. One alternative was developed for each orientation to permit comparison. Alternative 1 (Figure 4A) presents an apron layout with an east-west orientation. Under this alternative, parking positions for the largest aircraft is directly from the central

taxilane. Parking positions for multi-engine aircraft are located on both sides of the central taxilane. Tiedowns for small aircraft are located on the north side, near the fueling island. Eight taxilanes connect the apron to Taxiway A. This alternative would accommodate 61 aircraft.

Under the second alternative (Figure 4B), a north-south orientation is used. In this alternative, the largest aircraft would be parked in a row facing the full-service FBO. Parking positions for multiengine aircraft are located west of the large aircraft positions and on the north half of the main apron. Tiedowns for smaller aircraft are located in the northwest corner of the apron. Two T-hangars would be eliminated to provide space for a taxilane at the southern end of the apron. Only three taxilanes connect the apron to Taxiway A; one of these is a short bypass taxilane serving the small aircraft tiedown positions. This alternative would accommodate 51 aircraft.

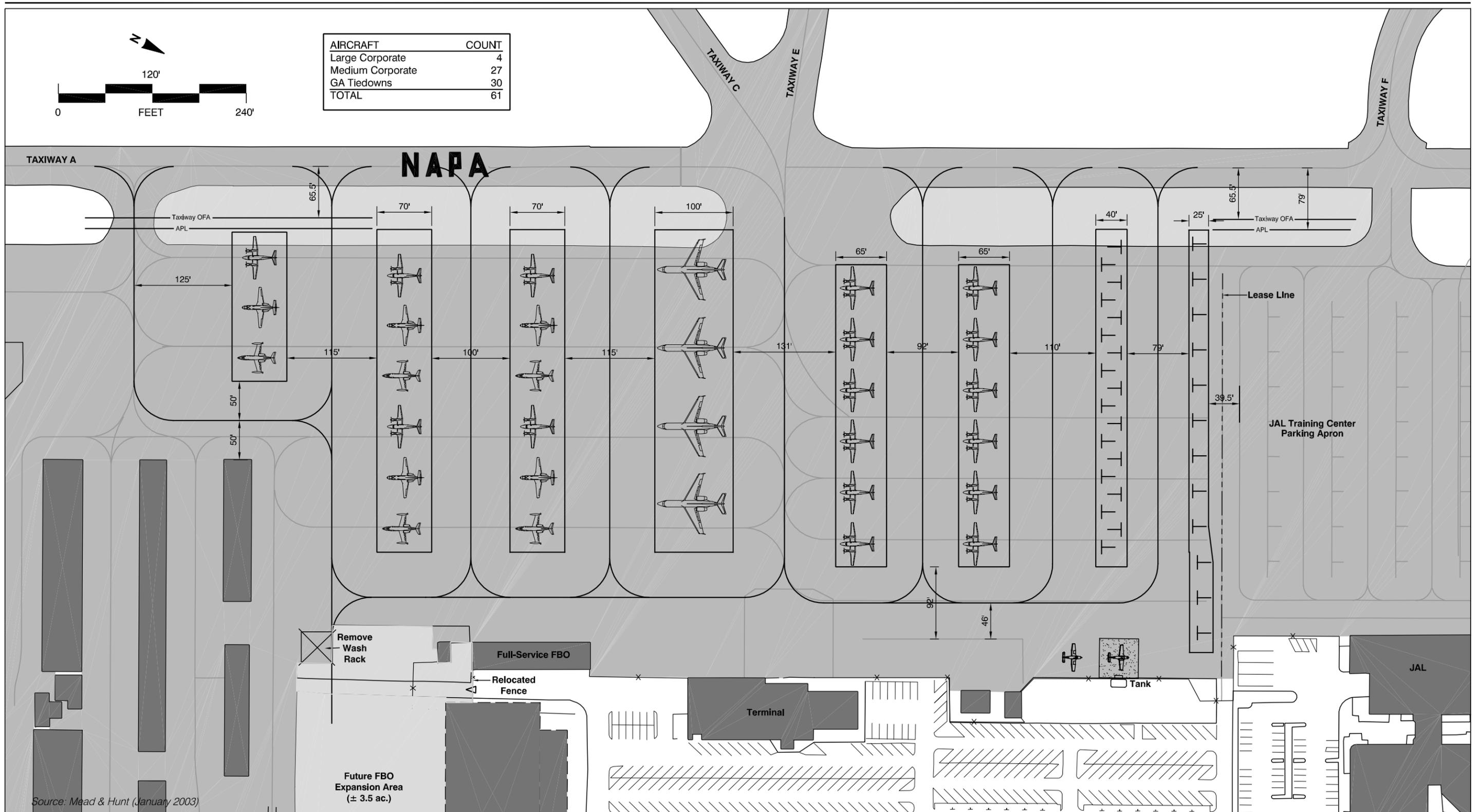
Alternative 1 (Figure 4A) has been selected for adoption. This alternative provides almost 20% more capacity than Alternative 2. Alternative 1 has superior circulation. It also provides more conveniently sited tiedowns for small aircraft.

Short-Term Transient Parking

Some of the aircraft remain on the transient apron only long enough to offload passengers. Providing a place to quickly disembark passengers close to the terminal and full-service FBO would:

- ▶ Be more convenient for those passengers
- ▶ Improve safety by reducing or eliminating the need for vehicles to enter the airfield operations area
- ▶ Improve security by having these activities more readily viewable by FBO and airport staff

It is recommended that a short-term parking box be painted on the apron edge taxilane that is proposed to extend in front of the terminal and full-service FBO (Figure 4A). This location would result in the apron edge taxilane being blocked for short periods. However, as there would be eight taxilanes connecting directly to Taxiway A, this would not adversely affect circulation to a significant degree. A dedicated short-term parking position would be preferred. However, the geometry of the apron would require elimination of one or more parking positions to create a dedicated short-term parking position.



Source: Mead & Hunt (January 2003)

Figure 4A

Transient Apron - Alternative 1
 Napa County Airport

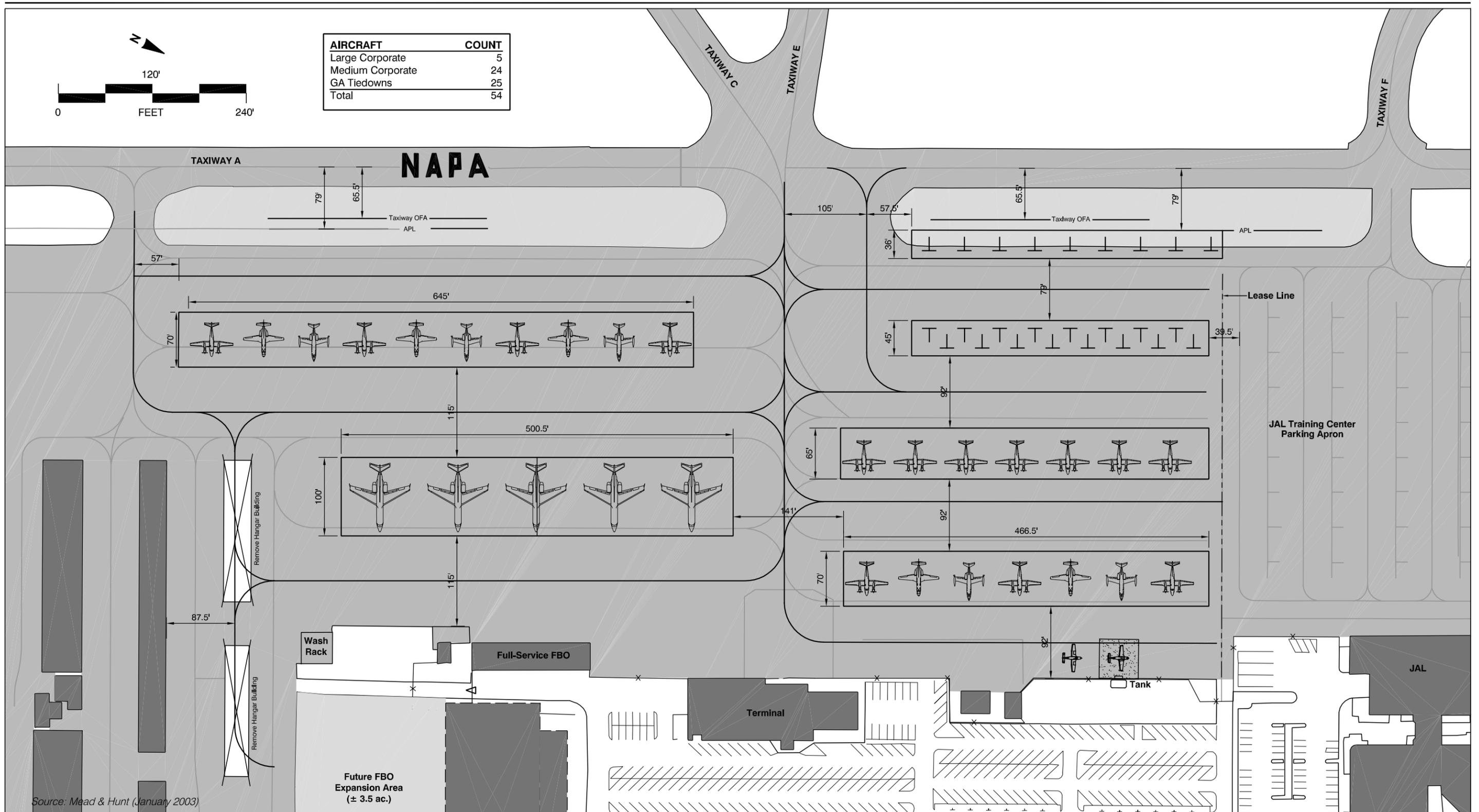


Figure 4B

Transient Apron - Alternative 2
 Napa County Airport

Fixed Base Operations

It is anticipated that there will be additional demand for leaseholds for fixed base operations (FBOs) during the 20-year life of this plan. Most of this demand will be for specialty FBOs offering only a limited number of services. There is the potential that there would be sufficient activity to support a second full-service FBO by the end of the planning period. However, the potential viability of a second full-service FBO will be depending upon both airport-specific and national economic factors. The most likely scenario is for existing FBOs to expand facilities and services, while a few additional specialty FBOs are also established on the airport.

Although developable land remains available in the main building area, none of the available sites are well suited to use as an FBO. The available sites lack the required combination of visibility from the airfield side, and direct access from the landside. However, there is the potential to expand the facilities of the existing FBOs. The full-service FBO has plans for expansion of its facilities on a parcel adjacent to its existing offices in the main building area. The staff at IASCO has discussed the potential for adding to the services to those that they currently provide.

New FBOs will need to either become a subtenant to an existing FBO or establish new leaseholds on the south-side building area. Leaseholds will typically need to be a least one-half acre, but could be several acres. Due to the high variability in size requirements, specific leaseholds are not shown on the building area plan. General site requirements for specialty FBOs are similar to those of larger box hangars:

- ▶ Street access for delivery trucks and other visitors that does not require entering the airfield operations area
- ▶ Paved parking lots and delivery areas
- ▶ Fencing and gates to meet security requirements
- ▶ Sufficient space on the leasehold for staging and parking aircraft
- ▶ Landscaping to enhance the appearance of the facility

General Aviation Terminal

As noted in Chapter 1, the existing general aviation terminal includes offices for airport staff and Bridgeford Flying Services, a pilots' shop, a conference room, and a restaurant. The building is slightly more

than 14,500 square feet in size. Table 4A shows the current allocation of space in this building.

The age and layout of the terminal building is increasingly becoming a constraint. The layout makes it impractical to fully meet Americans with Disabilities Act requirements. Maintenance costs have risen and are taking an increasing share of staff time. Additionally, the facility makes a poor visual impression as a gateway to the internationally known Napa Valley. The terminal's appearance should be consistent with the commitment to design excellence that is part of the Napa Valley experience. It is recommended that the facility be replaced. The timing will depend upon funding; the terminal should be replaced as soon as practical.

Development of a programmatic plan for a new terminal is beyond the scope of this master plan. However, certain components seem likely to be included in a new terminal:

- ▶ A restaurant with clear views of the airfield
- ▶ Offices for airport staff
- ▶ A gift shop with items linked to Napa Valley themes and basic pilot supplies
- ▶ A least one meeting room for airport-related functions (e.g., Airport Advisory Commission meetings)
- ▶ Basic amenities for travelers (i.e., restrooms and telephones) that are available 24 hours a day

Other elements of the terminal are less certain and will require analysis prior to design of the facility:

- ▶ Will the facility include offices or counter space for FBOs?
- ▶ Will the facility include a formal flight-planning center?
- ▶ Will the building be one or two stories?
- ▶ Will the meeting room(s) be sized to support use for community meetings?
- ▶ Will maintenance and operations equipment and supplies be housed in the terminal or a separate building?
- ▶ What security requirements will apply?

Allocation of Space

FUNCTION	SQUARE FEET	PERCENTAGE OF SPACE
Restaurant		
Subtotal	9,077	62.3%
Common Area		
Lobby	1,765	12.1%
Hallway	414	2.8%
Restroom	796	5.5%
Telephones	41	0.3%
Storage	121	0.8%
Subtotal	3,137	21.5%
County		
Lecture Room	425	2.9%
Office	561	3.9%
Subtotal	986	6.8%
Bridgeford Flying Service		
Office	785	5.4%
Gift Shop	584	4.0%
Subtotal	1,369	9.4%
Total	14,569	100.0%

Note: Square footages provide for each function are estimated.

Source: Data compiled by Shutt Moen Associates (May 2002)

Table 4A

Terminal Area Allocation
Napa County Airport

Until a programmatic plan is developed for the new terminal, an accurate estimate of its required size cannot be made. Depending upon the range of functions contained in the new terminal, the size could vary considerably. For facility planning purposes, a building envelope of 40,000 square feet has been placed in the building area plan. It is anticipated that the new terminal could be contained within this space. For budgeting purposes, it is presumed that the new terminal will be a 30,000 square foot, single-story structure.

The issue of how existing terminal activities will function during construction of a new terminal is beyond the scope of this plan. The fact that the building envelope for the new terminal overlaps the existing terminal should not be interpreted to mean that some or all of the existing terminal will need to be demolished prior to construction of the new terminal. This important issue will be addressed as part of the programmatic plan for the new terminal. In any case, it is anticipated that construction activities will be able to be staged to minimize disruption of existing activities.

The terminal building will serve as a gateway for visitors and a point of focus for area residents wishing to view aviation activities. To fulfill this role, the new terminal will need to be located in the same general location as the existing terminal. The new terminal will retain the existing spatial relationships with other components in the main building area:

- ▶ Immediately adjacent to the transient apron
- ▶ Near the full-service FBO
- ▶ Served by an at-grade parking lot
- ▶ Adjacent to the main entrance road for the airport

SUPPORTING FACILITIES

Aircraft Fuel Storage and Dispensing

Both low-lead Avgas and Jet A fuel are currently provided at Napa County Airport. Dispensing of Jet A fuel is from trucks only. Dispensing of Avgas is by both trucks and a Self-Fueling Facility. The fuel farm that supplies the trucks is owned by Napa County and is located in the northeast corner of the airfield adjacent to the railroad tracks. The fuel farm is adequately sized to continue to serve truck fueling.

The self-fueling facility is available 24 hours per day by credit card. Interest in the self-fueling facility is partially driven by the fuel price being slightly lower than that for truck-delivered fuel.

Optimum Self-Fueling Facility Site

The self-fueling facility serves both based and transient aircraft. Alternative sites were evaluated based upon the following criteria:

- ▶ **Visibility**—Because this fueling facility will be open 24 hours a day, it is essential that the facility be readily visible to visiting pilots.
- ▶ **Maneuverability**—Aircraft should be able to move to and from the facility with ease and with minimal conflict with aircraft in queue, other parked aircraft, and aircraft ground operations.
- ▶ **Servicing**—Fuel trucks should be able to access tanks without conflicting with aircraft or vehicles.
- ▶ **Expandability**—It should be possible to expand the facility to provide larger tanks or add Jet A.
- ▶ **Minimize impact on aircraft parking capacity**—Retain the maximum amount of apron for aircraft parking.
- ▶ **Avoid conflicts with future airport development**—The site should avoid planned development and minimize development impediments.

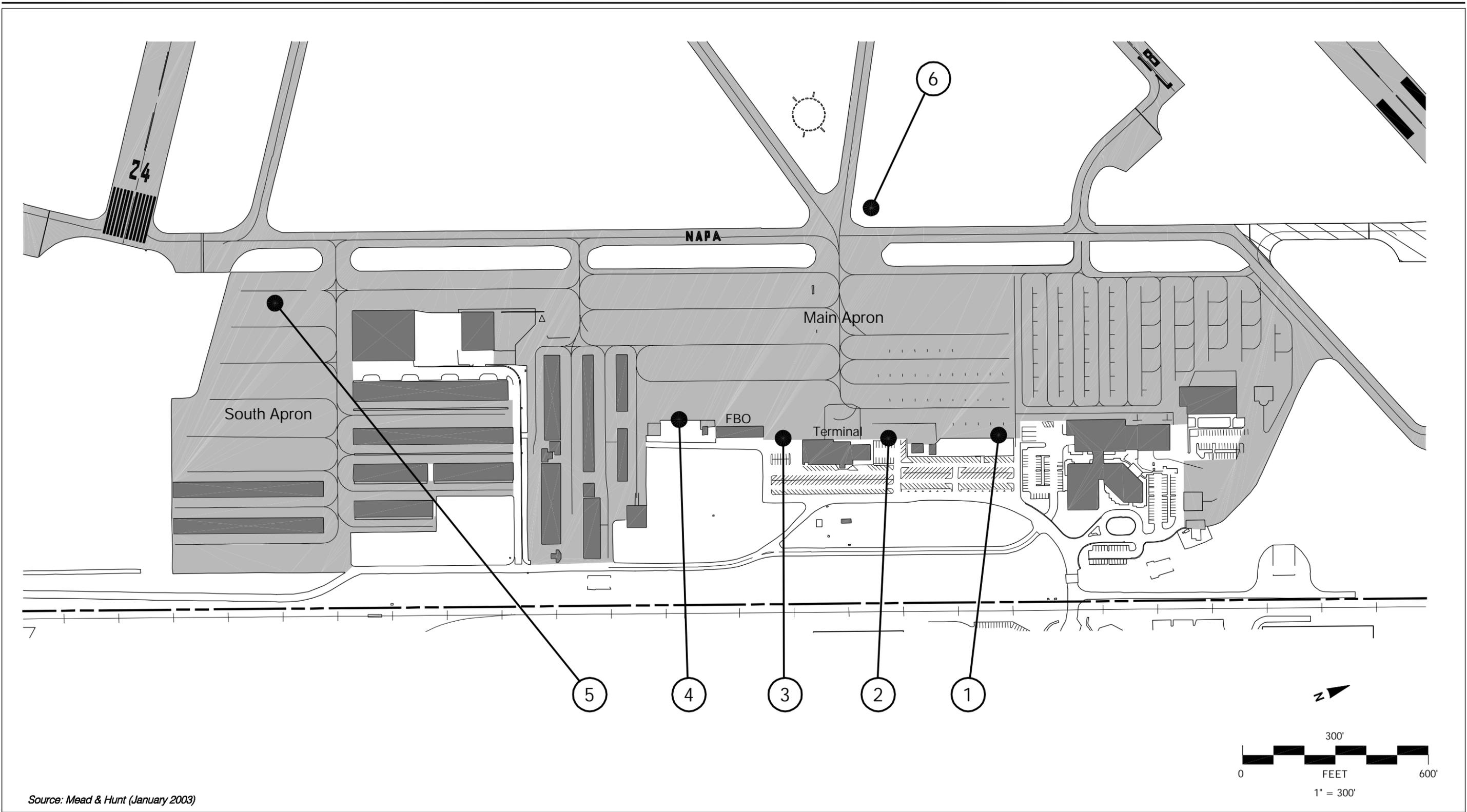
Six potential sites were evaluated (Figure 4C). Siting the fueling facility on a freestanding island in the apron was rejected because of potential impacts to circulation and loss of parking capacity. The results of the analysis are presented in Table 4B. Based upon this analysis, Site 1 (located in the northeast corner of the main apron) was selected. This site had the least effect on apron circulation and the simplest access for fuel trucks.

Aircraft Wash Racks

Wash Rack – An area designed for washing aircraft. Typically, wash racks are designed for small aircraft. Large aircraft are commonly washed in their hangar. A wash rack normally consists of a Portland cement pad with an adjacent water source. Wash water is collected and filtered prior to entry into a sewage collection line or septic system.

The airport currently has two public use wash racks. One public wash rack is located at the southeast corner of the main apron. This facility falls within an area that will become part of a taxilane when Bridgeford Flying Service expands their leasehold to the southeast. Therefore, a new site was needed.

A replacement site needed to be located close to where aircraft are based. It needed to be easy to access for both aircraft and vehicles (washing materials are often carried to the site in the owner's vehicle). To minimize potential conflicts, the site needed to be located away from taxiways and service roads where aircraft and vehicles may be moving rapidly. Ideally, the site needed to also be close to a domestic water supply.



Source: Mead & Hunt (January 2003)

Figure 4C

Potential Self-Serve Fueling Sites
Napa County Airport

SITE / LOCATION	PROS	CONS
1. NE corner of main apron	<ul style="list-style-type: none"> › Highly visible from apron entrance › Located where a transient pilot would expect it › Minimizes congestions in apron's central taxilane › Fuel delivery trucks do not enter airfield › Little potential effect on terminal area development 	<ul style="list-style-type: none"> › Eliminates 6 potential tiedowns › Not well sited for future introduction of Jet A › Only a linear queue is possible which limits capacity
2. North of terminal	<ul style="list-style-type: none"> › Highly visible from apron entrance › Located where a transient pilot would expect it › Fuel delivery trucks do not enter airfield › Reasonable location to provide Jet A 	<ul style="list-style-type: none"> › Would eliminate airport staff parking lot › Close to apron's central taxilane, will contribute to congestion › Likely to conflict with new terminal siting › Only a linear queue is possible which limits capacity
3. Between terminal and FBO	<ul style="list-style-type: none"> › Highly visible from apron entrance › Located where a transient pilot would expect it › Fuel delivery trucks do not enter airfield › Reasonable location to provide Jet A 	<ul style="list-style-type: none"> › Close to apron's central taxilane, will contribute to congestion › Likely to conflict with new terminal siting › Only a linear queue is possible which limits capacity
4. South of FBO	<ul style="list-style-type: none"> › Highly visible from apron entrance › Located where a transient pilot would expect it › Fuel delivery trucks do not enter airfield › Reasonable location to provide Jet A 	<ul style="list-style-type: none"> › Would conflict with FBO expansion plans › Only a linear queue is possible which limits capacity
5. South Apron	<ul style="list-style-type: none"> › Well sited to serve based aircraft › Allows fueling on two sides which increases capacity 	<ul style="list-style-type: none"> › Not readily visible from apron entrance › Not located where a transient would expect it › Fuel delivery trucks must enter airfield
6. West of Taxiway "A"	<ul style="list-style-type: none"> › Highly visible › Reasonable location to provide Jet A › Does not contribute to apron congestion › Allows fueling on two sides which increases capacity 	<ul style="list-style-type: none"> › Located within aircraft movement area, will complicate air traffic control › Fuel delivery trucks must cross main apron and Taxiway A: congestion and safety concerns

Table 4B

Comparison of Potential Self-Fueling Facility Sites Napa County Airport

The recently constructed wash rack is adjacent to the taxiway that serves the southernmost rows of hangars in the main (i.e., eastside) building area. This location is readily accessible by the based aircraft on the main building area. However, being at the end of primary taxiway, the site is not exposed to high volumes of taxiing aircraft.

As the southern building area grows, it will be appropriate to develop a wash rack to serve the based aircraft in this area. The wash rack should be collocated with the first group of hangars for small aircraft (i.e., shade hangars, T-hangars or small box hangars). A possible site is shown on the building area plan. However, the associated hangar layout is merely conceptual; the actual layout will depend upon demand.

Fencing and Gates

Events of the past few years have dramatically increased public and agency concerns over aviation security. Although most attention is focused on airports with scheduled passenger service, all airports can expect security requirements to be increased. New guidance for general aviation airports has not yet been released.

However, at general aviation airports such as Napa County Airport, it is likely that the physical requirements for increased security will focus on controlling entry to the airfield.

Cipher Gate: A gate equipped with a lock that is opened with a code. Ciphered vehicle gates commonly have an electronic pad into which the codes can be entered. Pedestrian gates can either have an electronic pad or mechanically operated buttons built into the lock.

The airport perimeter is completely fenced. Fencing is a mixture of chain link, though the building area, and cattle fencing in outlying areas. A number of ciphered gates that provide access to the main and south-side hangar areas have been installed. Vehicle access to the transient apron is via two automated gates. Pedestrian access to the transient apron is via a walk gate in front of the terminal building and two gates located north and south of the terminal building. With the exception of the walk gate in front of the terminal, all gates are ciphered.

It is likely that future guidance from the U.S. Transportation Security Agency or Federal Aviation Administration will seek to limit circumstances when gates providing access to an airfield are open and unmonitored. It is also appropriate to limit the distribution of cipher codes and electronic gate cards. This must be accomplished while permitting delivery trucks and visitors to access FBOs and larger hangars. The most efficient means of accomplishing this is to:

- ▶ Convert the south-side access road from an internal access road to a public road.

- ▶ Extend the existing fencing and gate system within the main and south-side building area to eliminate the remaining openings.
- ▶ Make appropriate physical and operational changes so that all gates are either:
 - › Automatic cipher- or card-operated vehicle gates
 - › Self-closing cipher- or card-operated pedestrian gates
 - › Padlocked, manually operated gates
- ▶ Make necessary modifications to fencing within the building areas to ensure that all fences are at least six feet in height.

Vehicle Access and Parking

Access

Vehicle access to the airport is provided by Airport Road via a bridge across Fagen Creek. Two concerns exist with this access. First, this single point of access is located immediately adjacent to an active rail line. The road can be closed for extended periods during passage of a freight train. This is both inconvenient and potentially hazardous should a fire or medical emergency occur while the road was blocked. The only solution to this is to provide an additional point of access.

A second issue is the narrowness of the bridge crossing Fagen Creek. It is too narrow to effectively serve as the main entrance to the Napa County Airport. The bridge should be replaced with one that functionally and esthetically serves as an entry to the airport. This will require providing a wider bridge to accommodate both vehicles and a bicycle lane. Additionally, the bridge design should harmonize with the streetscape in the adjacent industrial park.

A second point of access will need to enter the airport somewhere along its southern boundary. A second entry on the eastern or northern boundary would have to cross the same rail line that serves as a barrier to the existing road. The western boundary of the airport is a marsh.

It is not critical where the second point of access is along the southern boundary. This new access road will connect into the existing service road that runs along the southern property line. The point of access will not affect the placement or functionality of proposed airport facilities.

The nearest public road south of the airport is Green Island Road. At its nearest point, Green Island Road is about 3,400 feet from the southern airport access road. This distance will be reduced to approximately 1,500 feet when the property in the approach to Runway 36L is acquired. Potentially the least complicated and least expensive means of providing the needed access is to extend a road through the property planned to be acquired for approach protection. Additional property (either a right-of-way or fee simple) would then be acquired to connect the access road to Green Island Road.

Although the option described above is favored because the timing could be controlled by Napa County, another alternative may be feasible. None of the property immediately south of the airport is developed. It might be cost-effective to connect to Green Island Road through an adjacent property in the future. The viability of this option would depend upon how and when the adjacent properties develop.

Parking

Public parking is available in front of the terminal and in an adjacent lot to the north. Airport tenants are responsible for providing parking for their staff and visitors. The public parking lots provide sufficient capacity for current operations and near-term growth. Parking needs should be evaluated as part of the programming for the new terminal. It can be anticipated that the parking lots will need to be reconfigured when the new terminal is developed. Depending upon the mix of uses in the terminal, and its size, additional parking may need to be provided in the undeveloped area east of the existing parking lots.

Finance and Implementation

IMPLEMENTATION

The previous chapters have presented a plan for development of the airfield and terminal area at Napa County Airport. This chapter addresses how this plan might be implemented. The first section of this chapter summarizes the assumptions that underlie the recommendations contained in this plan. Next, the Capital Improvement Program is presented and funding sources available for its implementation are presented. In the latter part of this chapter, environmental concerns, particularly noise, will be addressed.

PLAN ASSUMPTIONS

There are numerous explicit and implicit assumptions that shaped the forecasts and designs presented in this plan. Future interpretation of this plan should consider these assumptions. If future conditions do not match these assumptions, the plan's recommendations should be reexamined. The key plan assumptions are listed in the sections that follow.

Community Context

- ▶ The adjacent industrial park will continue to develop with uses similar to those that have developed to date.
- ▶ Residential uses will not develop in the airport's environs.
- ▶ No closure of any nearby airports will occur.
- ▶ Appropriate land acquisition and land use decisions will be made to enable all airport operations to continue.
- ▶ The Napa Valley and adjacent areas will continue to support major cultural and sports events.
- ▶ The Highway 12-29 interchange will be improved during the life of this plan.

Airfield

- ▶ No further security mandates will be required from the Transportation Security Agency that will necessitate significant physical changes.
- ▶ JAL training operations will continue, although the volume of students may fluctuate.
- ▶ A precision instrument approach will be developed.

Transient Aircraft Use

- ▶ Transient operations by turboprops and jets will increase due to expansion of cultural events and links with new businesses in the area.
- ▶ Jets up to the size of the Gulfstream V will be regular users of the airport.
- ▶ Use by helicopters will be limited, except during major local recreational (e.g., raceway) and cultural events.

Implementation

- ▶ Funding from the FAA will continue through the planning period.
- ▶ Airport development will be shaped by environmental constraints, but will be implemented as scheduled.

CAPITAL IMPROVEMENT PROGRAM

The proposed 20-year Capital Improvement Program for Napa County Airport is set forth in Table 5A. The listed projects include both proposed improvements, as described in previous chapters, and recommended major maintenance work for the airfield and building area pavement. The total investment over the next 20 years would be approximately \$48 Million. Required matching funds would total about \$43 Million. If full state participation occurs, Napa County's contribution would be a bit over \$2.6 Million.

The project costs listed in the Capital Improvement Program represent order-of-magnitude estimates in 2003-dollar values and include design engineering and other related costs and contingencies. The estimates are intended only for preliminary planning and programming purposes. More detailed engineering design and, in some cases, market analyses should be performed before proceeding with the projects. It should also be noted that the cost estimates for creating standard safety areas for Runway 6 and Runway 36R are **very approximate**; hydrologic data, soils information, and detailed topographic mapping are not available for the areas to be filled and graded. These safety area cost estimates are an order of magnitude less precise than those of other capital projects. Additionally, as costs for environmental mitigation are not known, they are not included in this CIP.

CAPITAL FUNDING SOURCES

There are a variety of resources from which funding and financing for general aviation airport facilities and improvements can be obtained. These resources include federal grants, bonds, airport sponsor self-funding, and private investment.

Federal Aviation Grants

Currently, the most common source of federal aid for airport facilities is the Airport Improvement Program (AIP) administered by the FAA. Reauthorized in 2000, the current AIP is the latest evolution of a funding program originally authorized by Congress in 1946 as the Federal Aid to Airports Program (FAAP). The current authorization will expire at the end of the 2003 fiscal year. Current indications are that the program will be refunded with only minor changes in funding level and conditions.

	Estimated Costs (in 2003 dollars)			
	Total	Federal	State	County
Short-Range Projects (within 5 Years)				
1. Runway 18R-36L Joint Repair & 3" Overlay/Seal Coat	\$2,000,000	\$1,800,000	\$90,000	\$110,000
2. Runway 6-24 Joint Repair & 4" Overlay	\$1,850,000	\$1,665,000	\$83,250	\$101,750
3. Perimeter Fencing (Phase II)	\$1,250,000	\$1,125,000	\$56,250	\$68,750
4. Taxiway "K" Pulverize and Rebuild	\$1,200,000	\$1,080,000	\$54,000	\$66,000
5. Taxiway "C" Pulverize and Rebuild	\$1,100,000	\$990,000	\$49,500	\$60,500
6. Land Purchase- Borges	\$1,050,000	\$945,000	\$47,250	\$57,750
7. Terminal Design	\$1,000,000	\$900,000	\$45,000	\$55,000
8. Land Purchase - Clear Zone 18R	\$1,000,000	\$900,000	\$45,000	\$55,000
9. Runway 18L-36R Extension	\$950,000	\$855,000	\$42,750	\$52,250
10. Glide scope	\$800,000	\$720,000	\$36,000	\$44,000
11. Perimeter Fencing (Phase I)	\$580,000	\$522,000	\$26,100	\$31,900
12. Grading between old and new Hangars	\$500,000	\$450,000	\$22,500	\$27,500
13. Taxiway "A" Joint Repair & 4" Overlay	\$460,000	\$414,000	\$20,700	\$25,300
14. Taxiway "E" Pulverize & Rebuild/Seal Coat (portion)	\$300,000	\$270,000	\$13,500	\$16,500
15. Master Plan - Environmental Assessment	\$270,000	\$243,000	\$12,150	\$14,850
16. Runway 18L-36R Seal Coat	\$170,000	\$153,000	\$7,650	\$9,350
17. Wash Rack	\$120,000	\$108,000	\$5,400	\$6,600
18. Taxiway "B" Pulverize and Rebuild	\$100,000	\$90,000	\$4,500	\$5,500
19. Redesign Parking Area- FAA Tower Base	\$100,000	\$90,000	\$4,500	\$5,500
20. Taxiway "J" Seal Coat	\$30,000	\$27,000	\$1,350	\$1,650
21. Taxiway "F" Seal Coat	\$10,000	\$9,000	\$450	\$550
22. Taxiway "D" Seal Coat	\$7,000	\$6,300	\$315	\$385
Subtotal	\$14,847,000	\$13,362,300	\$668,115	\$816,585
Mid-Range Projects (approximately 5 to 10 Years)				
1. Construct Runway 6 Safety Area	\$3,250,000	\$2,925,000	\$146,250	\$178,750
2. East Central Apron Pulverize and Rebuild	\$2,750,000	\$2,475,000	\$123,750	\$151,250
3. Construct Runway 36L Safety Area	\$2,500,000	\$2,250,000	\$112,500	\$137,500
4. Taxiway "J" and "C" Extension	\$1,400,000	\$1,260,000	\$63,000	\$77,000
5. Airport Access - Fagan Bridge	\$200,000	\$180,000	\$9,000	\$11,000
6. Runway 18L-36R Extension	\$450,000	\$405,000	\$20,250	\$24,750
7. Taxiway "K" Runup Apron Expansion	\$350,000	\$315,000	\$15,750	\$19,250
8. Runway 18R-36L Seal Coat	\$200,000	\$180,000	\$9,000	\$11,000
9. East Apron Seal Coat	\$190,000	\$171,000	\$8,550	\$10,450
10. Runway 6-24 Seal Coat	\$175,000	\$157,500	\$7,875	\$9,625
11. Taxiway "E" Pulverize, Rebuild & Seal Coat	\$150,000	\$135,000	\$6,750	\$8,250
12. Removal of Abandoned Taxiway	\$100,000	\$90,000	\$4,500	\$5,500

Table 5A

Capital Improvement Program

Note: List of projects has not been updated to reflect the current ACIP. This will occur prior to the public hearing.

Mid-Range Projects (approximately 5 to 10 Years) continued				
13. West Central Apron Seal Coat	\$75,000	\$67,500	\$3,375	\$4,125
14. Taxiway "H" Seal Coat	\$65,000	\$58,500	\$2,925	\$3,575
15. Runway 18L-36R Seal Coat	\$45,000	\$40,500	\$2,025	\$2,475
16. Taxiway "A" Seal Coat	\$45,000	\$40,500	\$2,025	\$2,475
17. Taxiway "C" Seal Coat	\$35,000	\$31,500	\$1,575	\$1,925
18. Taxiway "K" Seal Coat	\$35,000	\$31,500	\$1,575	\$1,925
19. Taxiway "J" Seal Coat	\$30,000	\$27,000	\$1,350	\$1,650
20. Taxiway "F" Seal Coat	\$10,000	\$9,000	\$450	\$550
21. Taxiway "D" Seal Coat	\$7,000	\$6,300	\$315	\$385
22. Taxiway "B" Seal Coat	\$3,000	\$2,700	\$135	\$165
Subtotal	\$12,065,000	\$10,858,500	\$542,925	\$663,575
Long-Range Projects (10 to 20 Years)				
1. New General Aviation Terminal (30,000 sq ft)	\$6,000,000	\$5,400,000	\$270,000	\$330,000
2. East Apron Pulverize & Rebuild	\$4,650,000	\$4,185,000	\$209,250	\$255,750
3. Reconstruction of Tower Road	\$2,250,000	\$2,025,000	\$101,250	\$123,750
4. West Central Apron Pulverize and Rebuild	\$2,150,000	\$1,935,000	\$96,750	\$118,250
5. Taxiway "H" Recycle & 2" Overlay	\$2,000,000	\$1,800,000	\$90,000	\$110,000
6. Creation of Second Access Road	\$1,850,000	\$1,665,000	\$83,250	\$101,750
7. Runway 18R-36L Recycle, Overlay & Seal Coat	\$400,000	\$360,000	\$18,000	\$22,000
8. Runway 18L-36R Seal Coat	\$375,000	\$337,500	\$16,875	\$20,625
9. Taxiway "K" Expansion	\$375,000	\$337,500	\$16,875	\$20,625
10. Runway 6-24 Seal Coat	\$175,000	\$157,500	\$7,875	\$9,625
11. Taxiway "E" Seal Coat	\$150,000	\$135,000	\$6,750	\$8,250
12. Removal of Abandoned Taxiway	\$100,000	\$90,000	\$4,500	\$5,500
13. East Central Apron Seal Coat	\$100,000	\$90,000	\$4,500	\$5,500
14. East Central Apron Seal Coat	\$100,000	\$90,000	\$4,500	\$5,500
15. West Central Apron Seal Coat	\$75,000	\$67,500	\$3,375	\$4,125
16. Taxiway "H" Seal Coat	\$65,000	\$58,500	\$2,925	\$3,575
17. Taxiway "A" Seal Coat	\$45,000	\$40,500	\$2,025	\$2,475
18. Taxiway "C" Seal Coat	\$35,000	\$31,500	\$1,575	\$1,925
19. Taxiway "K" Seal Coat	\$35,000	\$31,500	\$1,575	\$1,925
20. Taxiway "J" Seal Coat	\$30,000	\$27,000	\$1,350	\$1,650
21. Taxiway "F" Seal Coat	\$10,000	\$9,000	\$450	\$550
22. Taxiway "D" Seal Coat	\$7,000	\$6,300	\$315	\$385
23. Taxiway "B" Seal Coat	\$3,000	\$2,700	\$135	\$165
Subtotal	\$20,980,000	\$18,882,000	\$944,100	\$1,153,900
Grand Total	\$47,892,000	\$43,102,800	\$2,155,140	\$2,634,060

Table 5A, continued

Capital Improvement Program

The AIP is based upon a user trust fund concept, allocating aviation-generated tax revenues for specified airport facilities on a local matching share basis. The program currently provides for 90% federal participation and 10% local participation on eligible airport projects in California.

Under the AIP, there are both *entitlement* and *discretionary* grants. There are two types of entitlement grants in the current program. General aviation airports can qualify for up to \$150,000 annual entitlement. Commercial service airports in the “Primary” category qualify for large entitlement grants based upon the volume of passengers enplaned at the airport in the prior year. Discretionary grants are awarded on a competitive basis, based upon need. As a general aviation airport, Napa County airport qualifies for the \$150,000 annual entitlement and discretionary funding.

State Aviation Grants

The State of California operates a grant program similar in concept to the Federal AIP program. All grants are awarded on a competitive basis. Grants are judged using a numerical weighting scheme. As with the Federal program, priority is given to projects that enhance safety. Due to the state’s financial crisis, new grants are not currently (July 2003) being awarded. However, the program has not been cancelled, and grants are expected to be awarded once the state’s financial situation makes this feasible.

State Annual Grant

Most general aviation airports in California are eligible to receive a \$10,000 annual grant from the State. These funds can be used for airfield maintenance and construction projects, as well as airfield and land use compatibility planning. Airports designated as *relievers* by the FAA are not eligible for this grant. Napa County Airport is a designated reliever airport and is, therefore, not eligible to receive this grant.

State Loan Program

The Caltrans Division of Aeronautics also administers a revolving loan program. Loans are available to provide funds to match AIP grants or develop revenue-producing facilities (e.g., aircraft storage hangars).

Other Grant Programs

Airport projects can also sometimes qualify for grant funding from nonaviation sources. Although not commonly available, airports have received grants from a variety of federal and state programs, including: economic development, community development, and rural infrastructure.

Bonds

Bond funds are a potential source of revenue to support development of larger projects. Given the high underwriting costs and relatively small size of most of Napa's projects, it is not anticipated that bonds would be used. However, it may be possible to participate in bonds being issued by Napa County or a regional agency. It is more likely that bond funds would be used to construct revenue-producing facilities, such as hangars. A new terminal building is also a plausible candidate for bond funding.

Airport Sponsor Self-Funding

At general aviation airports the size and character of Napa County, airport sponsor self-funding is principally provided by a combination of airport-generated income and retained earnings. These funds are often used to finance airport improvements that are not grant eligible, and the local matching share for grants-in-aid. Use of this source is the simplest, and often most economical method, because direct interest costs are eliminated.

Private Investment

Private sector investment is an important source of funding for some types of airport improvements. At Napa County Airport, private funding is most likely to be used to construct larger aircraft storage hangars and fixed base operator facilities.

The most common sources of funding for private sector development are commercial lending institutions and insurance companies. In the case of private development on public lands, these types of financing may be difficult and expensive to obtain because the borrower can encumber only the improvements as loan collateral. It is essential that agreements be reached with the tenants that provide for adequate airport revenues and facility development, while encouraging private investment and satisfying tenants' borrowing requirements. Specifically, the lease term should be sufficient to allow reasonable investment amortization over the period of the agreement.

Those capital expenditures that are most appropriately constructed with private funds have been excluded from the list of proposed capital projects identified in the *Master Plan* (see Table 5A).

ENVIRONMENTAL CONSTRAINTS

Development projects for Napa County Airport will occur within the regulatory structure of the State of California and the United States federal government. Both levels of government have environmental regulations that must be considered. This section is intended to identify potential constraints to implementation of the project identified in this plan. Only those factors that might potentially limit proposed development are presented.

Biological

An analysis of potential biological constraints was prepared in August 2002 specifically for the *Airport Master Plan Update* for Napa County Airport. The complete document is included as Appendix F. This analysis included both fieldwork and review of published data. Based upon this research, the following conclusions can be drawn:

- ▶ Wetlands and other waters of the United States may be present in areas that would be affected by development proposed in this plan. The extension of Runway 18L-36R, Taxiway J, and development of the south side of the airfield are all potentially affected. Wetland delineations will need to be conducted to determine if the low areas meet the formal criteria defined in the Clean Water Act.
- ▶ Potential habitat exists on the airport for several rare plants known to exist in the vicinity. Focused field surveys should be conducted to determine if any of the following plants exist in areas that would be affected by proposed airport development:
 - › Suisun March aster (*Aster lentus*)
 - › Soft bird's-beak (*Cordylanthus mollis* ssp *pusilla*)
 - › Contra Costa goldfields (*Lasthenia conjugens*)
 - › Delta tule pea (*Lathyrus jepsonii* var. *jepsonii*)
 - › Legenere (*Legenere limosa*)
 - › Mason's lilaeopsis (*Lilaeopsis masonii*)
 - › Marin knotweed (*Polygonum marinense*)
- ▶ The airport also contains potential habitat for a number of rare animals. A few of these animals were observed during the field investigation. Others would only be present during other seasons. Focused field studies should be performed to determine

if any of the following animals are present in areas expected to subject to development:

- › Vernal pool fairy shrimp (*Branchinecta lynchi*)
 - › California red-legged frog (*Rana aurora draytonii*)
 - › Western pond turtle (*Clemmys marmorata*)
 - › Northern harrier (*Circus cyaneus*)
 - › California black rail (*Laterallus jamaicensis coturniculus*)
 - › Burrowing owl (*Athene cunicularia*)
 - › Short-eared owl (*Asio flammeus*)
 - › California horned lark (*Eremophila alpestris actia*)
 - › San Francisco common yellowthroat (*Geothlypis trichas sinuosa*)
 - › Tricolored blackbird (*Agelaius tricolor*)
 - › Suisun shrew (*Sorex ornatus sinuosis*)
 - › Pallid bat (*Antrozous pallidus*)
- ▶ The airport also appears to contain a small section of Coastal Brackish Marsh in its southwestern corner. This type of habitat has been identified by California Department of Fish and Game as a sensitive plant community/habitat.

Noise Effects

Integrated Noise Model Inputs

- › The number of operations by aircraft type or group.
- › The distribution of operations by time of day for each aircraft type.
- › The average takeoff profile and standard approach slope used by each aircraft type.
- › The amount of noise transmitted by each aircraft type, measured at various distances from the aircraft.
- › The runway system configuration and runway lengths.
- › Runway utilization distribution by aircraft type and time of day.
- › The geometry of common aircraft flight tracks.
- › The distribution of operations for each flight track.

Noise is often described as unwanted or disruptive sound. Because of its routine, everyday occurrence, it is usually perceived as the most significant adverse impact of airport activity. This section will evaluate the noise effects of implementation of the master plan.

A pure sound is measured in terms of: its magnitude, (often thought of as loudness) as indicated on the decibel (dB) scale; its frequency, (or tonal quality) measured in cycles per second (hertz); and its duration, or length of time over which it occurs. To measure the noise value of a sound or series of sounds, other factors must also be considered. Airport noise is particularly complex to measure because of the widely varying characteristics of the individual sound events and the intermittent nature of these events' occurrence.

In an attempt to provide a single measure of airport noise impacts, various cumulative noise level metrics have been devised. The metric most commonly used in California is the Community Noise Equivalent Level (CNEL). This measure is similar to the Day-Night Average Sound Level (DNL or L_{dn}) metric used elsewhere in the United States. The results of CNEL calculations are normally depicted by a series of contours representing points of equal noise exposure in 5 dB increments. Key factors involved in calculation CNEL contours are noted to the left.

Precision of noise contours: As with all modeling, there are inherent limitations to the precision of noise contours prepared using the Integrated Noise Model program. On average, the model is only accurate within about 3 decibels. The location of contour boundaries for lower noise levels are less precise than higher noise levels contours. To a large degree this is because variability in pilot and aircraft performance becomes more pronounced further from the runways.

Noise contours were prepared using the FAA's Integrated Noise Model (Version 6.1). Both current and forecast operational levels were modeled. Figure 5A presents the noise contours for the current activity level. Noise contours for 2022 are presented in Figure 5B. These contours assume that Runway 18L-36R has been extended to 3,380 feet and the helipad constructed. Noise model inputs are presented in Appendix E.

Federal guidelines suggest that all land uses are acceptable outside of the 65 CNEL contour. However, this standard was established with major metropolitan areas in mind. With Napa County's lower ambient noise levels, it is appropriate to consider noise effects outside of the 65 CNEL contour. The *Airport Land Use Compatibility Plan (1991)* adopted by the Napa County Airport Land Use Commission (and revised in December 1999) sets a limit of 55 CNEL for most residential uses in the airport's environs. A 60 CNEL limit can be applied for residential uses where higher ambient noise levels exist (e.g., next to freeways).

Currently almost all of the 60 and 65 CNEL contours fall within airport property. The sole exception is a 200-foot segment of the 60 CNEL contour that extends past the railroad tracks northeast of the airfield. The 55 contours extend beyond airport property to the north, west and south. Fortunately, the land uses within the 55 CNEL contour are not residential. Current uses are industrial, evaporation ponds, and undeveloped land.

Noise contour inputs for 2022 include:

- ▶ Activity level increases (described in Chapter 2)
- ▶ Shift in mix of aircraft types to larger aircraft (described in Chapter 2)
- ▶ Extension of Runway 18L-36R by 880 feet to a length of 3,880 feet (described in Chapter 3)
- ▶ Creation of a helipad west of Taxiway A.

Under the forecast assumptions listed above, the 2022 noise contours have the same basic shape as current contours. However, the contours have been expanded by the forecast increase in operations. The 65 CNEL contour remains within airport property. The 60 CNEL contour extends beyond the airport to the north along the common approach path to Runway 18R. It also extends beyond airport property to the south along the common departure path from Runway 18R. The 55 CNEL contour lies largely outside the airport property.

Fortunately, no residential uses lie within any of the modeled noise contours at either current or forecast activity levels. Continued implementation of the adopted ALUC compatibility plan will ensure compatibility with future land uses. Noise complaints from areas outside of the noise contours can be addressed through existing management processes.

Cultural Resources

A record search was conducted by a cultural resources consultant in January 2003. The effort was in support of airport construction projects. This record search included all of the airport and its immediate environs. No historic structures or sites were identified. One archeological site on the airport was identified. The site is located east of Runway 18R-36L and north of Taxiway E. The site consisted of “a sparse lithic scatter, with four obsidian and one chert flakes.” This site is in an area that might be affected by construction of an additional exit taxiway for Runway 18R-36L. The site should be more precisely delineated and compared to the proposed site of the additional exit taxiway. If it appears likely that the site could be affected, additional analyses should be conducted to determine the significance of the site.

Air Quality

The volume of aircraft use is forecast to increase over the 20-year planning period. Growth in aircraft use will result in a parallel growth in automobile use. Both of these will cause an incremental increase in air pollutants attributable to airport operations. Construction activities will also create short-term increases in air pollution. It is anticipated that modeling will be required to quantify air quality impacts of Master Plan projects.

Traffic

Forecast growth in based and transient aircraft use will result in an increase in automobile traffic. Although the increase in traffic is not anticipated to be large, access to the airport will be via the congested Highway 12-29 intersection. The increase in airport-related traffic will incrementally contribute to the further congestion of the intersection. It is expected that traffic modeling will be needed to identify the magnitude of the impact. The likely mitigation for impacts will be contribution of funds towards intersection improvements.

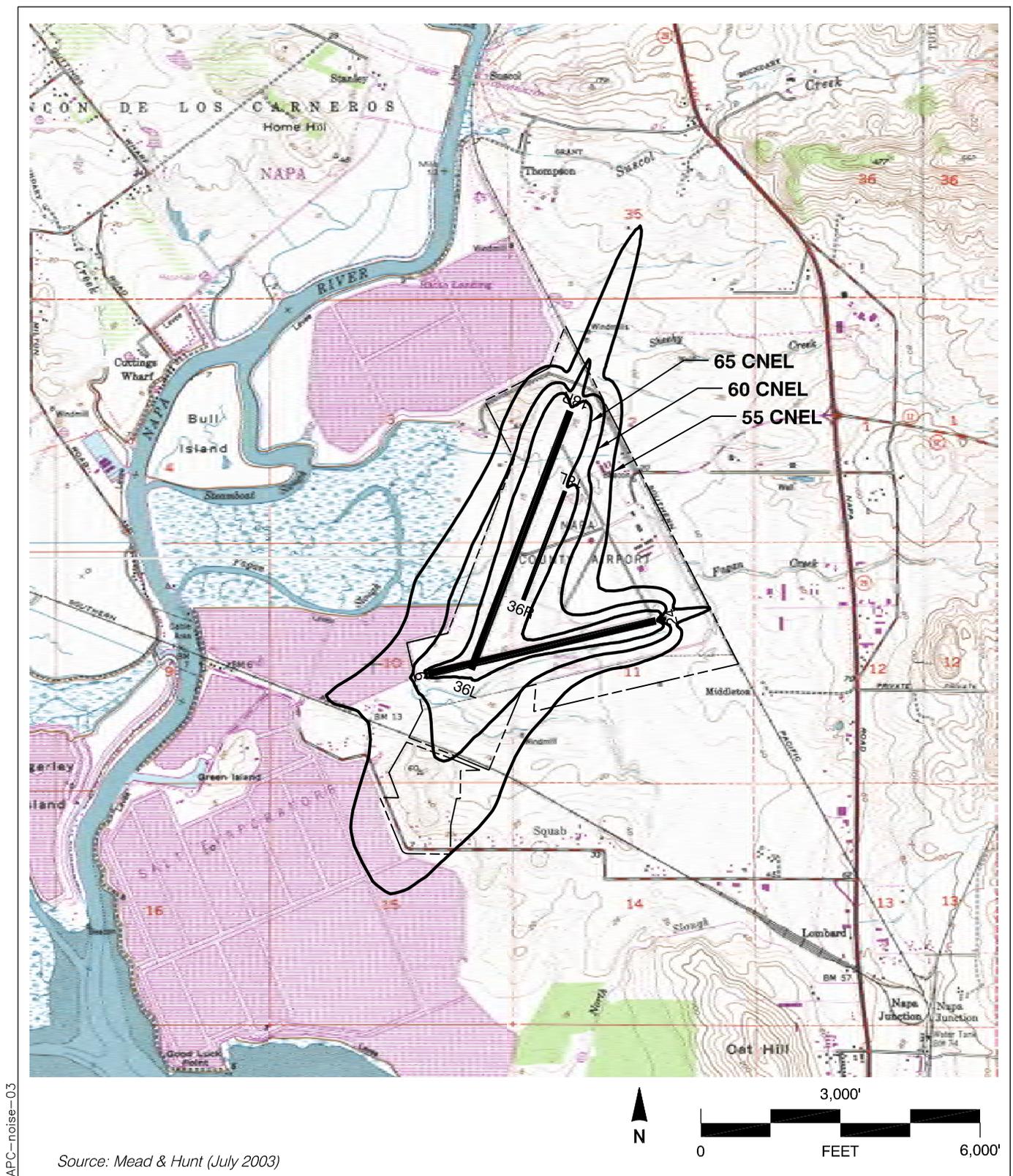
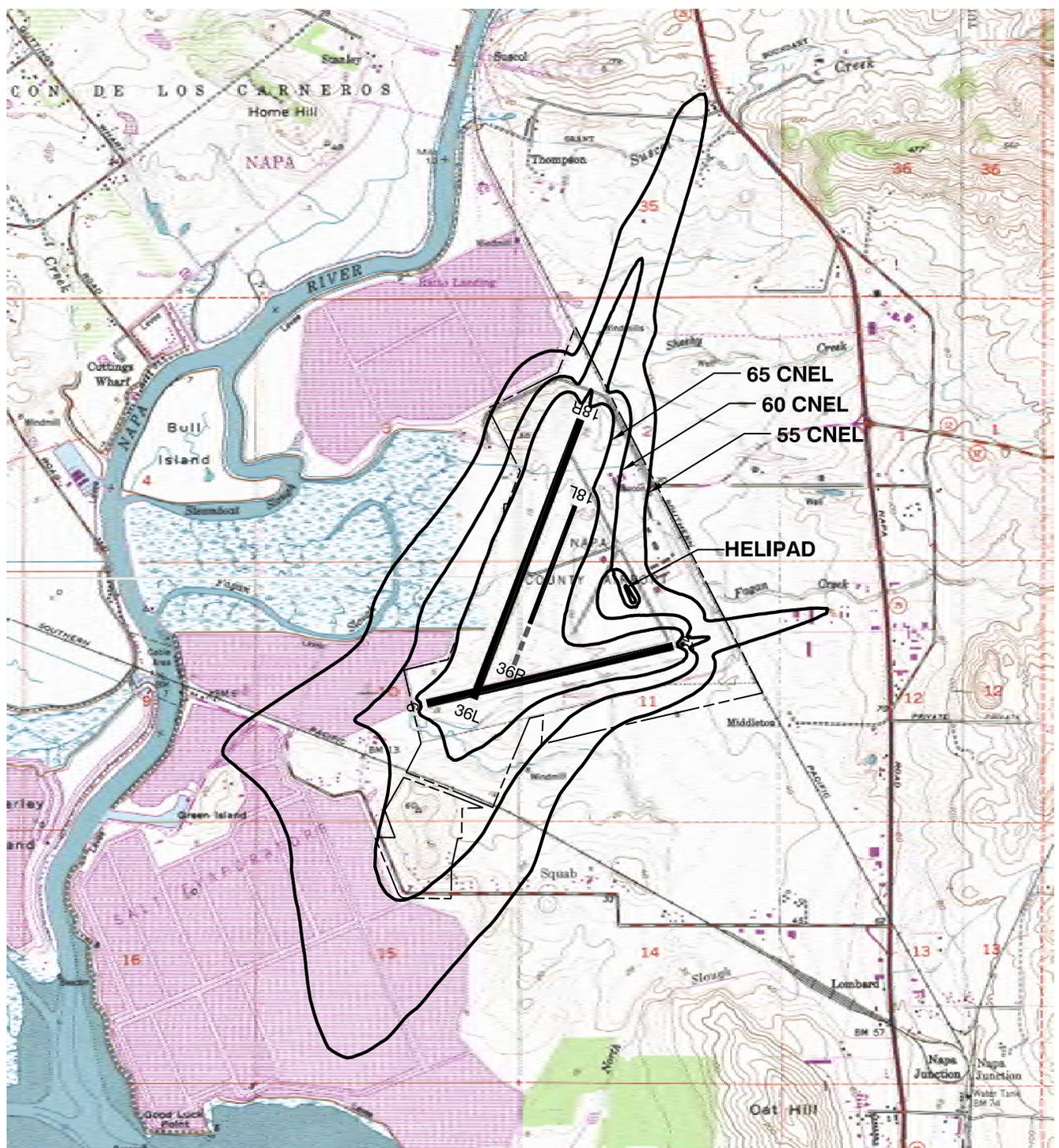


Exhibit 5A

Noise Contours - 2002

Napa County Airport



APC-noise-03

Source: Mead & Hunt (July 2003)

Exhibit 5B

Noise Contours - 2022 Napa County Airport

Hydrology

Most of the airport lies outside the 100-year flood zone presented on the Federal Emergency Management Agency's Flood Insurance Rate Maps No. 060205-0460B and 060205-0480B. The runways and building areas are designated as being in "areas of minimal flooding." Therefore, special building or site designs will not be required.

Environmental Review

Environmental review under the provisions of the California Environmental Quality Act will be required before this plan can be adopted. Based upon the available information, it is anticipated that a mitigated negative declaration would be needed to adopt this airport master plan.

Comprehensive Airport Land Use Plan

The Napa County Airport Land Use Commission adopted the *Airport Land Use Compatibility Plan* in 1991 and revised it in December 1999). The plan presents noise, safety and airspace policies for the Napa County Airport and Parrett Field (Angwin). The plan sets a limit of 55 CNEL for most residential uses in the airport's environs. A 60 CNEL limit can be applied for residential uses where higher ambient noise levels exist (e.g., next to freeways). The safety zones in this plan were defined to encompass areas that are regularly overflowed at and below traffic pattern altitude. Noise policies were linked to the 60 CNEL noise contour produced for the plan. Airspace policies were tied to the airspace surfaces defined in Federal Aviation Regulations Part 77.

State statutes require that the Airport Land Use Commission review the Airport Master Plan prior to its adoption by Napa County. The Commission's review will be to determine whether the proposed Airport Master Plan is consistent with the *Compatibility Plan*. As the airfield configuration has not changed, it is anticipated that the Master Plan will be found to be consistent.

Appendices



Chronology of Airport Development

- 1942 The main taxiway, primary and crosswind runways were originally constructed with federal funds to establish an Air Base for National Defense on land owned by Napa County.
- 1945 The Airport reverted back to the County for civilian use. The Napa County Board of Supervisors appointed a Napa County Airport Committee to foster development of airport plans and operations.
- 1947 Large hangar and shop built (Bridgeford Flying Service).
- 1948 East/west runway and taxiway paved (Federal Grant FAAP-01 \$26,600).
- 1951 Parking apron constructed (Federal Grant FAAP-02 \$8,134.54 and FAAP-03 \$8,534.16).
- 1952 Terminal building constructed (Federal Grant FAAP-04 \$30,000).
- 1956 Land Acquisition Parcels 2-9 (Federal Grant FAAP-05 \$32,514).
- 1957 Land acquisition, pave three aprons (Federal Grant FAAP-06 \$18,778).
- 1958 Parking apron construction (Federal Grant FAAP-07 \$12,788).
- 1959 Pave aprons, MIRL Runway 6-24; obstruction lights east approach (Federal Grant FAAP- 08 \$12,731).
- 1961 Land acquisition east Clear Zone (Areas 8 and 9); Wind Tee, Cone and Segmented Circle (Federal Grant FAAP-09 \$20,819).
- 1963 Apron expansion and construct Taxiway J (Federal Grant FAAP-10 \$22,042 and Federal Grant FAAP-11 \$7,157).
- 1964 Air Traffic Control Tower established, new beacon installed (Federal Grant FAAP-12 \$17,157.42).
- 1966 MIRL Runway 18-36, modernize vault (Federal Grant FAAP-13 \$11,154).
- 1967 Construction of two holding aprons (Federal Grant FAAP-14 \$7,576).
- 1968 Lengthen taxiways (Federal Grant FAAP-15 \$12,364).
- 1969 Expand aprons (Federal Grant FAAP-16 \$19,130).
- 1970 Napa Airport Master Plan (prepared by Wilsey & Ham) was adopted and Airport Manager position was authorized to supervise operations.

- 1971 Silverado Avionics, Inc. lease and large hangar constructed.
- 1971 IASCO lease executed and improvements for 32,000 sq. ft. 2-story office and 9,100 sq. ft. maintenance hangar completed.
- 1972 Land acquisition clear zone Runway 36; easement Runway 18 (Federal Grant ADAP-01 \$162,457).
- 1973 Construct parallel runway (18L-36R) and connecting taxiways; parking aprons expanded and strengthened (Federal Grant ADAP-02 \$139,515).
- 1974 Partial reconstruction of Runway 18R-36L; runway markings, apron lighting, fencing and emergency generator installed (Federal Grant ADAP-03 \$116,419).
- 1974 Proposed airport expansion Environmental Impact Report (draft prepared by August W. Compton & Assoc. and Final EIR prepared by James A. Roberts Associates, Inc.) led to County referendum on Airport expansion, which was subsequently defeated.
- 1975 Napa County Airport Master Plan (prepared by August W. Compton & Assoc.) adopted by the Board of Supervisors January 1976.
- 1975 Expanded IASCO facility with construction of 39,000 sq. ft. hangar.
- 1975 Construction of 650-foot extension to Runway 18R and 150-foot safety overrun to 36L.
- 1982 Expand parking apron, install of MITL on taxiways, survey Runway 6-24 and install signs (Federal Grant AIP-01 \$193,945).
- 1983 Construct aircraft parking apron (Federal Grant AIP-02 \$825,310).
- 1983 Construction of Taxiway and tie-down apron.
- 1983 Taxiway lighting and signing installation.
- 1984 Expand apron, overlay existing apron and access road; install MITL and three automatic vehicle gates (Federal Grant AIP-03 \$602,000).
- 1985 Airport Industrial Area Specific Plan and EIR prepared and adopted by the Board of Supervisors July 1986.
- 1986 Construct connecting Taxiway I to Runway 18R and partial parallel Taxiway H for Runway 6-24, holding aprons and MITL (Federal Grant AIP-04 \$761,054).
- 1987 Phase II of Taxiway H parallel Runway 6-24, fencing 52 acres, modernize ramp lighting and Fagan Creek drainage improvements (Federal Grant AIP-05)
- 1987 Japan Airlines (JAL) building addition, simulator room and addition to tiedown area.
- 1988 Airport Master Plan Update (Federal Grant AIP-06 \$67,304).

- 1989 Complete final construction of Taxiway H (Federal Grant AIP-07 \$950,000).
- 1991 JAL training facility expansion; tie-downs and overlay.
- 1991 Fuel tank removal and replacement with the new County fuel farm.
- 1991 Phase I of Taxiway J.
- 1992 Holding apron expansions of Taxiway F and Taxiway I.
- 1992 Taxiway E fillet extension.
- 1992 Runway 18L and 36R overlay.
- 1992 Runway 18R and 36L grading end.
- 1992 Electric gate installation.
- 1994 Phase III construction of T-hangars.
- 1994 Construction of CHP Hangar.
- 1995 Construction of Bridgeford hangar.
- 1997 Airport Road relocation.
- 1997 Executive hangar installation.
- 1998 Construction of shade hangars.
- 2000 Construct second row of Airport Shade Hangars.
- 2000 Spall Repair, Grind and Reseal Joints on Runway 6/24, Overlay Taxiway C and D (Federal Grant AIP 11-\$776,700).
- 2000 Construction of Palmaz Hangar.
- 2001 Taxiway J Extension Phase II (Federal Grant AIP 12/14-\$1,103,994).
- 2001 Airport Master Plan Update (Federal Grant AIP 13-\$175,000).
- 2001 Construction of Coppola Hangar.
- 2002 Airport Emergency Generator Installation (Federal Grant AIP 12-\$273,027).
- 2002 Construction of 12 T-hangars.
- 2002 Airport Guidance Sign Upgrade (Federal Grant AIP 14-\$220,092).

- 2002 Pavement Evaluation Study/Pavement Management Plan, Master Utility/Drainage Plan and Design Two Taxilanes and Access Road (AIP 16-\$150,770).
- 2002 Runway 18R-36L Spall Repair (Federal Grant AIP 16-\$75,793).
- 2003 Demolition of Taxiway A, Extension of Taxiway F, Construction of Helipad, Runway 18R Safety Grading, Design Runway 18L-36R Extension, Design Taxiway J Phase III Extension (Federal Grant AIP 14-\$1,678,779).
- 2003 Construction of Tallwood I Hangar.
- 2003 Construction of SK Aviation Hangar.
- 2003 Environmental Assessment (Federal Grant AIP 18/22-\$387,400).
- 2004 Land Acquisition of approximately 25.91 Acres (Federal Grant AIP 19-\$1,128,885).
- 2004 Construction of Rombauer Hangar.
- 2004 Construction of Self-Serve Fuel Island by Bridgeford.
- 2004 Construction of Perimeter Fence Phase I (Federal Grant AIP 15/17-\$576,867).
- 2005 Construction of Perimeter Fence Phase II, Exhibit A Map Update (Federal Grant AIP 17-\$409,680).
- 2005 Rehabilitate Taxiways and Apron Phase I, Construct Two Taxilanes and Access Road (Federal Grant AIP 20-\$2,565,763).
- 2006 Construction of Las Madronas Hangar.
- 2006 Construction of Tallwood II Hangar.
- 2006 Construction of Nieves Hangar.
- 2006 Construct Pollution Control Facility, Design Runway 18R-36L Rehabilitation (Federal Grant AIP 21-\$376,950).
- 2006 Construction of Erect-A-Tube Box Hangars.
- 2007 Rehabilitation of Runway 18R-36L (Federal Grant AIP 23-\$3,600,000).

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Glossary of Terms Used in Airport Master Planning

PREPARED FOR

NAPA COUNTY AIRPORT

PREFACE

Many technical terms and expressions are used in airport master planning and noise management programs. This glossary has been prepared for the Napa County Airport and interested members of the public. The definitions in this glossary were compiled from various sources including government publications such as Federal Aviation Administration (FAA) Advisory Circulars, FAA Orders, the Federal Aviation Regulations (FARs) and professional literature.

AAAE (Triple-A E) - American Association of Airport Executives.

A-WEIGHTED SOUND LEVEL (dBA) - The human ear does not respond equally to all sound frequencies. It is less efficient at low and high frequencies than it is at medium or speech-range frequencies. Thus, to obtain a single number representing the sound level of a noise having a wide range of frequencies in a manner representative of the ear's response, it is necessary to reduce the effects of the low and high frequencies with respect to the medium frequencies. The resultant sound level is said to be A-weighted, and the units are decibels (dB); hence, the abbreviation is dBA. The A-weighted sound level is also called the noise level. Sound level meters have an A-weighting network for measuring A-weighted sound level.

ABOVE GROUND LEVEL (AGL) - An elevation datum given in feet above ground level.

ABSORPTION - Absorption is a property of materials that reduces the amount of sound energy reflected. Thus, the introduction of an "absorbent" into the surfaces of a room will reduce the sound pressure level in that room because sound energy striking the room surfaces will not be totally reflected. The process of absorption is entirely different from that of transmission loss through a material, which determines how much sound enters a room via the walls, ceiling, and floor. The effect of absorption merely reduces the resultant sound level in the room produced by energy that has already entered the room.

AC - See **ADVISORY CIRCULAR**

ACOUSTICS - (1) The science of sound, including the generation, transmission, and effects of sound waves both audible and inaudible; (2) The physical qualities of a room or other enclosure (such as size, shape, amount of noise) that determine the audibility and perception of speech and music.

ADT - See **AVERAGE DAILY TRAFFIC**

ADVISORY CIRCULAR (AC) - A series of external FAA publications consisting of all non-regulatory material of a policy, guidance, and informational nature.

AERONAUTICAL CHART - A representation of a portion of the earth, its culture and relief, specifically designated to meet the requirements of air navigation.

AFFECTED LOCAL GOVERNMENT AGENCIES - The local government agencies that have the authority to control land uses in areas that are adversely affected by aviation activities.

AGL - See **ABOVE GROUND LEVEL**

AIM - See **AIRMAN'S INFORMATION MANUAL**

AIP PROGRAM - See **AIRPORT IMPROVEMENT PROGRAM**

AIR CARRIER - A legal entity that undertakes directly by lease or other arrangements, to engage in air transportation.

AIR CARRIER, CERTIFICATED ROUTE - An air carrier holding a Certificate of Public Convenience and Necessity, issued by the U.S. Department of Transportation under Part 121 of the Federal Aviation Regulations (FAR), to conduct scheduled services over specified routes and a limited amount of nonscheduled operations.

AIR CARRIER, COMMUTER - An air taxi operator who, under FAR Part 135, (1) performs at least five round trips per week between two or more points and publishes flight schedules which specify the times, days of the week, and places between which such flights are performed; or (2) transports mail by air pursuant to a contract with the U.S. Postal Service.

AIRCRAFT ACCIDENT - An occurrence associated with the operation of an aircraft which takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, and in which any person suffers death or serious injury as a result of being in or upon the aircraft or by direct contact with the aircraft or anything attached thereto, or in which the aircraft receives substantial damage.

AIRCRAFT APPROACH CATEGORY - A grouping of aircraft based on a speed of 1.3 times the stall speed in the landing configuration at maximum gross landing weight. An aircraft shall fit in only one category. If it is necessary to maneuver at speeds in excess of the upper limit of a speed range for a category, the minimums for the next higher category should be used. For example, an aircraft which falls in Category A, but is circling to land at a speed in excess of 91 knots, should use the approach Category B minimums when circling to land. The categories are as follows:

1. Category A. Speed less than 91 knots.
2. Category B. Speed 91 knots or more but less than 121 knots.
3. Category C. Speed 121 knots or more but less than 141 knots.
4. Category D. Speed 141 knots or more but less than 166 knots.
5. Category E. Speed 166 knots or more.

AIRCRAFT CLASSES – For the purposes of Wake Turbulence Separation Minima, ATC classifies aircraft as Heavy, Large, and Small as follows:

1. Heavy. Aircraft capable of takeoff weights of 300,000 pounds or more whether or not they are operating at this weight during a particular phase of flight.
2. Large. Aircraft of more than 12,500 pounds, maximum certificated takeoff weight, up to 300,000 pounds.
3. Small. Aircraft of 12,500 pounds or less maximum certificated takeoff weight.

AIRCRAFT PARKING LINE LIMIT (APL) - A line established by the airport authorities beyond which no part of a parked aircraft should protrude.

AIRFIELD CAPACITY (HOURLY) - The maximum number of aircraft operations (landings or takeoffs) that can take place on an airfield in one hour under specific conditions.

AIRMAN'S INFORMATION MANUAL (AIM) - A primary FAA publication whose purpose is to instruct airmen about operating in the National Airspace System of the U.S. It provides basic flight information, ATC Procedures and general instructional information concerning health, medical facts, factors affecting flight safety, accident and hazard reporting, and types of aeronautical charts and their use.

AIRPORT - An area of land or water that is used or intended to be used for the landing and taking off of aircraft, and includes its buildings and facilities, if any.

AIRPORT ELEVATION - The highest point of an airport's usable runways, measured in feet above mean sea level.

AIRPORT ENVIRONS - The area surrounding an airport that is considered to be directly affected by the presence and operation of that airport.

AIRPORT HAZARD - Any structure or natural object located on or in the vicinity of a public airport, or any use of land near such airport, that obstructs the airspace required for the flight of aircraft landing, taking off, or taxiing at the airport.

AIRPORT IMPROVEMENT PROGRAM (AIP) - The AIP program is administered to provide financial grants-in-aid for airport development projects such as runways, taxiways, aircraft parking aprons, terminal buildings and land acquisition associated with airport development including runway protection zones and approach protection.

AIRPORT LAND USE COMMISSION (ALUC) - In California, a state-authorized body existing in each county having the responsibility to develop plans for achieving land use compatibility between airports and their environs.

AIRPORT LAND USE PLAN (ALUP) - In California, the formal plan, developed and adopted by an ALUC, setting forth criteria, policies and specifications for the preservation of long-term, land use compatibility between an airport and its environs.

AIRPORT LAYOUT PLAN - A plan (drawings) for an airport showing boundaries and proposed additions to all areas owned or controlled by the sponsor for airport purposes, the location and nature of existing and proposed airport facilities and structures, and the location on the airport of existing and proposed non-aviation areas and improvements thereon.

AIRPORT MASTER PLAN - An assembly of appropriate documents and drawings covering the development of a specific airport from a physical, economic, social, and political jurisdictional perspective. The Airport Layout Plan is a part of this plan.

AIRPORT NOISE COMPATIBILITY PLANNING STUDY - A study designed to increase the compatibility of land and facilities in the areas surrounding an airport that are most directly affected by the operation of the airport. The specific purpose is to reduce the adverse effects of noise as much as possible by implementing both on-airport noise control measures and off-airport land use control programs. The basic products of an Airport Noise Compatibility Planning Study typically include:

- (1) workable on-airport noise abatement actions such as preferential runway use programs, new or preferential flight tracks, curfews, etc.;
- (2) off-airport land use control programs and regulations such as land acquisition, soundproofing, or special actions and programs; and
- (3) policies and procedures related to the implementation of on-airport and off-airport programs.

A community involvement program is usually carried on throughout all phases of the study. Conduct of such studies is eligible for federal funding participation. (Also see FAR Part 150.)

AIRPORT PROPRIETOR - Owner of an airport or other party having authority to control airport operations. In California, the holder of an airport permit issued by the Department of Transportation, Division of Aeronautics pursuant to Article 3, Chapter 4, Part 1, Division 9, Public Utilities Code.

AIRPORT RADAR SERVICE AREA (ARSA) - Regulatory airspace surrounding designated airports wherein FAA Air Traffic Control provides radar vectoring and sequencing on a full-time basis for all IFR and VFR aircraft. As of September 1993, the term ARSA has been replaced by the term Class C Airspace.

AIRPORT REFERENCE POINT - A point established on an airport, having an equal relationship to all existing and proposed landing and takeoff areas, and used to geographically locate the airport for other planning purposes.

AIRPORT SPONSOR - A public agency or tax-supported organization, such as an airport authority, that is authorized to own and operate an airport, to obtain property interests, to obtain funds, and to be legally, financially, and otherwise able to meet all applicable requirements of the current laws and regulations.

AIRPORT SURVEILLANCE RADAR (ASR) - Approach control radar used to detect and display an aircraft's position in the terminal area. ASR provides range and azimuth information but does not provide elevation data. Coverage of the ASR can extend up to 60 miles.

AIRPORT TRAFFIC AREA - Unless otherwise specifically designated in FAR Part 93, that airspace within a horizontal radius of 5 statute miles from the geographical center of any airport at which a control tower is operating, extending from the surface up to, but not including, an altitude of 3,000 feet above the elevation of an airport. Unless otherwise authorized by ATC, no person may operate an aircraft within an airport traffic area except for the purpose of landing at or taking off from an airport within that area. ATC authorizations may be given as individual approval of specific operations or may be contained in written agreements between airport users and the tower concerned.

AIRPORT TRAFFIC CONTROL TOWER (ATCT) - A terminal facility that uses air-to-ground communications, visual signaling, and other devices to provide ATC services to aircraft operating in the vicinity of an airport or on the movement area.

AIR ROUTE SURVEILLANCE RADAR (ARSR) - Air route traffic control center (ARTCC) radar used primarily to detect an aircraft's position, which en route between terminal areas, enabling controllers to provide radar air traffic control service when aircraft are within the ARSR coverage.

AIR ROUTE TRAFFIC CONTROL CENTER (ARTCC) - An FAA facility established to provide air traffic control service to aircraft operating on an instrument flight rule (IFR) flight plan within controlled airspace and principally during the en route phase of flight.

AIR TAXI - Operations performed by operators of aircraft holding an air taxi certificate under Part 135 of the Federal Aviation Regulations. This category includes commuter airline operations (excluding certificated commuter airlines), mail carriers under contract with the U.S. Postal Service, and operators of nonscheduled air taxi services. Typically, air taxis do not utilize aircraft with a payload capacity over 7,500 pounds or capable of carrying more than 30 passengers.

AIR TRAFFIC - Aircraft operating in the air or on an airport surface, exclusive of loading ramps and parking areas.

AIR TRAFFIC CLEARANCE/ATC CLEARANCE - An authorization by air traffic control, for the purpose of preventing collision between known aircraft, for an aircraft to proceed under specified traffic conditions within controlled airspace.

AIR TRAFFIC CONTROL (ATC) - A service operated by appropriate authority (the FAA) to promote the safe, orderly, and expeditious flow of air traffic.

AIRWAY/FEDERAL AIRWAY - A Class E airspace area established in the form of a corridor, the centerline of which is defined by radio navigational aids. (See also **CONTROLLED AIRSPACE**.)

ALERT AREA - A special use airspace that may contain a high volume of pilot training activities or an unusual type of aerial activity, neither of which is hazardous to aircraft.

ALPA - Airline Pilot's Association.

ALTITUDE - The height of a level, point, or object measured in feet Above Ground Level (AGL) or from Mean Sea Level (MSL).

ALUC - See **AIRPORT LAND USE COMMISSION**

ALUP - See **AIRPORT LAND USE PLAN**

AMBIENT NOISE - The total of all noise in a system or situation, independent of the presence of the specific sound to be measured. In acoustical measurements, strictly speaking, ambient noise means electrical noise in the measurement system. However, in popular usage ambient noise means is also used with the same meaning as "background noise" or "residual noise." (See also **AMBIENT NOISE LEVEL**.)

AMBIENT NOISE LEVEL – The composite of noise from all sources near and far. The ambient noise level constitutes the normal or existing level of environmental noise at a given location. (i.e., the background noise level.)

APPROACH CLEARANCE - Authorization by ATC for a pilot to conduct an instrument approach at an airport with appropriate facilities.

APPROACH LIGHT SYSTEM (ALS) - An airport lighting system which provides visual guidance enabling a pilot to align the aircraft with the extended runway centerline during final approach to landing.

APPROACH SPEED - The recommended speed contained in aircraft manuals used by pilots when making an approach to landing. This speed will vary for different segments of an approach as well as for aircraft weight and configuration.

APRON/RAMP - A defined area on an airport or heliport intended to accommodate aircraft for purposes of loading passengers or cargo, refueling, parking, or maintenance.

ARSR - See **AIR ROUTE SURVEILLANCE RADAR**

ARTCC - See **AIR ROUTE TRAFFIC CONTROL CENTER**

ASNA - See **AVIATION SAFETY AND NOISE ABATEMENT ACT OF 1979**

ASR - See **AIRPORT SURVEILLANCE RADAR**

ATA - Air Transport Association.

ATC - See **AIR TRAFFIC CONTROL**

ATIS - See **AUTOMATIC TERMINAL INFORMATION SERVICE**

AUTOMATED WEATHER OBSERVING SYSTEM (AWOS) - Airport electronic equipment which automatically measures meteorological parameters, reduces and analyzes the data via computer, and broadcasts weather information which can be received on aircraft radios.

AUTOMATIC TERMINAL INFORMATION SERVICE (ATIS) - The continuous broadcast of recorded non-control information in selected terminal areas (e.g. time, weather, ceiling, visibility, etc.).

AVERAGE DAILY TRAFFIC (ADT) - An expression of traffic volume, ADT means the average number of vehicles per day that pass over a given point.

AVIATION SAFETY AND NOISE ABATEMENT ACT OF 1979 (ASNA) - Public Law 96-193, enacted February 18, 1980. The purpose of the Act is to provide assistance to airports in preparing and carrying out noise compatibility programs and in assuring continued safety for aviation. The Act also contains provisions that extend, until January 1, 1988, the requirement for certain types of aircraft to comply with Part 36 of the Federal Aviation Regulations (see also FAR Part 36 and FAR Part 150). Funding for the noise studies has been appropriated by the U.S. Congress and has commenced in 1983. Funding for program implementation, including acquisition and soundproofing of affected residences, has been approved by FAA and is being implemented at several U.S. airports.

AVIGATION EASEMENT - A type of acquisition of an interest in land or property that involves less-than-fee purchase (see also **LESS-THAN-FEE ACQUISITION**). One form of avigation easement grants an airport the right to perform aircraft operations over the designated property, including operations that might cause noise, vibration, and other effects. A stronger form of easement is a deed restriction that may include (1) the right to perform aircraft operations on the property, and (2) public acquisition of a landowner's rights restricting future development of the

property for any use more intensive than that existing at the time of the transaction. This easement may also include specific prohibitions on the uses for which the property may be developed. Maximum heights of structures and other objects may also be specified.

AZIMUTH - Horizontal direction or bearing; usually measured from the reference point of 0 degrees clockwise through 360 degrees.

BACKCOURSE APPROACH - A non-precision instrument approach utilizing the rearward projection of the ILS localizer beam.

BACKGROUND NOISE - See **AMBIENT NOISE**.

BAFFLE - A baffle is a shielding structure or series of partitions used to increase the effective length of the external transmission path between two points in an acoustic system. For example, baffles may be used in sound traps (as in air conditioning ducts) or in automotive mufflers to decrease the sound transmitted while affording a path for airflow.

BASED AIRCRAFT - Aircraft stationed at an airport on a long-term or permanent basis, usually by some form of agreement between the aircraft owner and airport management.

BASE LEG - A flight path at right angles to the landing runway off its approach end. The base leg normally extends from the downwind leg to the intersection of the extended runway centerline. (See also **TRAFFIC PATTERN**.)

BLAST PAD - A paved area, of runway width, extending beyond the runway takeoff threshold for a sufficient distance (typically 150 to 300 feet) to prevent soil erosion caused by jet engine backblast.

BUILDING CODE - A legal document that sets forth requirements to protect the public health, safety and general welfare as they relate to the construction and occupancy of buildings and structures. The code establishes the minimum acceptable conditions for matters found to be in need of regulation. Topics generally covered are exits, fire protection, structural design, sanitary facilities, light, and ventilation. Sound insulation may also be included.

BUILDING RESTRICTION LINE (BRL) - A line established with respect to the runway centerline to assure that structures will not project above the imaginary surfaces required by Federal Aviation Regulations, Part 77, "*Obstruction Clearance Criteria*," (FAR Part 77).

BUSINESS AVIATION - The sector of general aviation (as defined by ICAO) which concerns the operation of aircraft by companies for the carriage of passengers or goods as an aid to the conduct of their business, flown for purposes generally considered not for public hire, and piloted by individuals having at the minimum a valid commercial pilot license with an instrument rating.

CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA) – An Act of the State of California designed to:

- (1) Inform governmental decision-makers and the public about the potential, significant environmental effects of proposed activities.
- (2) Identify the ways that environmental damage can be avoided or significantly reduced.

- (3) Prevent significant, avoidable damage to the environment by requiring changes in projects through the use of alternatives or mitigation measures when the governmental agency finds the changes to be feasible.
- (4) Disclose to the public the reasons why a governmental agency approved the project in the manner the agency chose if significant environmental effects are involved. (CEQA Guidelines, Sec. 15002[a]).

CATEGORICAL EXEMPTION - An exemption from CEQA for classes of projects based on findings by the secretary of the resources agency that the listed classes of projects do not have a significant effect on the environment.

CBD - Central Business District

CEILING - Height above the earth’s surface to the lowest layer of clouds or obscuring phenomena that is reported as “broken,” “overcast,” or “obscuration” and not classified as “thin” or “partial.”

CEQ - See **COUNCIL ON ENVIRONMENTAL QUALITY**

CEQ 1500 - Regulations of the Federal Council on Environmental Quality (CEQ) for implementing the procedural provisions of the National Environmental Policy Act (NEPA).

CEQA - See **CALIFORNIA ENVIRONMENTAL QUALITY ACT**

CERTIFICATED ROUTE AIR CARRIER - See **AIR CARRIER, CERTIFICATED ROUTE**

CIRCLING APPROACH/CIRCLE-TO-LAND MANEUVER - A maneuver initiated by the pilot to align the aircraft with a runway for landing when a straight-in landing from an instrument approach is not possible or not desirable.

CLEAR ZONE - See **RUNWAY PROTECTION ZONE**

CLEARWAY - For turbine engine powered airplanes certificated after August 29, 1959, an area beyond the runway, not less than 500 feet wide, centrally located about the extended centerline of the runway, and under the control of the airport authorities. The clearway is expressed in terms of clearway plane, extending from the end of the runway with an upward slope not exceeding 1.25 percent, above which no object nor any terrain protrudes. However, threshold lights may protrude above the plane if their height above the end of the runway is 26 inches or less and if they are located to each side of the runway.

CNEL - See **COMMUNITY NOISE EQUIVALENT LEVEL.**

COMMON TRAFFIC ADVISORY FREQUENCY (CTAF) - A frequency designed for the purpose of carrying out airport advisory practices while operating to or from an uncontrolled airport. The CTAF may be a UNICOM, Multicom, FSDS, or tower frequency and is identified in appropriate aeronautical publications.

COMPASS LOCATOR - A low power, low or medium frequency radio beacon installed at the site of the outer or middle marker of an instrument landing system (ILS).

COMMUNITY NOISE EQUIVALENT LEVEL (CNEL) - A method of predicting, by a single number rating, cumulative aircraft noise that affects communities in airport environs. As defined in the California Airport Noise Standards, CNEL represents the average daytime noise level during a 24-hour day, adjusted to an equivalent level to account for the lower tolerance of people to noise during evening and nighttime periods relative to the daytime period. Weighting factors equivalent to penalties of about five decibels and ten decibels are applied to operations conducted from 7:00 PM to 10:00 PM and from 10:00 PM to 7:00 AM, respectively, to account for increased sensitivity during those periods.

COMMUTER AIR CARRIER - See **AIR CARRIER, COMMUTER**

COMPREHENSIVE LAND USE PLAN (CLUP) - See **ALUP**.

COMPUTER MODELING - An analytical process, which employs an electronic digital computer to perform difficult, laborious calculations involving mathematical functions or formulas. Computation of cumulative noise exposure (Ldn or CNEL) contours requires the use of computer modeling in order to process enormous quantities of data concerning aircraft traffic, performance and operating procedures.

CONTROLLED AIRSPACE - Any of several types of airspace within which some or all aircraft may be subject to air traffic control. An airspace of defined dimensions within which air traffic control service is provided to IFR flights and to VFR flights in accordance with the airspace classification. Controlled airspace is a generic term that covers Classes A-E airspace. Controlled airspace is also that airspace within which all aircraft operators are subject to certain pilot qualifications, operating rules, and equipment requirements in Part 91 (for specific operating requirements, please refer to Part 91). For IFR operations in any class of controlled airspace, a pilot must file an IFR flight plan and receive an appropriate ATC clearance. Each Class B, Class C, and Class D airspace area designated for an airport contains at least one primary airport around which the airspace is designated (for specific designations and descriptions of the airspace classes, refer to FAR Part 71).

COUNCIL ON ENVIRONMENTAL QUALITY (CEQ) - Established by the National Environmental Policy Act (NEPA) of 1969, the Council is composed of three members appointed by the President. A major purpose of the Council is to formulate and recommend national policies to promote the improvement of environmental quality.

CTAF - See **COMMON TRAFFIC ADVISORY FREQUENCY**.

DATABASE - A computer file (or set of files) containing a field of related numerical information (data) for use in automated analysis or processing. A computerized "land use database" is a computer file containing the coordinates, dimensions and areas of all individual land use polygons which comprise the pattern of land use within a specific geographic area.

DAY-NIGHT AVERAGE SOUND LEVEL (DNL or Ldn) - A method for predicting, by a single number rating, cumulative aircraft noise that affects communities in airport environs. The Ldn

value represents decibels of noise as measured by an A-weighted sound-level meter (see also). In the Ldn procedure, the noise exposure from each aircraft takeoff or landing at ground level around an airport is calculated, and these noise exposures are accumulated for a typical 24-hour period. (The 24-hour period often used is the average day of the year being analyzed.) Daytime and nighttime noise exposures are considered separately. A weighting factor equivalent to a penalty of 10 decibels is applied to operations between 10:00 p.m. and 7:00 am to account for the increased sensitivity of people to nighttime noise. The Ldn values can be expressed graphically on maps using contours of equal noise exposure. Ldn may also be used for measuring other noise sources, such as automobile traffic, to determine combined noise effects.

dB - See **DECIBEL, dB**

DECIBEL, dB - A unit for describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micronewtons per square meter).

DEREGULATIONS ACT - Airline regulatory reform act of 1978. Designed, among other things, to encourage competition among domestic air carriers, the Act allows an air carrier greater freedom to enter and leave any given market.

DEVELOPMENT RIGHTS - Rights of landowners to develop a parcel of land according to the zoning of that parcel. Land is often assessed on a combination of its “resource” value and its “commodity” value. The resource value is the value of the property in its natural state; the commodity value is an artificial value placed on it by the marketplace - that is, its value for development purposes. In less-than-fee acquisition (see also), the airport sponsor purchases only the development rights; the ownership of the land remains unchanged.

DIGITIZE - A mechanical-electronic process whereby the locations, sizes and identities of individual polygons, noise contours or other physical features are translated into a set of numerical data within a computer data file or database for subsequent automated analysis, sorting or manipulation.

DISPLACED THRESHOLD - A runway-landing threshold that is located at a point other than the designated beginning of the runway (where departures would begin).

DISTANCE MEASURING EQUIPMENT (DME) - Equipment (airborne and ground) used to measure, in nautical miles, the slant range distance of an aircraft from the DME navigational aid.

DME - See **DISTANCE MEASURING EQUIPMENT**

DNL - See **DAY-NIGHT AVERAGE SOUND LEVEL**

DOWNWIND LEG - A flight path parallel to the landing runway in the direction opposite the landing direction.

DURATION - Length of time, in seconds, a noise event such as an aircraft flyover is experienced. (May refer to the length of time a noise event exceeds a specified threshold level.)

EA - See **ENVIRONMENTAL ASSESSMENT**

EFFECTS - See **IMPACT**

EIR - See **ENVIRONMENTAL IMPACT REPORT**

EIS - See **ENVIRONMENTAL IMPACT STATEMENT**

ENGINE RUN-UP AREA - An area on an airport where aircraft engines are serviced or tested. The noise from such servicing or testing can affect neighborhoods adjacent to the airport.

ENVIRONMENTAL ASSESSMENT (EA) - An assessment of the environmental effects of a proposed action for which federal financial assistance is being requested or for which federal authorization is required. The EA serves as the basis for the FAA's Environmental Impact Statement (EIS) or Finding of No Significant Impact (FONSI), as specified in FAA Orders 1050.1D and 5050.4.

ENVIRONMENTAL IMPACT REPORT (EIR) – An EIR is a detailed statement prepared in accordance with CEQA describing a proposed project, analyzing significant environmental effects of the proposed project, identifying a reasonable range of alternatives, and discussing possible ways to mitigate or avoid the significant environmental effects.

ENVIRONMENTAL IMPACT STATEMENT (EIS) – A document prepared under the requirements of the National Environmental Policy Act of 1969 (NEPA), Section 102(2)(c). The EIS represents a federal agency's evaluation of the effect of a proposed action on the environment. New regulations relating to the preparation of an EIS are published in FAA Orders 1050.1D and 5050.4.

ENPLANED/DEPLANED PASSENGERS - The volume of passengers outbound from an airport (enplaned) or inbound to an airport (deplaned). The annual passenger volume of an airport is the total of enplaned and deplaned passengers.

EQUIVALENT ENERGY LEVEL, Leq - The sound level corresponding to a steady state sound level containing the same total energy as a time varying signal over a given sample period. Leq is typically computed over 1, 8 and 24-hour sample periods.

EPA - The U.S. Environmental Protection Agency

FAA - See **FEDERAL AVIATION ADMINISTRATION**

FAA NOISE POLICY - The Aviation Noise Abatement Policy of the Department of Transportation, Federal Aviation Administration issued on November 18, 1976. The policy outlines the responsibilities and actions that may be taken to reduce adverse effects of aviation-related noise.

FAA ORDER - An internal FAA directive which sets standards, procedures and guidelines for FAA execution of its various regulatory and grant administration mandates.

FAA ORDER 1050.1D - An order published by the FAA, dated December 21, 1983, entitled "*Policies and Procedures for Considering Environmental Impacts.*" This order was prepared in response to the CEQ 1500 Regulations.

FAA ORDER 5050.4A - This document, entitled "*Airport Environmental Handbook,*" was revised by the FAA on October 8, 1985. It contains all of the essential information an airport sponsor needs to meet both procedural and substantive environmental requirements, including relevant text from Order 1050.1D.

FAR – See **FEDERAL AVIATION REGULATIONS (FAR)**

FAR PART 36 - Federal Aviation Regulations, Part 36. Establishes noise standards for the civil aviation fleet. Some extensions for compliance are included in the Aviation Safety and Noise Abatement Act of 1979 (see also).

FAR PART 77 - Federal Aviation Regulations, Part 77. Establishes standards for identifying obstructions to aircraft in navigable airspace.

FAR PART 77 SURFACES - Imaginary surfaces established with relation to each runway of an airport. There are five types of surfaces: (1) primary, (2) approach, (3) transitional, (4) horizontal, and (5) conical.

FAR PART 91 – Establishes criteria for general operating and flight rules.

FAR PARTS 121 AND 135 - The parts of Federal Aviation Regulations that deal with certification and operational requirements for commercial operators of large aircraft and air taxis, respectively.

FAR PART 150 - Federal Aviation Regulations, Part 150. Effective February 28, 1982, FAR Part 150 is the regulation that implements the noise compatibility standards and provisions contained in the Aviation Safety and Noise Abatement Act of 1979 (ASNA). FAR Part 150 prescribes procedures for airport sponsors who wish to develop Noise Exposure Maps and Airport Noise Compatibility Plans to identify and mitigate airport - land use compatibility problems. FAR Part 150 was published in the Federal Register in amended form September 14, 1993.

FBO - See **FIXED BASE OPERATOR**.

FEDERAL AVIATION ADMINISTRATION - The FAA is the agency of the U.S. Department of Transportation that is charged with (1) regulating air commerce to promote its safety and development; (2) achieving the efficient use of navigable airspace of the United States; (3) promoting, encouraging, and developing civil aviation; (4) developing and operating a common system of air traffic control and air navigation for both civilian and military aircraft; and (5) promoting the development of a national system of airports.

FEDERAL AVIATION REGULATIONS (FAR) - Regulations established by the Federal Aviation Administration (FAA). These regulations are the rules that govern the operation of aircraft, airways, and airmen.

FEE-SIMPLE LAND ACQUISITION (PURCHASE) - The full purchase by the airport sponsor of land and improvements. The land is usually maintained for airport purposes or leased for uses that are compatible with airport operations. Alternatively, the airport sponsor can resell the land with an avigation easement (see also) and deed restrictions that specify the compatible land uses that are permitted. The resale option has the benefit that the land is returned to the tax rolls.

FERRY FLIGHT – A flight for the purpose of:

1. Returning an aircraft to base.
2. Delivering an aircraft from one location to another.
3. Moving an aircraft to and from a maintenance base.

FINDING OF NO SIGNIFICANT IMPACT (FONSI) - An administrative determination by the FAA that a proposed action by the airport sponsor will have no significant impact (on the environment). Specific guidelines for the preparation of a FONSI report (see EA) are included in FAA Orders 1050.1D and 5050.4A.

FIXED BASE OPERATOR (FBO) – (1) A business operating at an airport that provides aircraft services to the general public, including but not limited to sale of fuel and oil; aircraft sales, rental, maintenance and repair; parking and tie down or storage of aircraft; flight instruction; air taxi/charter operations; and specialty services, such as instrument and avionics maintenance, painting, overhaul, aerial application, aerial photography, aerial hoists or pipeline patrol. (2) The owner of such an operation.

FLIGHT PATH/TRACK - A line, course, or track along which an aircraft is flying or intended to be flown.

FLIGHT SERVICE STATION (FSS) - FAA facilities that provide pilot briefings on weather, airports, altitudes, routes, and other flight planning information. More specifically, these FSS facilities also provide en route communications and VFR search and rescue services, assist lost aircraft and aircraft in emergency situations, relay ATC clearances, originate Notices to Airmen, broadcast aviation weather and NAS information, receive and process IFR flight plans, and monitor NAVAID's. In addition, at selected locations, FSS's provide Enroute Flight Advisory Service (Flight Watch), take weather observations, issue airport advisories, and advise Customs and Immigration of transborder flights.

FLIGHT STANDARDS DISTRICT OFFICE (FSDO) - An FAA field office serving an assigned geographical area and staffed with Flight Standards personnel who serve the aviation industry and the general public on matters relating to the certification and operation of air carrier and general aviation aircraft. Activities include general surveillance of operational safety, certification of airmen and aircraft, accident prevention, investigation, enforcement, etc.

FLIGHT WATCH - A shortened term for use in air-ground contacts to identify the flight service station providing En Route Flight Advisory Service; e.g., "Oakland Flight Watch."

FLIGHT VISIBILITY - See **VISIBILITY**.

FLOW CONTROL - Measures designed to adjust the flow of traffic into a given airspace, along a given route, or bound for a given aerodrome (airport) so as to ensure the most effective utilization of the airspace.

FONSI - See **FINDING OF NO SIGNIFICANT IMPACT**

FRACTIONAL OWNERSHIP - A company or individual buys, or leases, a fractional interest in one aircraft just as they might acquire a partial interest in one condo unit. They can use their own aircraft or another similar or identical aircraft a certain number of hours or days per year. The economics of each situation differs depending on the number of people who will use the aircraft, the value of their time to the company, and the dollars saved in airline tickets, hotels, etc.

GENERAL AVIATION (GA) - All civil aviation except that classified as air carrier or air taxi. The types of aircraft typically used in general aviation activities vary from multi-engine jet aircraft to single-engine piston aircraft.

GENERAL AVIATION OPERATIONS - Operations performed by all civil aircraft not classified as air carrier or air taxi aircraft.

GLIDE SLOPE (GS) - An electronic signal radiated by a component of an ILS to provide descent path guidance to approaching aircraft.

GLOBAL POSITIONING SATELLITE SYSTEM (GPS) - A navigational system utilizing satellites to provide non-precision guidance in azimuth, elevation, and distance measurement.

GROUND VISIBILITY - See **VISIBILITY**.

HEAVY AIRCRAFT - Aircraft capable of takeoff weights of 300,000 pounds or more whether or not they are operating at this weight during a particular phase of flight.

HELICOPTER - Rotorcraft that, for its horizontal motion, depends principally on its engine-driven rotors.

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

HELIPORT - An area of land, water, or structure used or intended to be used for the landing and takeoff of helicopters and includes its buildings and facilities if any.

HUD - The U.S. Department of Housing and Urban Development

ICAO - International Civil Aviation Organization.

IFR - See **INSTRUMENT FLIGHT RULES**

IFR CONDITIONS - Weather conditions that require aircraft to be operated in accordance with instrument flight rules.

IFR MINIMUMS AND DEPARTURE PROCEDURES (FAR PART 91) - Prescribed takeoff rules. For some airports, obstructions or other factors require the establishment of nonstandard takeoff minimums or departure procedures, or both. Both may be required to assist pilots in avoiding obstacles during climb to the minimum en-route altitude.

ILS - See **INSTRUMENT LANDING SYSTEM**.

ILS CATEGORIES -

1. ILS Category I – An ILS approach procedure, which provides for approach to a height above touchdown of not less than 200 feet and with runway visual range of not less than 1,800 feet.
2. ILS Category II – An ILS approach procedure which provides for approach to a height above touchdown of not less than 100 feet and with runway visual range of not less than 1,200 feet.
3. ILS Category III.
 - a. IIIA – An ILS approach procedure, which provides for approach without a decision height minimum and with runway visual range of not less than 700 feet.
 - b. IIIB – An ILS approach procedure, which provides for approach without a decision height minimum and with runway visual range of not less than 150 feet.
 - c. IIIC – An ILS approach procedure, which provides for approach without a decision height minimum and without runway visual range minimum.

IMPACT - In environmental and noise control studies, the word “impact” is used to express the extent or severity of an environmental problem, e.g., the number of persons exposed to a given noise environment. As indicated in CEQ 1500 (Section 1508.8), impacts and effects are considered to be synonymous. Effects or impacts may be ecological, aesthetic, historic, cultural, economic, social, or health related, and they may be direct, indirect, or cumulative.

IMPACT INSULATION CLASS (IIC) - A single-figure rating that is intended to permit comparisons of the sound-insulating merits of floor-ceiling assemblies in terms of a reference contour.

INCOMPATIBLE LAND USE - Residential, public, recreational and certain other noise-sensitive land uses which are designated as unacceptable within specific ranges of cumulative (Ldn) noise exposure as set forth in Table 2 of Appendix A of FAR Part 150.

INSTRUMENT APPROACH PROCEDURE - A series of predetermined maneuvers for the orderly transfer of an aircraft under instrument flight conditions from the beginning of the initial approach to a landing or to a point from which a landing may be made visually. It is prescribed and approved for a specific airport by competent authority.

INSTRUMENT FLIGHT RULES (IFR) - Rules specified by the FAA for flight under weather conditions in which visual reference cannot be made to the ground and the pilot must rely on instruments to fly and navigate.

INSTRUMENT LANDING SYSTEM (ILS) - An electronic system, which provides the aircraft with lateral, longitudinal and vertical guidance necessary for an instrument landing.

INSTRUMENT OPERATION - An aircraft operation in accordance with an IFR flight plan or an operation where IFR separation between aircraft is provided by a terminal traffic control facility.

INSTRUMENT RUNWAY - A runway equipped with electronic and visual navigation aids for which a precision or non-precision approach procedure having straight-in landing minima has been approved.

INVERSE SQUARE LAW - Describes the reduction in sound pressure where the mean square sound pressure changes in inverse proportion to the square of the distance from the source. Under this ideal condition, the sound pressure level decreases 6dB with each doubling of distance from the source.

ITINERANT OPERATION - An arrival or departure performed by an aircraft from or to a point beyond the local airport area. Also defined as all aircraft arrivals and departures other than local operations.

LAND USE COMPATIBILITY - The compatibility of land uses surrounding an airport with airport activities and particularly with the noise from aircraft operations.

LAND USE COMPATIBILITY ASSURANCE - Documentation provided by an airport sponsor to the FAA. The documentation is related to an application for an airport development grant. Its purpose is to assure that a reasonably appropriate action, including the adoption of zoning laws, has been taken or will be taken to restrict the use of land adjacent to the airport or in the immediate vicinity of the airport. Such uses are limited to activities and purposes compatible with normal airport operations, including the landing and takeoff of aircraft. This assurance is required of airport sponsors by Section 511 (a) (5) of the Airport and Airway Improvement Act of 1981. (Also see AIP Program.)

LAND USE CONTROLS - Controls established by local or state governments to carry out land use planning. The controls include zoning, subdivision regulations, land acquisition (in fee simple, lease-back, or easements), building codes, building permits, and capital improvement programs (or provide sewer, water, utilities, or other service facilities).

LAND USE PLANNING - Comprehensive planning carried out by units of local government, for all areas under their jurisdiction, to identify the optimum uses of land and to serve as a basis for the adoption of zoning or other land use controls.

LARGE AIRCRAFT - An aircraft of more than 12,500 pounds maximum certificated takeoff weight, up to 300,000 pounds.

L_{dn} - See **DAY-NIGHT AVERAGE SOUND LEVEL**

L_{max} - The maximum A-weighted noise level recorded during a noise event.

LEAD AGENCY - In California, the public agency that has the principal responsibility for carrying-out or approving a project. The Lead Agency will decide whether an EIR or Negative Declaration will be required for the project and will cause the document to be prepared. Criteria for determining which agency will be the Lead Agency for a project are contained in Section 15051 of the CEQA guidelines.

Leq - See **EQUIVALENT ENERGY LEVEL, Leq**

LESS-THAN-FEE ACQUISITION (PURCHASE) - The purchase of development rights (see also) from landowners by airport sponsors in areas that should remain at very low densities or in open space uses. The airport sponsor negotiates with the landowner to determine the fair market value of the unused development rights. Once sold, the land cannot be developed except in specified ways. (See also **FEE-SIMPLE m LAND ACQUISITION**.)

L_{max} - See **MAXIMUM A-WEIGHTED NOISE LEVEL**

LOC - See **LOCALIZER**.

LOCAL AGENCY - In California, any public agency other than a state agency, board, or commission. "Local Agency" includes but is not limited to cities, counties, charter cities and counties, districts, school districts, special districts, redevelopment agencies, local agency formation commissions, and any board, commission, or organizational subdivision of a local agency when so designated by order or resolution of the governing legislative body of the local agency.

LOCAL OPERATION - An aircraft operation which remains no more than 25 nautical miles from the departure point, or which terminates at the point of departure, or which does not include a stop of a greater duration than 15 minutes. Touch-and-go operations are local operations.

LOCAL TRAFFIC - Aircraft operating in the traffic pattern or within sight of the tower, or aircraft known to be departing or arriving from flight in local practice areas, or aircraft executing practice instrument approaches at the airport.

LOCALIZER (LOC) - The component of an ILS, which provides horizontal course guidance to the runway.

LOCALIZER TYPE DIRECTIONAL AID (LDA) - A NAVAID used for non-precision instrument approaches with utility and accuracy comparable to a localizer, but which is not part of a complete ILS and is not aligned with the runway.

LOUDNESS - The judgment of the intensity of a sound by a person. Loudness depends primarily on the sound pressure of the stimulus. Over much of the loudness range it takes about a tenfold increase in sound pressure (approximately 10 decibels) to produce a doubling of loudness.

LOW APPROACH - An approach over an airport or runway following an instrument approach or a VFR approach including the go-around maneuver where the pilot intentionally does not make contact with the runway.

MAJOR AIRPORT DEVELOPMENT - Airport development of such a scale as to require shifts in patterns of population movement and growth, public service demands, and changes in business and economic activity.

MARKER BEACON - The component of an ILS, which informs pilots that they are at a significant point on the approach course.

MASKING - The action of making one sound (audible when heard alone) inaudible or unintelligible by the introduction of another sound. The masking is most marked when the masked sound is of higher frequency than the masking sound.

MEAN SEA LEVEL (MSL) - An elevation datum given in feet above mean sea level.

MICROWAVE LANDING SYSTEM (MLS) - An advanced electronic system of ground-based devices and aircraft avionics, which provides the aircraft with lateral, longitudinal and vertical guidance necessary for an instrument landing. In the U.S., MLS technology has been supplanted by GPS (which see).

MILITARY OPERATION - Operations performed by military groups, such as the Air National Guard, the U.S. Air Force, U.S. Army, U.S. Marine Corps, or the U.S. Navy.

MILITARY OPERATIONS AREA (MOA) - A type of special use airspace established to separate certain military activities from IFR traffic and to identify for VFR traffic where these activities are conducted.

MINIMUM DESCENT ALTITUDE (MDA) - The lowest altitude, expressed in feet above mean sea level, to which descent is authorized on final approach or during circle-to-land maneuvering in execution of a standard instrument approach procedure where no electronic glide slope is provided.

MINIMUM SAFE ALTITUDE - The minimum altitude specified in Part 91 for various aircraft operations.

MINIMUMS - Weather condition requirements established for a particular operation or type of operation; e.g., IFR takeoff or landing, alternate airport for IFR flight plans, VFR flight, etc.

MISSED APPROACH –

1. A maneuver conducted by a pilot when an instrument approach cannot be completed to a landing. The route of flight and altitude are shown on instrument approach procedure charts. A pilot executing a missed approach prior to the Missed Approach Point (MAP) must continue along the final approach to the MAP. The pilot may climb immediately to the altitude specified in the missed approach procedure.
2. A term used by the pilot to inform ATC that he is executing the missed approach.
3. At locations where ATC radar service is provided, the pilot should confirm to radar vectors when provided by ATC in lieu of the published missed approach procedure.

MITIGATION MEASURE - An action that can be planned or taken to alleviate (mitigate) an adverse environmental impact. As set forth in CEQ 1500 (Section 1508.20), “mitigation” includes:

- (a) Avoiding the impact altogether by not taking a certain action or parts of an action.
- (b) Minimizing the impact by limiting the degree or magnitude of the action and its implementation.
- (c) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
- (d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.

- (e) Compensating for the impact by replacing or providing substitute resources or environments.

A proposed airport development project, or alternatives to that project, may constitute a mitigation measure as defined by the CEQ. CEQA contains a similar definition of mitigation measure (Cal. Pub. Res. Code 21002, et seq.).

MLS - See **MICROWAVE LANDING SYSTEM**

MSL - See **MEAN SEA LEVEL**

NATIONAL AIRSPACE SYSTEM/NAS - The common network of U.S. airspace; air navigation facilities, equipment and services, airports or landing areas; aeronautical charts, information and services; rules, regulations and procedures, technical information, and manpower and material. Included are system components shared jointly with the military.

NAVAID - See **NAVIGATIONAL AID**

NAVIGATIONAL AID (NAVAID) - Any visual or electronic device (airborne or on the ground) that provides point-to-point guidance information or position data to pilots of aircraft in flight.

NDB - See **NONDIRECTIONAL RADIO BEACON (NDB)**

NEPA - National Environmental Policy Act of 1969 (PL 91-190).

NOISE - Any sound or signal that is undesirable because it interferes with speech and hearing, or is intense enough to damage hearing, or is otherwise annoying.

NOISE ABATEMENT PROCEDURES - Changes in operational procedures affecting runway use, in flight approach and departure routes and procedures, and in other air traffic procedures that are made to shift adverse aviation effects away from noise-sensitive areas (such as residential neighborhoods).

NOISE ATTENUATION OF BUILDINGS - The use of building materials to reduce noise through absorption, transmission loss, and reflection of sound energy.

NOISE COMPLAINT - A recorded complaint concerning aircraft noise made by an individual and kept on file at an airport.

NOISE CONTOURS - Lines drawn on a map that connect points of equal noise exposure (Ldn or CNEL) values. They are usually drawn in 5-dB intervals, such as Ldn 75 dB values, Ldn 70 dB values, Ldn 65 dB values, and so forth.

NOISE CONTROL PLANS - Documentation by the airport sponsor of actions to be taken by the sponsor to reduce the effect of aviation noise. These actions are to be taken by the sponsor either alone or in cooperation with the FAA, airport users, and affected units of local government, with appropriate comments from affected citizens. Alternative actions should be considered, particularly where proprietary use restrictions (see also) on aircraft operations are involved).

NOISE LEVEL REDUCTION (NLR) - The noise reduction between indoor and outdoor environments of two rooms is the numerical difference, in decibels, of the average sound pressure levels in those areas or rooms. A measurement of “noise level reduction” combines the effect of the transmission loss performance of the structure plus the effect of acoustic absorption present in the receiving room.

NOISE-SENSITIVE LAND USE - Land uses that can be adversely affected by high levels of aircraft noise. Residences, schools, hospitals, religious facilities, libraries, and other similar uses are often considered to be sensitive to noise.

NONCOMPATIBLE LAND USE - See **INCOMPATIBLE LAND USE**.

NONDIRECTIONAL RADIO BEACON (NDB) - A low or medium frequency 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 “home” on or track to or from the station.

NONPRECISION APPROACH PROCEDURE - A standard instrument approach procedure in which no electronic glideslope is provided, such as VOR, GPS, or LOC (which “see”).

NONPRECISION INSTRUMENT RUNWAY - A runway with an instrument approach procedure utilizing air navigation facilities, with only horizontal guidance, or area-type navigation equipment for which a straight-in non-precision instrument approach procedure has been approved or planned, and no precision approach facility or procedure is planned.

NOTAM - See **NOTICE TO AIRMEN**

NOTICE TO AIRMEN - A notice containing information (not known sufficiently in advance to publicize by other means) concerning the establishment, condition, or change in any component (facility, service, or procedure of, or hazard in the National Airspace System) the timely knowledge of which is essential to personnel concerned with flight operations.

OBSTACLE - An existing object, object of natural growth, or terrain, at a fixed geographical location, or which may be expected at a fixed location within a prescribed area, with reference to which vertical clearance is or must be provided during flight operation.

OBSTACLE FREE ZONE (OFZ) - A volume of space above and adjacent to a runway and its approach lighting system if one exists, free of all fixed objects except FAA-approved frangible aeronautical equipment and clear of vehicles and aircraft in the proximity of an airplane conducting an approach, missed approach, landing, takeoff, or departure.

OBSTRUCTION - An object that exceeds a limiting height or penetrates an imaginary surface described by current Federal Aviation Regulations (Part 77).

OPERATION - A take-off or a landing.

ORDER - See **FAA ORDER**.

OUTER MARKER - A marker beacon at or near the glide slope intercept position of an ILS approach.

PAPI - See **PRECISION APPROACH PATH INDICATOR**

PILOT IN COMMAND - The pilot responsible for the operation and safety of an aircraft during flight time.

POLYGON - An irregular geometric figure, encoded into a computer database, coincident with the physical conterminous boundaries of a single land use category. Individual polygons are encoded into a computer database using a process termed “digitizing.”

PRECISION APPROACH PATH INDICATOR (PAPI) - An airport landing aid similar to a VASI, but which has light units installed in a single row rather than two rows.

PRECISION APPROACH PROCEDURE – A standard instrument approach procedure in which an electronic glideslope/glidepath is provided; e.g., ILS/MLS and PAR.

PRECISION INSTRUMENT PROCEDURE - A standard instrument procedure for an aircraft to approach an airport in which an electronic glide slope is provided, e.g., an instrument landing system (ILS) or military precision approach radar.

PRECISION INSTRUMENT RUNWAY - A runway with an instrument approach procedure utilizing an instrument landing system (ILS), microwave landing system (MLS), precision approach radar (PAR), or GPS.

PREFERENTIAL RUNWAY USE (PROGRAM) - A noise abatement action whereby the FAA Air Traffic Division, in conjunction with the FAA Airports Division, assists the airport sponsor in developing a program that gives preference to the use of a specific runway(s) to reduce overflight of noise-sensitive areas.

PROPRIETARY USE RESTRICTIONS - Restrictions by an airport sponsor on the number, type, class, manner, or time of aircraft operations at the airport. The imposition of a curfew is an example of a proprietary use restriction.

PUBLIC AGENCY - In California, includes any state agency, board, or commission and any local or regional agency, as defined in the CEQA guidelines. It does not include the courts of the state. The term does not include agencies of the federal government.

RADAR APPROACH CONTROL FACILITY - A terminal ATC facility that uses radar and non-radar capabilities to provide approach control services to aircraft arriving, departing, or transiting airspace controlled by the facility. Provides radar ATC services to aircraft operating in the vicinity of one or more civil and/or military airports in a terminal area. Specific facility nomenclatures are used for administrative purposes only and are related to the physical location of the facility and the operating service generally as follows:

- › Army Radar Approach Control/ARAC (Army),
- › Radar Air Traffic Control Facility/RATCF (Navy/FAA),
- › Radar Approach Control/RAPCON (Air Force/FAA),

- › Terminal Radar Approach Control/TRACON (FAA),
- › Tower/Airport Traffic Control Tower/ATCT (FAA) [only those towers delegated approach control authority].

REIL - See **RUNWAY END IDENTIFIER LIGHTS**

RELIEVER AIRPORT - An airport serving general aviation aircraft that might otherwise use a congested air carrier airport.

RESPONSIBLE AGENCY - In California, a public agency which proposes to carry out or approve a project, for which a Lead Agency is preparing or has prepared an EIR or Negative Declaration. For purposes of CEQA, the term “Responsible Agency” includes all public agencies other than the Lead Agency, which have discretionary approval power over the project.

RESTRICTED AREA - Designated airspace within which the flight of aircraft, while not wholly prohibited, is subject to restriction.

RETROFIT - The retroactive modification of existing jet aircraft engines for noise abatement purposes.

RUNWAY - A defined rectangular area on a land airport prepared for the landing and takeoff run of aircraft along its length. Runways are normally numbered in relation to their magnetic direction rounded off to the nearest 10 degrees; e.g., Runway 01, Runway 25.

RUNWAY EDGE LIGHTS - Lights used to define the lateral limits of a runway.

RUNWAY END IDENTIFIER LIGHTS (REILs) - Two synchronized flashing lights, one on each side of the runway threshold, which provide a pilot with a rapid and positive visual identification of the approach end of a particular runway.

RUNWAY HEADING - The magnetic direction indication by the runway number. When cleared to “fly/maintain runway heading,” pilots are expected to comply with the ATC clearance by flying the heading indicated by the runway number without applying any drift correction; e.g., Runway 4, 040^o magnetic heading; Runway 20, 200^o magnetic heading.

RUNWAY PROTECTION ZONE - A trapezoidal area at ground level whose perimeter conforms to the projection on the ground of the innermost portion of the Approach Surface as defined in FAR Part 77. The runway protection zone is centered on the extended runway centerline and begins at the end of the FAR Part 77 Primary Surface, terminating below the line where the Approach Surface reaches a height of 50 feet above the elevation of the runway end. FAA regulations require that runway protection zones be kept free of obstructions and any uses that cause an assemblage of persons.

RUNWAY SAFETY AREA - A cleared, drained, graded, and preferably turfed area symmetrically located about the runway which, under normal conditions, is capable of supporting snow removal, fire fighting, and rescue equipment and of accommodating the occasional passage of aircraft without causing major damage to the aircraft.

RUNWAY THRESHOLD - The beginning of that portion of a runway usable for landing or takeoff. (See also **DISPLACED THRESHOLD**.)

RUNWAY USE PROGRAM - See **PREFERENTIAL RUNWAY USE PROGRAM**

SEL – See **SOUND EXPOSURE LEVEL (SEL)**

SEVERE NOISE EXPOSURE - Exposure to aircraft noise that is likely to interfere with human activity in noise-sensitive areas; repeated vigorous complaints can be expected and group action is probable. This exposure may be specified by a cumulative noise descriptor as a level of noise exposure, such as the Ldn (or CNEL) 75 dB level. (See also **SIGNIFICANT NOISE EXPOSURE**.)

SHIELDING - The attenuation of a sound by placing walls, buildings, plants, or other barriers between a sound source and the receiver.

SIGNIFICANT ENVIRONMENTAL EFFECT - A significant effect on the environment is a substantial or potentially substantial adverse change in the physical conditions of the area affected by a project.

SIGNIFICANT NOISE EXPOSURE - Exposure to aircraft noise that is likely to interfere with human activity in noise-sensitive areas; individual complaints may be expected and group action is possible. This exposure may be specified by a cumulative noise descriptor as a level of noise exposure, such as the Ldn (or CNEL) 65 dB level. (See also **SEVERE NOISE EXPOSURE**.)

SMALL AIRCRAFT - Aircraft of 12,500 pounds or less maximum certificated takeoff weight.

SOUND EXPOSURE LEVEL (SEL) – The level of noise accumulated during a single noise event, such as an aircraft overflight, with reference to a duration of one second. More specifically, it is the level of time-integrated A-weighted squared sound pressure for a stated time interval or event, based on the reference pressure of 20 micronewtons per square meter and reference duration of one second.

SOUND INSULATION - (1) The use of structures and materials designed to reduce the transmission of sound from one room or area to another, or from the exterior to the interior of a building, (2) the degree of reduction in sound transmission by means of sound insulating structures and materials.

SOUND LEVEL (NOISE LEVEL) - The weighted sound pressure level obtained by the use of a sound level meter having a standard frequency filter for attenuating or accentuating part of the sound spectrum.

SOUND LEVEL METER - An instrument, comprising a microphone, an amplifier, an output meter, and frequency weighting networks, that is used to measure noise and sound levels in a specified manner.

SOUND TRANSMISSION CLASS (STC) - The preferred single figure rating system designed to give an estimate of the sound insulation properties of a partition or a rank ordering of a series of

partitions. It is intended for use primarily when speech and office noise constitute the principal noise problem.

SOUND TRANSMISSION LOSS - A measure in decibels of sound insulation provided by a structural configuration.

SPECIAL USE AIRSPACE - Airspace of defined horizontal and vertical dimensions wherein activities must be confined because of their nature and/or wherein limitations may be imposed upon aircraft operations that are not a part of those activities.

SPECIAL VFR CONDITIONS - Meteorological conditions that are less than those required for basic VFR flight in Class B, C, D, or E surface areas and in which some aircraft are permitted flight under visual flight rules.

SPECIAL VFR OPERATIONS - Aircraft operating in accordance with clearances within Class B, C, D, and E surface areas in weather conditions less than the basic VFR weather minima. Such operations must be requested by the pilot and approved by ATC.

STANDARD - A specific statement by an authority of permitted environmental conditions.

STANDARD INSTRUMENT DEPARTURE (SID) - A pre-planned instrument flight rules (IFR) air traffic control departure procedure printed for pilot use in graphic and/or textual form. SIDs provides transition from the terminal to the appropriate en route structure.

STANDARD TERMINAL ARRIVAL ROUTE (STAR) - A pre-planned instrument flight rules (IFR) air traffic control arrival route published for pilot use in graphic and/or textual form. STARS provide transition from the en route structure to an outer fix or an instrument approach fix/arrival waypoint in the terminal area.

STOPWAY - An area beyond the takeoff runway, no less wide than the runway and centered upon the extended centerline of the runway, able to support the aircraft during an aborted takeoff, without causing structural damage to the aircraft, and designated by the airport authorities for use in decelerating the aircraft during an aborted takeoff.

STRAIGHT-IN INSTRUMENT APPROACH - An instrument approach wherein final approach is begun without first having executed a procedure turn; it is not necessarily completed with a straight-in landing or made to straight-in landing weather minima.

SUBDIVISION REGULATIONS (ORDINANCE) - Regulations promulgated by local governments to guide development in defined ways and by prescribed methods to control the use of private land in the public interest. Subdivision regulations were initially established to prevent (1) the uncontrolled subdivisions of land that often left communities without adequate streets, water mains, or sewers, and (2) disorderly, chaotic growth - urban sprawl.

SUBSTANTIAL EVIDENCE - Under CEQA, if there is substantial evidence that a project may have a significant environmental effect, an EIR must be prepared. Substantial evidence includes facts, reasonable assumptions based on facts, and expert opinions supported by facts. The following are *not* substantial evidence: argument, speculation, unsubstantiated opinion or narrative, clearly

inaccurate or erroneous information, or evidence of social or economic impacts that do not contribute to, or are not caused by, physical impacts on the environment.

TAXI - The movement of an airplane under its own power on the surface of an airport. Also, it describes the surface movement of helicopters equipped with wheels.

TAXILANE - The portion of the aircraft parking area used for access between taxiways, aircraft parking positions, hangars, storage facilities, etc.

TAXIWAY - A defined path, from one part of an airport to another, selected or prepared for the taxiing of aircraft.

TERMINAL AIRSPACE - See **TERMINAL AREA**.

TERMINAL AREA - A general term used to describe airspace in which approach control service or airport traffic control service is provided.

TERMINAL INSTRUMENT PROCEDURES (TERPS) - Procedures for instrument approach and departure of aircraft to and from civil and military airports. There are four types of terminal instrument procedures: (1) precision approach, (2) non-precision approach, (3) circling, and (4) departure.

TERPS - Terminal Instrument Procedures.

THRESHOLD - The beginning of that portion of the runway usable for landing.

TOUCH-AND-GO OPERATION - A practice maneuver consisting of a landing and a takeoff performed in one continuous movement—the aircraft lands and begins takeoff roll without stopping. A touch-and-go is considered as two operations.

TOWER - See **AIRPORT TRAFFIC CONTROL TOWER (ATCT)**.

TRAFFIC PATTERN - The traffic flow that is prescribed for aircraft landing at, taxiing on, or taking off from an airport. The components of a typical traffic pattern are upwind leg, crosswind leg, downwind leg, base leg, and final approach.

1. Upwind Leg – A flight path parallel to the landing runway in the direction of landing.
2. Crosswind Leg – A flight path at right angles to the landing runway off its upwind end.
3. Downwind Leg – A flight path parallel to the landing runway in the direction opposite to landing. The downwind leg normally extends between the crosswind leg and the base leg.
4. Base Leg – A flight path at right angles to the landing runway off its approach end. The base leg normally extends from the downwind leg to the intersection of the extended runway centerline.
5. Final Approach – A flight path in the direction of landing along the extended runway centerline. The final approach normally extends from the base leg to the runway. An aircraft making a straight-in approach VFR is also considered to be on final approach.

TRANSFER OF DEVELOPMENT RIGHTS (TDR) - TDR involves separate ownership and use of the various rights associated with a parcel of real estate. Under the TDR concept, some of the property's development rights (see also) are transferred to another location where they may be used to intensify allowable development. For example, lands within an area affected by aircraft noise could be kept in open space or agricultural uses, and development rights for residential or other uses could be transferred to locations outside the area. Landowners could be compensated for the transferred rights by their sale at the new locations, or the airport could purchase the rights. Depending on market conditions and legal requirements, the airport could either hold or resell the rights.

TRANSIENT AIRCRAFT - Aircraft not based at the airport.

TRANSITIONAL AIRSPACE - That portion of controlled airspace wherein aircraft change from one phase of flight or flight condition to another.

TRANSMISSOMETER - An apparatus used to measure runway visibility on an ILS runway.

TRANSPORT AIRPORT - An airport designed, constructed, and maintained to serve airplanes having approach speeds of 121 knots or more.

TURBOJET AIRCRAFT - An aircraft having a jet engine in which the energy of the jet operates a turbine, which in turn operates the air compressor.

TURBOPROP AIRCRAFT - An aircraft having a jet engine in which the energy of the jet operates a turbine, which drives the propeller.

UNICOM (Aeronautical Advisory Station) - A non-government air/ground radio communication facility, which may provide airport information (winds, weather, etc.) at specific airports.

UTILITY AIRPORT - An airport designed, constructed, and maintained to serve airplanes having approach speeds less than 121 knots.

URBAN GROWTH MANAGEMENT (UGM) - The identification and management of the demands on municipal facilities, improvements or services created by any proposed residential, commercial, industrial, or other type of development. UGM is intended to (1) provide the means for satisfying such demands, (2) identify any harmful effects of development, and (3) protect the jurisdictions and their residents against such harmful effects by minimizing the costs of municipal facilities, improvements, and services. The intent of UGM is usually not to prevent development or growth, but rather to avoid free or disorganized development or growth in the UGM area, which is generally located in and around the fringe of an urban area. The UGM area usually is either relatively undeveloped or predominantly agricultural and lacks most, if not all, municipal facilities, improvements, or services.

ULTRALIGHT VEHICLE - An aeronautical vehicle operated for sport or recreational purposes, which does not require FAA registration, an airworthiness certificate, or pilot certification. They are primarily single-occupant vehicles, although some two-place vehicles are authorized for training purposes. Operation of an ultralight vehicle in certain airspace requires authorization from ATC.

VASI - See **VISUAL APPROACH SLOPE INDICATOR**

VECTOR - A heading issued to a pilot to provide navigational guidance by radar.

VERY HIGH FREQUENCY (VHF) OMNIDIRECTIONAL RANGE (VOR) - The standard navigational aid used throughout the airway system to provide bearing information to aircraft. When combined with Tactical Air Navigation (TACAN) the facility, called VORTAC, provides distance as well as bearing information.

VFR - See **VISUAL FLIGHT RULES**

VFR CONDITIONS - Weather conditions that permit aircraft to be operated in accordance with visual flight rules.

VICTOR AIRWAY - A control area or portion thereof established in the form of a corridor, the centerline of which is defined by VOR's.

VISIBILITY - The ability, as determined by atmospheric conditions and expressed in units of distance, to see and identify prominent unlighted objects by day and prominent lighted objects by night. Visibility is reported as statute miles, hundreds of feet or meters.

1. *Flight Visibility*. The average forward horizontal distance, from the cockpit of an aircraft in flight, at which prominent unlighted objects may be seen and identified by day and prominent lighted objects may be seen and identified by night.
2. *Ground Visibility*. Prevailing horizontal visibility near the earth's surface as reported by the United States National Weather Service or an accredited observer.

VISUAL APPROACH - An approach to an airport wherein an aircraft on an IFR flight plan, operating in VFR conditions under the control of a radar facility and having an air traffic control authorization, may deviate from the prescribed instrument approach procedure and proceed to the airport of destination, served by an operational control tower, by visual reference to the surface.

VISUAL APPROACH SLOPE INDICATOR (VASI) - An airport landing aid, which provides a pilot with visual descent (approach slope) guidance while on approach to landing. See also **PAPI**.

VISUAL FLIGHT RULES (VFR) - Rules that govern the procedures for conducting flight under visual conditions (Federal Aviation Regulations, Part 91).

VISUAL RUNWAY - A runway intended solely for the operation of aircraft using visual approach procedures, with no straight-in instrument approach procedure and no instrument designation indicated on an FAA-approved airport layout plan.

VOR - See **VERY HIGH FREQUENCY OMNIDIRECTIONAL RANGE**

WAKE TURBULENCE - Phenomena resulting from the passage of an aircraft through the atmosphere. The term includes vortices, thrust stream turbulence, jet blast, jet wash, propeller wash, and rotor wash both on the ground and in the air.

WARNING AREA - Airspace that may contain hazards to non-participating aircraft in international airspace.

WIND SHEAR - A change in wind speed and/or wind direction in a short distance resulting in a tearing or shearing effect. It can exist in a horizontal or vertical direction and occasionally in both.

ZONING AND ZONING ORDINANCES - Ordinances that divide a community into zones or districts according to the present and potential use of properties for the purpose of controlling and directing the use and development of those properties. Zoning is concerned primarily with the use of land and buildings, the height and bulk of buildings, the proportion of a lot that buildings may cover, and the density of population of a given area. As an instrument of plan implementation, zoning deals principally with the use and development of privately owned land and buildings. The objective of zoning legislation is to establish regulations that provide locations for all essential uses of land and buildings and to ensure that each use is located in the most appropriate place. In FAR Part 150 planning, zoning can be used to achieve two major aims: (1) to reinforce existing compatible land uses and promote the location of future compatible uses in vacant or undeveloped land, and (2) to convert existing non-compatible uses to compatible uses over time.

Pilot User Survey**NAPA COUNTY AIRPORT MASTER PLAN UPDATE**

March 20, 2002

*86 Responses Received***1. Association with Napa County Airport:**

Based	97%
Transient	3%

2. What type of aircraft do you normally fly?

Single-engine airplane, fixed-pitch prop	34%
Single-engine airplane, variable-pitch prop	52%
Twin-engine airplane	10%
Jet airplane	4%
Helicopter	0%
Other (specify)	0%

3. Where do you normally park your aircraft at the Napa County Airport?

Based tiedown	9%
Visitor parking	1%
Hangar	90%

4. What are the purposes of your flights to/from Napa County Airport:

<i>Company business</i>		<i>Pleasure/recreation</i>	
0%	59%	0%	17%
1-25%	15%	1-25%	9%
26-50%	9%	26-50%	12%
51-75%	5%	51-75%	8%
76-100%	8%	76-100%	51%
<i>Personal business</i>		<i>Flight training</i>	
0%	59%	0%	78%
1-25%	17%	1-25%	21%
26-50%	10%	26-50%	0%
51-75%	3%	51-75%	0%
76-100%	15%	76-100%	0%

5. What is the one-way driving time to or from Napa County Airport (in minutes)?

<15 minutes	46%
15-30 minutes	34%
31-60 minutes	8%
>60 minutes	5%
No response	7%

6. How do the following factors affect your selection of Napa County Airport as a base or destination airport?

<i>Close to home/friend/relative</i>		<i>Reasonable fuel prices</i>	
Discourages Use	3%	Discourages Use	53%
Encourages Use	20%	Encourages Use	22%
Strongly Encourages Use	64%	Strongly Encourages Use	7%
Not a factor	11%	Not a factor	16%
<i>Close to business</i>		<i>Friendly atmosphere</i>	
Discourages Use	4%	Discourages Use	4%
Encourages Use	17%	Encourages Use	44%
Strongly Encourages Use	30%	Strongly Encourages Use	31%
Not a factor	47%	Not a factor	18%
<i>Good aircraft security</i>		<i>Easy to fly to/from airport</i>	
Discourages Use	3%	Discourages Use	6%
Encourages Use	45%	Encourages Use	34%
Strongly Encourages Use	28%	Strongly Encourages Use	52%
Not a factor	22%	Not a factor	7%
<i>Good FBO services</i>		<i>Good runway/taxiway system</i>	
Discourages Use	20%	Discourages Use	3%
Encourages Use	42%	Encourages Use	45%
Strongly Encourages Use	13%	Strongly Encourages Use	44%
Not a factor	24%	Not a factor	5%
<i>Good pilots' facilities</i>		<i>Good ATC system</i>	
Discourages Use	13%	Discourages Use	2%
Encourages Use	28%	Encourages Use	37%
Strongly Encourages Use	14%	Strongly Encourages Use	49%
Not a factor	32%	Not a factor	10%
<i>Reasonable tiedown/hangar rates</i>		<i>Instrument approaches</i>	
Discourages Use	20%	Discourages Use	10%
Encourages Use	44%	Encourages Use	33%
Strongly Encourages Use	23%	Strongly Encourages Use	23%
Not a factor	12%	Not a factor	32%

7. Percentages of people who feel the following facilities and services need improvement:

RUNWAY/TAXIWAY SYSTEM

Length of main runway (Runway 36L-18R)	10%
Length of parallel runway (Runway 36R-18L)	15%
Length of crosswind runway (Runway 6-24)	13%
Instrument approach capability	56%
Obstruction lighting	13%
Taxiway lighting	11%
Runway/taxiway markings and signs	21%
Runup areas	9%

AIRCRAFT FACILITIES

Number of hangars	67%
Size/condition/cost of hangars	46%
Number of tiedowns	7%
Apron pavement condition	10%
Apron lighting	14%
Security fencing	29%

AUTOMOBILE FACILITIES

Number of parking spaces	30%
Parking area condition	22%
Directional signs on access roads	27%

OTHER FACILITIES/SERVICES

Fuel service	40%
Air traffic control	10%
Weather observation/reporting	13%
Aircraft maintenance/repair	43%
Other FBO services	34%
Pilots' facilities (lounge/restrooms, etc.)	20%
Security presence	38%
Automobile rental	28%
Taxi service or public transportation	31%
Public use heliport	14%

8. Specific suggestions for the improvement/enhancement of the operation, procedures, facilities, and services at Napa County Airport:

The following responses present verbatim transcriptions of survey comments. The responses are listed in the order in which they were received.

- Should have restrooms near hangars.
- Self-service fueling should be provided by County. FBO's fuel prices are way out of line. I buy 100LL at Visalia 50¢/gallon cheaper. We need a self-service facility.
- Lower hangar prices.
- Suggest long-term land leases to individuals for private hangars. I had to wait 7 years on a list to get hangar.
- Need better lighting in older hangars, also some way to stop encroaching sand and grit from entering hangars.
- More FBO and fuel choices.
- Add glidescope, avionics shop.
- Correct the hangar rates to include hangar conditions. Items to consider are vapor barrier in concrete, lighting seals on door, controllable ventilation. These are on the new hangars, but not old ones. Rates reflect only square footage.
- I am unhappy with the cost of fuel. I do not like the County having a hand in setting the price.
- How about a card lock self fuel?
- Self service fuel.
- Radio shop needed. Better wiring in T-hangars – the outlets are wired with undersize wire, resulting in large voltage drops. My outlet will not power a compressor. Close the tower, it is not needed and merely slows down the traffic flow. Many times I have been told to hold short when there is actually plenty of time to depart ahead of the landing traffic.
- Need an ILS. Great airport manager.
- The hangar row that I'm in should be re-roofed or sealed as they leak severely in the rain. Some of the paving is in poor shape around the hangar.
- Avionics shop is needed. Some competition for FBO and fuel would bring down costs (60¢ difference between APC and Rio Vista for fuel).
- FBO needs competition.
- Really need to upgrade maintenance capabilities. More hangars, avionics facility, upgrade maintenance expertise and turnaround time. Would like to relocate to Angwin - build more hangars there.
- Could use ILS approach. We have very few complaints. Enjoy the airport. We want a full hangar, so build more of them. Good job.
- Need to do more to encourage general aviation (light aircraft) and more of a choice for aircraft maintenance.
- FBO, Bridgeford Aviation is gouging on fuel, e.g., recent price for 100LL = \$2.69/gallon vs. \$2.45/gallon at Angwin (203) and \$2.09/gallon at Rio Vista (088)
- The installation of a self-serve fuel pit would be helpful.
- Full instrument approach should be provided.
- Create a stand-alone airport agency separate from other County entities as an enterprise agency.
- We used to have taxi-up fuel service which I thought was more efficient and less costly. Also more EPA friendly.
- We need a glidescope (full ILS).

- Need to restore ops on Runway 6-24. Runway 18-36 has 90° crosswinds, often >15 knots. Exceeds airport capability.
- Fix Runway 6-24 today.
- I would like to see all funds generated by airport activity be used only for airport capital and continuing operations. Supervisors of Napa County should take users wishes seriously!
- ILS installation. Large hangars.
- Fuel prices are the highest in the area. Old hangars rent too high – they leak, one light door is hard to operate.
- More hangars.
- Turn the hot water heater on again in the south hangars.
- Needs an ILS. Cheaper JetA and 100LL. You are one of the highest in the County. Another FBO.
- A 36L precision approach, localizer, and glidescope.
- ILS installation.
- Need larger, single hangars: 45 x 40' (for warbirds and twins).
- Should be a more aggressive means for keeping birds away from runways and taxiways. Install an ILS for 36.
- As is true for many, I would appreciate access to a hangar. I have been on the waiting list for over 3 years.
- Bridgeford should improve service (at conclusion of annual or oil change should clean A/C).
- Typical government run operation. Non-responsive to local pilots. The County and the FBO love those big jets. An individual has to be dedicated to flying to continue at Napa.
- Install an ILS.
- Been all the way to east coast, Bridgeford FBO service worst in USA. Maintenance is a liability.
- If the County or FBO would put in some carded fuel pumps, perhaps we could get cheaper fuel. Perhaps we could get automotive grade, and perhaps all the good old boys wouldn't fly off to Nut Tree or Rio Vista for cheaper fuel.
- Bridgeford needs competition for rental fuel and training.
- 1. Install radar. 2. Put 6-24 back into service. 3. Build more T-hangars. 4. Improve IFR procedures/response times.
- Would like to see another restaurant.
- ILS would be nice.
- Need an ILS and Brite Radar for ATC VASI or PAPI. All runways, runway exits S/B marked, lighted better.
- Lengthen Runway 24.
- Lower fuel and parking costs would bring in more money. Napa tower is training tower, needs better supervision of trainees. Needs overall upgrading.
- This airport is so far behind the rest.
- No ILS.
- Airport can greatly benefit from competitors for Bridgeford Aviation. Excessively high fuel prices – pilots fly to other locations for fuel. Given weather prevailing patterns, this airport should have a full ILS instrument approach. Also, ATC tower not strong in handling high-density traffic.
- Fuel and hangar fees are too high. FBO's want our business, but they're unfriendly.
- Self serve fuel.

Noise Model Calculation Data

Napa County Airport

AIRCRAFT MIX (Estimated 2001 Activity Level)			
<i>Aircraft Type</i>	<i>Total Operations</i>		
	<i>Annual</i>	<i>Average Day</i>	<i>Percentage</i>
Single-Engine, Propeller, Fixed Pitch	54,000	147.95	42.83%
Single-Engine, Propeller, Variable Pitch	32,040	87.78	25.41%
Twin-Engine, Propeller, Piston	15,640	42.85	12.40%
Twin-Engine, Turboprop	13,140	36.00	10.42%
Small Business Jet (e.g., Citation)	5,630	15.42	4.47%
Medium Business Jet (e.g., Falcon 900)	1,250	3.42	1.00%
Large Business Jet (e.g., Gulfstream)	1,880	5.15	1.49%
Helicopter	2,500	6.85	1.98%
Total	126,080	345.42	100.00%

AIRCRAFT MIX (Forecast 2021 Activity Level)			
<i>Aircraft Type</i>	<i>Total Operations</i>		
	<i>Annual</i>	<i>Average Day</i>	<i>Percentage</i>
Single-Engine, Propeller, Fixed Pitch	97,000	265.75	37.31%
Single-Engine, Propeller, Variable Pitch	78,000	213.7	30.00%
Twin-Engine, Propeller, Piston	33,500	91.78	12.88%
Twin-Engine, Turboprop	27,000	73.97	10.38%
Small Business Jet (e.g., Citation)	12,500	34.25	4.81%
Medium Business Jet (e.g., Falcon 900)	4,500	12.33	1.73%
Large Business Jet (e.g., Gulfstream)	3,500	9.59	1.35%
Helicopter	4,000	10.96	1.54%
Total	260,000	712.33	100.00%

TIME OF DAY (Estimated 2001 and 2021)				
<i>Aircraft Type</i>		<i>Percentage of Operations by Aircraft Type</i>		
		<i>Day 7:00 a.m. 7:00 p.m.</i>	<i>Evening 7:00 p.m. 10:00 p.m.</i>	<i>Night 10:00 p.m. 7:00 a.m.</i>
Single-Engine, Propeller, Fixed Pitch	Takeoff	95.0%	4.0%	1.0%
	Landing	95.0%	4.0%	1.0%
Single-Engine, Propeller, Variable Pitch	Takeoff	95.0%	4.0%	1.0%
	Landing	95.0%	4.0%	1.0%
Twin-Engine, Propeller, Piston	Takeoff	97.0%	2.0%	1.0%
	Landing	97.0%	2.0%	1.0%
Twin-Engine, Turboprop	Takeoff	97.0%	2.0%	1.0%
	Landing	97.0%	2.0%	1.0%
All Business Jets	Takeoff	99.0%	1.0%	—
	Landing	99.0%	1.0%	—
Helicopter	Takeoff	75.0%	16.0%	9.0%
	Landing	75.0%	16.0%	9.0%

RUNWAY UTILIZATION (Estimated 2001 and 2021)								
<i>Aircraft Type</i>		<i>Percentage of Takeoffs and Landings</i>						
		<i>Runway 18R</i>	<i>Runway 36L</i>	<i>Runway 18L</i>	<i>Runway 36R</i>	<i>Runway 6</i>	<i>Runway 24</i>	<i>Helipad</i>
Single-Engine, Propeller, Fixed and Variable Pitch	Day	60.0	2.5	20.0	0.5	2.0	15.0	—
	Evening	60.0	2.5	20.0	0.5	2.0	15.0	—
	Night	60.0	2.5	20.0	0.5	2.0	15.0	—
Twin-Engine, Propeller, Piston	Day	60.0	2.5	20.0	0.5	20.0	15.0	—
	Evening	60.0	2.5	20.0	0.5	20.0	15.0	—
	Night	60.0	2.5	20.0	0.5	20.0	15.0	—
Twin-Engine, Turboprop	Day	75.0	5.0	—	—	5.0	15.0	—
	Evening	75.0	5.0	—	—	5.0	15.0	—
	Night	75.0	5.0	—	—	5.0	15.0	—
All Business Jets	Day	75.0	5.0	—	—	5.0	15.0	—
	Evening	75.0	5.0	—	—	5.0	15.0	—
	Night	75.0	5.0	—	—	5.0	15.0	—
Helicopter	Day	—	—	—	—	—	—	100.0
	Evening	—	—	—	—	—	—	100.0
	Night	—	—	—	—	—	—	100.0

FLIGHT TRACKS – TAKEOFFS (Estimated 2001 and 2021)																
Aircraft Type	Percentage of Track Usage by Runway															
	Runway 18R			Runway 36L		Runway 18L			Runway 36R	Runway 6			Runway 24			Helipad
	Straight Out	45° Right Turn	45° Left Turn	Straight Out	45° Left Turn	Straight Out	45° Right Turn	45° Left Turn	Straight Out	Straight Out	45° Right Turn	45° Left Turn	Straight Out	45° Right Turn	45° Left Turn	Straight Out
Single-Engine, Propeller, Fixed and Variable Pitch	50.0	30.0	20.0	20.0	80.0	50.0	30.0	20.0	100.0	70.0	15.0	15.0	40.0	20.0	40.0	–
Twin-Engine, Propeller, Piston	50.0	30.0	20.0	20.0	80.0	50.0	30.0	20.0	100.0	70.0	15.0	15.0	40.0	20.0	40.0	–
Twin-Engine, Turboprop	20.0	60.0	20.0	30.0	70.0	20.0	60.0	20.0	100.0	70.0	15.0	15.0	40.0	20.0	40.0	–
All Business Jets	100.0	–	–	100.0	–	–	–	–	–	100.0	–	–	100.0	–	–	–
Helicopters	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	100.0

FLIGHT TRACKS – LANDINGS (Estimated 2001 and 2021)													
Aircraft Type	Percentage of Track Usage by Runway												
	Runway 18R			Runway 36L	Runway 18L		Runway 36R	Runway 6	Runway 24			Helipad	
	Straight In	Close-in Right Turn	Right Turn	Straight In	Straight In	Left Turn	Straight In	Straight In	Straight In	Close-in Right Turn	Right Turn	Straight In	
Single-Engine, Propeller, Fixed and Variable Pitch	20.0	40.0	40.0	100.0	20.0	80.0	100.0	100.0	20.0	40.0	40.0	–	
Twin-Engine, Propeller, Piston	10.0	50.0	40.0	100.0	20.0	80.0	100.0	100.0	10.0	50.0	40.0	–	
Twin-Engine, Turboprop	20.0	20.0	60.0	100.0	–	–	–	100.0	20.0	20.0	60.0	–	
All Business Jets	100.0	–	–	100.0	–	–	–	100.0	100.0	–	–	–	
Helicopter	–	–	–	–	–	–	–	–	–	–	–	100.0	

Source: Data compiled by Mead & Hunt (July 2003)

**Biological Reconnaissance Survey
and Regulatory Permitting Strategy**

PREPARED FOR

NAPA COUNTY AIRPORT

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Figure 1: Potential Wetlands and Other Waters of the United States in and Adjacent to Napa County Airport Project Area

TABLES (at end of report)

Table A: Special-status Plant Species Potentially Occurring in Study Area at Napa County Airport

Table B: Special-status Animal Species Potentially Occurring in Study Area at Napa County Airport

INTRODUCTION

METHODS

Prior to conducting field work, LSA searched the *California Natural Diversity Data Base* (CNDDB) (California Department of Fish & Game [CDFG] 2002) and the *CNPS Electronic Inventory* (2002) to gather information on and locate records of special-status species and sensitive communities/habitats in the general region of the Napa County Airport (Airport). Lists of potentially occurring special-status species and sensitive habitats were developed, using information from these databases and pertinent previous reports, including *Napa Sanitation District Project Areas: Special Status Species Assessment* (ESA 1990), *Biological Resources Assessment, Napa County Airport Master Plan Update* (Golden Bear Biostudies 1991), *Napa Airport Industrial Area Specific Plan and EIR Update* (SWA 1995) and LSA's knowledge of plants and wildlife in Napa County.

LSA botanist Eva Buxton and soil scientist Sean Lohmann surveyed the Airport site on March 29, 2002, and LSA wildlife biologist Steve Granholm surveyed the site on May 22, 2002. The "study area" was defined as the project area and adjacent areas within 100 feet. The LSA team walked the various portions of the study area in search of: 1) evidence of special-status plant and animal species and/or habitats that could support such species; 2) sensitive plant communities; and 3) wetlands and drainage features (see below). Plants and animals observed during the survey were recorded in field notes.

All portions of the study area were searched for wetlands or watercourses potentially subject to state or federal jurisdiction. The field analysis was conducted per the standard wetland delineation methodology of the U.S. Army Corps of Engineers (Corps) (Environmental Laboratory 1987). This methodology requires evaluation of selected sample sites for water-logged soil characteristics, wetland-adapted vegetation, and physical evidence or direct observation of ponding. The analysis was completed at a preliminary level, with only enough data collected to provide a reasonably solid estimate of potential agency jurisdiction. A delineation suitable for submittal to the Corps and other agencies would require more data collection. LSA does not expect that the additional data collection would result in substantial changes to the wetland limits, but minor wetland boundary alterations might result. (Please note that the Corps reserves the authority to define the extent of waters of the United States, and both LSA's preliminary and final wetland analyses should be treated as estimates until field-verification has been conducted by the Corps. The state wetland regulatory agencies generally adopt the wetland and watercourse limits defined by the CWA process, though there is no state regulatory requirement that they do so.)

RESULTS

Vegetation and Plant Communities

The results of LSA's preliminary biological surveys and wetland analysis are depicted on the attached map entitled *Potential Wetlands and Other Waters of the United States in and Adjacent to Napa County Airport Project Area*. All of the seasonal wetlands (seasonal pools and drainage swales), the saline seasonal wetland, and the coastal (tidal) brackish marsh shown on that map are potentially

subject to U. S. Army Corps of Engineers (Corps) jurisdiction pursuant to the Clean Water Act, and subject to the state Regional Water Quality Control Board jurisdiction pursuant to both state and federal regulations. Some of these areas may also be subject to CDFG and San Francisco Bay Conservation and Development Commission (BCDC) jurisdiction.

The study area is composed of several parcels within the Napa County Airport airfield, all of which support low-growing, herbaceous plant species. There is no woody vegetation (trees and shrubs) within the study area. Several drainage swales and seasonal pools that support plant species adapted to wetland conditions are present on the site. In general, vegetation associated with upland areas consists of non-native species, whereas that of wetland areas is a mix of native and non-native species.

Three natural plant communities, some of which intergrade, were identified in the study area: non-native grassland/ruderal vegetation; seasonal wetlands (pools, drainage swales and saline wetland); and coastal (tidal) brackish marsh. In addition, a cultivated agricultural field is present.

Upland Plant Communities. The upland (non-wetland) plant communities in the study area are highly disturbed and can be classified into two types, as described below.

Non-native Grassland/Ruderal Vegetation. The majority of the study area supports grassland that is mowed frequently to provide for the safety of the airfield. Species in the grassland are those that are associated with upland conditions. Non-native, annual grasses such as Italian wildrye (*Lolium multiflorum*), hair-grass (*Aira caryophyllea*), ripgut brome (*Bromus diandrus*), and annual fescue (*Vulpia myuros*) are dominant, but stands of native grasses, especially the perennial creeping wildrye (*Leymus triticoides*), occur within the non-native grassland. Broad-leaved species (forbs) identifiable during the March survey include two native species, owl's-clover (*Triphysaria versicolor* ssp. *faucibarbata*) and small-flowered lupine (*Lupinus bicolor*), as well as the non-native burclover (*Medicago polymorpha*), hairy cat's-ear (*Hypochaeris radicata*), sheep-sorrel (*Rumex acetocella*), and vetches (*Vicia sativa*; *V. villosa*). In March some portions of the grassland, especially the area between the control tower and the south end of Runway 36 L, were dominated by two ruderal forbs, wild radish (*Raphanus sativus*) and mustard (*Brassica rapa*), in addition to tall, robust Italian wildrye. Two non-native species, soft chess (*Bromus hordeaceus*) and subterranean clover (*Trifolium subterraneum*), are the dominant plants in areas with fill material, especially in runway safety areas.

Agricultural Field. At least one field in the study area appears to be seeded and mown for hay. The parcel located to the south-east of the control tower supports a lush growth of Italian wildrye, a preferred plant in hay cultivation.

Wetland Plant Communities. Wetland vegetation occurs in areas where soils remain ponded and/or saturated for an extended period of time. Such soils support plant species that are adapted to various degrees of anaerobicity (oxygen-depleted soils).

Seasonal Pools and Drainage Swales. Several seasonally-ponded depressions and saturated swales occur scattered within the study area. During the March survey, the "wettest" of these

features supported quillwort (*Lilaea scilloides*), purple loose-strife (*Lythrum hyssopifolium*), spikerush (*Eleocharis macrostachya*), and toad-rush (*Juncus bufonius*), whereas the less “wet” areas were dominated by Italian wildrye interspersed with prickly ox-tongue (*Picris echinoides*), docks (*Rumex crispus*; *R. pulcher*), and spiny-fruit buttercup (*Ranunculus muricatus*). Stands of meadow barley (*Hordeum brachyantherum*), a native, perennial wetland grass, are also present in or adjacent to some of the wetland features.

Seasonal Pools with Vernal Pool Indicator Species. A few of the seasonally ponded pools present on the site (at least seasonal pools A and D) support plant species that are considered vernal pool indicator species. California semaphore grass (*Pleuropogon californicus*) and slender popcorn-flower (*Plagiobothrys stipitatus*) were the only vernal pool indicator species identifiable during the March survey.

Saline Seasonal Wetland. A seasonal swale at the south end of Runway 36 R supports species associated with saline soils. Wetland species adapted to such soils observed in March include Mediterranean barley (*Hordeum marinum* ssp. *gussoneanum*), brass-buttons (*Cotula coronopifolia*), pickleweed (*Salicornia virginica*), and saltgrass (*Distichlis spicata*). A patch of cattails (*Typha* sp.) and alkali bulrush (*Scirpus robustus*) is present in a deep, ponded section of the swale.

Coastal (Tidal) Brackish Marsh. A large wetland that has formed adjacent to an unnamed, tidally influenced creek south of Runway 36 L supports many of the same species as the saline swale at the south end of Runway 36 R. Pickleweed, saltgrass, fathen, and brass-buttons occur with stands of soft rush (*Juncus effusus*), Baltic rush (*Juncus balticus*), and rabbit's-foot grass (*Polypogon monspeliensis*), some of which are associated with Coastal Brackish Marsh (Holland 1986).

Sensitive Plant Communities/Habitats

Sensitive plant communities/habitats in California are those that are of limited extent or have experienced loss or degradation resulting from historic and current urban development, agricultural practices, or alteration of hydrology. These communities, monitored by the CDFG, are significant because of their importance to dependent and interdependent plants and animals. One sensitive plant community, Coastal Brackish Marsh, is present in the study area. This type of marsh is of high value to wildlife, providing habitat for many animal species, including special-status birds. The recorded occurrences of Coastal Brackish Marsh that are closest to the study area are from Hudeman Slough, Napa Slough, and Bull Island, near or on the Napa River (CNDDB, CDFG 2002).

Jurisdictional Wetlands

Drainage Swales. The Airport (airfield) is drained by a network of shallow swales and ditches that convey runoff offsite, generally in the direction of the marshlands to the west and the unnamed creek to the south. The swales and ditches have relatively shallow gradients due to the low elevation of the Airport and the level nature of the terrain. Runoff therefore moves rather slowly through the

drainage system, promoting the development of wetland characteristics. Clayey, impermeable soils and concentrated runoff from the large expanses of pavement also promote wetland development in the drainage features. LSA found that much of the project area is traversed by these broad swales, and determined that the swales meet federal wetland criteria (see map).

Wetland characteristics in some of the swales were quite well-developed (in Drainage Swales A and D) while others were difficult to distinguish from the surrounding fields (portions of Drainage Swale E). Low elevation areas surrounding the swales also display marginal wetland characteristics, but were not determined by LSA to meet federal wetland criteria. The transitions from potentially jurisdictional low areas to adjacent, non-jurisdictional grassland areas are subtle, and the Corps may very well choose to expand or contract the mapped wetlands to some extent.

Seasonal Pools. The proposed expansion sites also contain a few depressions that are subject to seasonal ponding. LSA found that these areas also meet Corps wetland criteria. The seasonal pools are most likely artifacts of Airport grading and construction, rather than remnant natural wetlands. This fact does not affect the jurisdictional status of the pools.

Coastal (Tidal) Brackish Marsh with Unnamed Creek. An unnamed creek passes adjacent to the southwest corner of the Airport. A segment of this creek would be affected by the proposed extension of Runway 36 L. The creek is clearly a water of the United States, with a high water mark, a low flow channel, mudflats, and expanses of adjacent brackish marsh. The segment of creek that would potentially be affected by the project is subject to at least muted tidal inundation. This conclusion is based on the observations that the water level in the brackish marsh was much lower on March 29, 2002 (when substantial mudflats were exposed on both sides of the unnamed creek) than on May 22, 2002 (when no mudflats were exposed).

Regulatory Status of Wetlands

Isolated Wetlands. The Corps does not assert jurisdiction over isolated wetlands, *i.e.*, those that are not adjacent to, or hydrological connected to navigable waters of the United States. The Napa River is the nearest navigable water to the Airport. Since the unnamed creek is directly tributary to the Napa River (via some channelized segments), the creek is not isolated.

The Corps normally considers culverts, storm sewers, and drainage ditches as hydrological connections, and thus all of the drainage swales are probably connected with the Napa River. Drainage Swales C, E, and F are tributary to the Napa River because they are directly tributary to the unnamed creek, which is in turn tributary to Napa River. The other drainage swales flow to the Napa River via more indirect means, but the Corps is unlikely to consider them isolated.

The seasonal pools are also unlikely to be considered isolated because they are all close enough to other waters of the United States to be considered “neighboring”, and therefore “adjacent.” In summary, none of the mapped wetlands are likely to be considered non-jurisdictional by reason of isolation.

Artificial Wetlands. With the exception of the unnamed creek and the adjacent brackish marsh, all of the wetlands on the site are artificial. The Corps may decline to assert jurisdiction over certain wetlands of artificial origin, but we do not believe the Corps is likely to decline jurisdiction in this case. The Corps will usually not assert jurisdiction over artificial wetlands that are actively managed and maintained, but the wetlands on the Airport site are passive, and in some cases of entirely incidental origin.

Special-status Species

Plants. The Napa County Airport lies within the distributional range of several special-status plant species. Table A lists eight (8) special-status species that have a potential to occur in the study area, *i.e.*, species for which habitat is present on the site. The table also shows the protective status, habitat requirement (general plant community and micro-habitat), blooming period, known occurrence locations in the vicinity of the Airport and specific types of wetlands that provide potential habitat in the study area. The species on the list are: Suisun Marsh aster (*Aster lentus*), soft bird's-beak (*Cordylanthus mollis* ssp. *mollis*), dwarf downingia (*Downingia pusilla*), Contra Costa goldfields (*Lasthenia conjugens*), delta tule pea (*Lathyrus jepsonii* var. *jepsonii*), legenere (*Legenere limosa*), Mason's lilaeopsis (*Lilaeopsis masonii*), and Marin knotweed (*Polygonum marinense*). Due to past and present disturbance to the upland grassy areas, no special-status species are expected to occur in the grasslands, therefore, no special-status species associated with uplands are considered in this report.

Golden Bear Biostudies conducted surveys for the eight special-status species listed above on the Airport property in 1991 and reported none to be present. These findings do not, however, preclude the occurrence of any, or all of these species at the present time. The presence, absence and detectability of plant populations fluctuate over time depending on ecological conditions. LSA observed no special-status species during the March survey, but the survey occurred too early in the season for such plants to be identifiable.

ESA (1990) surveyed the Airport property and reported seeing an unidentified member of the Sunflower family, potentially the Suisun Marsh aster, a CNPS List 1B species. Golden Bear (1991) reported that the unidentified plants were most likely gumplant (*Grindelia humilis*), a common species. Neither of these two species were sufficiently developed during LSA's March survey to have been identifiable.

Wildlife. The study area contains potential habitat for 13 special status-animal species (see Table B), and three of these species were observed on the May 22, 2002 site visit: northern harrier, California horned lark, and loggerhead shrike.

Non-native Grasslands, Agricultural Field, and Associated Seasonal Wetlands. These habitats, which occupy most of the study area, provide potential nesting habitat for three special-status raptors (birds of prey): northern harriers, burrowing owls, and short-eared owls. On the May 22, 2002 site visit, a female northern harrier exhibited typical nest-defense behavior while the observer walked a distance of about 400-500 feet along the southern edge of the study area.

During this entire time, the harrier was making agitated calls and circulating at a low elevation over the observer; and it dove twice at the observer's head. The attacks occurred about 900-1,000 feet west of the control tower. This behavior indicates that the harrier had an active nest in the near vicinity.

Burrowing owls were not observed on the site, but could nest or winter in the study area, typically using ground squirrel burrows or artificial cavities. Two ground squirrels were observed in the non-native grassland east of the control tower.

It is possible that short-eared owls nest in the study area, but this is considered unlikely, because they breed only rarely in the Bay Area. These owls would be more likely to winter in the study area. They were not observed on the site visits.

Two other special-status bird species were observed in the study area on May 22: (1) numerous horned larks were present, primarily along the edges of runways and taxiways, and on nearby bare soil and recently mowed grass; and (2) a loggerhead shrike was seen on a utility line near the southeast corner of the agricultural field. The study area contains potential nesting habitat for horned larks, but not for loggerhead shrikes (see Table B).

The study area also provides potential nesting habitat for tricolored blackbirds, in the large patches of tall mustard plants within the non-native grassland, east of the control tower. This species was not observed on the site.

Seasonal Wetlands. Two additional special-status species could occur in the seasonal wetlands on the site. The vernal pool fairy shrimp, a federally threatened species, was recorded just outside the Airport fence, about 500 feet southwest of the control tower, in 2000. This species could occur in the study area, in seasonal pools and in seasonally ponded areas within the drainage swales. The San Francisco common yellowthroat could nest in the small patches of willows, cattails, and tules that occur in some of the wetter areas in the drainage swales.

Coastal (Tidal) Brackish Marsh. The coastal brackish marsh could support three other special-status species. The California black rail, a state threatened species, has been recorded at Fagan Slough in 1977, near the Airport, and could nest and/or winter in the brackish marsh in the study area. The brackish marsh appears too saline to support the California red-legged frog (a federally threatened species) and the western pond turtle, but it is possible these species could occur in the marsh, particularly in winter when higher streamflows reduce the salinity of the marsh.

Other Species. One other special-status species, the pallid bat, could occur in the study area, if suitable roost-sites are present in the control tower.

REGULATORY FRAMEWORK

Federal Endangered Species Act

The U.S. Fish and Wildlife Service (USFWS) has jurisdiction over federally-listed threatened and endangered species under the federal Endangered Species Act (FESA). The USFWS also maintains a list of 'proposed' species and candidate species that are not legally protected under the FESA, but are often included in their review of a project as they may become listed in the near future.

The FESA protects listed animal species from harm or "take" which is broadly defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct. Take can also include habitat modification or degradation that results in death or injury to a listed species. An activity can be defined as a "take" even if it is unintentional or accidental. Listed plant species are provided less protection than listed wildlife species. Listed plant species are legally protected from take under FESA if they occur on federal lands.

Pursuant to the requirements of the FESA, a federal agency reviewing a proposed project within its jurisdiction must determine whether any federally-listed threatened or endangered species (plants and animals) may be present in the project area and determine whether the proposed project may affect such species. Any activities that could result in the take of a federally-listed species will require formal consultation with the USFWS before project activities commence.

California Endangered Species Act

The California Endangered Species Act (CESA) protects any plant or animal listed or proposed for listing as rare (plants only), threatened, or endangered. In accordance with the CESA, the California Department of Fish and Game (CDFG) has jurisdiction over state-listed species (California Fish and Game Code 2070). Take of state-listed species requires a permit from CDFG, which is granted only under strictly limited circumstances. Additionally, the CDFG maintains lists of "species of special concern" that are defined as animal species that appear to be vulnerable to extinction because of declining populations, limited ranges, and/or continuing threats. Pursuant to the requirements of CESA, an agency reviewing a proposed project within its jurisdiction must determine whether any state-listed or proposed endangered or threatened species may be present in the project area and determine whether the proposed project may result in a significant impact on such species.

California Environmental Quality Act

Section 15380(b) of the California Environmental Quality Act (CEQA) Guidelines provides that a species not listed on the federal or state list of protected species may be considered rare or endangered if the species can be shown to meet certain specified criteria. These criteria have been modeled after the definitions in FESA and CESA and the section of the California Fish and Game Code dealing with rare or endangered plants or animals. This section was included in the guidelines primarily to deal with situations in which a public agency is reviewing a project that may have a significant effect on a species that has not yet been listed by either the USFWS or CDFG. Thus, CEQA provides an agency with the ability to protect a species from a project's potential impacts, if it finds that the species meets the criteria of a threatened or endangered species.

Clean Water Act

Under Section 404 of the federal Clean Water Act, the U.S. Army Corps of Engineers (Corps) is responsible for regulating the discharge of fill material into waters of the United States. Waters of the U.S. and their lateral limits are defined in 33 CFR Part 328.3 (a) and include streams that are tributary to navigable waters and their adjacent wetlands. Wetlands that are not adjacent to waters of the U.S. are termed “isolated wetlands” and, depending on the circumstances, may also be subject to Corps jurisdiction.

In general, a Corps permit must be obtained before placing fill in wetlands or other waters of the U.S. The type of permit depends on the acreage involved and the purpose of the proposed fill. Minor amounts of fill are sometimes covered by Nationwide Permits, which were established to streamline the permit process for projects with “minimal” impacts on wetlands or other waters of the U.S. An Individual Permit is required for projects that result in more than a minimal impact on jurisdictional areas. The Individual Permit process requires evidence that fill of jurisdictional areas has been minimized to the extent “practicable” and provides an opportunity for public review of the project.

California Water Quality and Waterbody Regulatory Programs

Pursuant to Section 401 of the federal Clean Water Act and the state’s Porter-Cologne Act, projects that are regulated by the Corps must obtain water quality certification from the Regional Water Quality Control Board (RWQCB). This certification ensures that the project will uphold state water quality standards. The RWQCB sometimes asserts jurisdiction over wetlands that the Corps does not (e.g. certain isolated wetlands) and may impose mitigation requirements even if the Corps does not.

The CDFG also exerts jurisdiction over the bed and banks of watercourses and waterbodies according to provisions of Section 1601 to 1603 of the Fish and Game Code. The Fish and Game Code requires a Stream Alteration Agreement for the fill or removal of material within the bed and banks of a watercourse or waterbody.

McAteer-Petris Act

The San Francisco Bay Conservation and Development Commission (BCDC) is a state agency that was established to regulate filling of San Francisco Bay and to increase public access to the Bay shoreline, as required by the McAteer-Petris Act. A permit from BCDC is required prior to placing fill in or over the Bay, or dredging the Bay, or developing projects within 100 feet from the Bay shoreline. BCDC’s “Bay” jurisdiction extends into the lower reaches of rivers and creeks that flow into the Bay. The upstream extent of BCDC jurisdiction on a given waterway is generally determined based on a site visit by BCDC staff. BCDC also has jurisdiction over salt ponds and managed wetlands along the edge of the Bay.

Other Statutes, Codes, and Policies

The federal Migratory Bird Treaty Act (16 U.S.C., Sec. 703, Supp. I, 1989) prohibits killing, possessing, or trading in migratory birds except in accordance with regulations prescribed by the Secretary of the Interior. This act encompasses whole birds, parts of birds, and bird nests and eggs. Most native bird species on the project site are covered by this Act.

The federal *Bald and Golden Eagle Protection Act* prohibits persons within the United States (or places subject to U.S. jurisdiction) from "possessing, selling, purchasing, offering to sell, transporting, exporting or importing any bald eagle or any golden eagle, alive or dead, or any part, nest, or egg thereof."

Birds of prey (hawks, eagles, falcons, and owls) are protected in California under the State Fish and Game Code, Section 3503.5). Section 3503.5 states that it is "unlawful to take, possess, or destroy any birds in the order Falconiformes or Strigiformes (birds of prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto." Disturbance that causes nest abandonment and/or loss of reproductive effort is considered "taking" by the CDFG and would be considered a significant impact.

The California Native Plant Society (CNPS), a non-governmental conservation organization, has developed lists of special-status plant species of concern in California (CNPS 2001). Vascular plants included on these lists are defined as follows:

List 1A	Plants considered extinct.
List 1B	Plants rare, threatened, or endangered in California and elsewhere.
List 2	Plants rare, threatened, or endangered in California but more common elsewhere.
List 3	Plants about which more information is needed - a review list.
List 4	Plants of limited distribution - a watch list.

Although the CNPS is not a regulatory agency, and plants on these lists have no formal regulatory protection, plants appearing on List 1A, 1B or List 2 are, in general, considered to meet CEQA's Section 15380 criteria and adverse effects to these species are normally considered "significant".

PERMITTING STRATEGY

LSA's preliminary proposal dated June 26, 2002 presented a strategy for completing the regulatory permitting for Napa County Airport projects and the new Airport Master Plan. Some of the key elements of this strategy are:

- Entering into informal consultation with regulatory agencies (Corps, BCDC, and RWQCB) and resource agencies (CDFG and USFWS) to clarify their positions on some of the key issues, including: (1) whether BCDC will assert jurisdiction over the unnamed creek and, if so, how far upstream such jurisdiction extends; (2) Corps verification of LSA's mapping of wetlands and other waters of the United States; (3) special-status species that may be affected by Airport project; (4) acceptable site-specific protocols for surveys of such species; (5) suitable mitigation

for impacts on wetlands and special-status species (e.g., location of mitigation sites, type and acreage of wetlands to be created, and acceptability of using a mitigation bank)

- Conducting surveys for selected special-status species that are necessary or advisable in the early stages of the permit process, in order to better define the environmental issues and permitting requirements for the Airport projects. For the project area addressed in this report, surveys should be conducted for (1) the eight rare plant species that potentially occur on the site; (2) vernal pool fairy shrimp; and (3) California black rail. In addition, we recommend a habitat assessment for the California red-legged frog and western pond turtle, which would assess habitat suitability (and review prior studies, if available) on the unnamed creek upstream from the project area, as well as on the project site. Then, if USFWS believes that red-legged frogs may occur on the project site, protocol-level surveys should be conducted.
- Addressing other special-status species in the permit applications by (1) assuming presence on the site, if little or no mitigation is likely to be required; or (2) agreeing to conduct pre-construction surveys for selected special-status bird species (e.g., northern harrier, burrowing owl, short-eared owl, and tricolored blackbird) and to protect a buffer around each active nest during the nesting season.
- Addressing water quality issues, particularly for the RWQCB application. RWQCB is likely to require a stormwater management plan prior to issuing its authorization, as it has been doing for many projects in the San Francisco Bay region.
- Preparing the necessary CEQA and National Environmental Policy Act (NEPA) documents, followed by the permit applications to the Corps, RWQCB, BCDC, and CDFG. (In addition, the Corps will consult with the USFWS if any federally listed species may be adversely affected.) A key element in the Corps and RWQCB permit applications will be to demonstrate that wetland impacts have been minimized to the extent practicable. Similarly, the BCDC application will need to demonstrate that fill in the Bay has been minimized. In addition, a BCDC permit typically requires improvements in public access to the Bay shoreline. All three permit applications will need to demonstrate that impacts to state and federally listed species have been minimized. Both RWQCB and BCDC will require a certified CEQA document before approving permits for the project.

LITERATURE CITED

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Table A - Special-status Plant Species Potentially Occurring in Study Area at Napa County Airport

Species	Status ¹ Federal/State/ CNPS	Habitat Requirement and Blooming Period	Location Records and General Information ²	Potential Habitat in Study Area
<i>Aster lentus</i> Suisun Marsh aster	-/-/List 1B	Brackish and freshwater marsh; along sloughs with sedges, common reed, blackberry, cattails, and others. Blooms May-November.	Several records from Fagan Marsh, directly W of Airport; no designated dates. One record in 1986 from NE of Fagan Slough. Species endemic to Sacramento/San Joaquin river-delta.	Tidal brackish marsh adjacent to unnamed creek; seasonal wetlands.
<i>Cordylanthus mollis</i> ssp. <i>mollis</i> Soft bird's-beak	FE/CR/List 1B	Coastal salt marsh; with saltgrass, pickleweed, alkali heath, and others. Blooms July-November.	Nearest locations recorded from between Fagan Slough and Steamboat Slough, and Fly Bay, NW of Edgerly Island, W of Airport.	Tidal brackish marsh adjacent to unnamed creek; saline seasonal wetland.
<i>Downingia pusilla</i> Dwarf downingia	-/-/List 2	Mesic grassland and vernal pools; along margins of several types of pools. Blooms March-May.	Nearest recorded location between Suscol and Sheehy Creeks, 1.8 miles NNE of Airport. No date designated.	Seasonal pools and drainage swales.
<i>Lasthenia conjugens</i> Contra Costa goldfields	FE/-/List 1B	Mesic grassland and vernal pools; in vernal pools, swales, and low depressions in open, grassy areas. Blooms March-June.	Nearest recorded location from just N of Suscol Creek, 4 miles S of Napa. Last seen in 1995. This species is extirpated from most of its range and considered "extremely" endangered.	Seasonal pools and drainage swales.
<i>Lathyrus jepsonii</i> var. <i>jepsonii</i> Delta tulle pea	-/-/List 1B	Freshwater and brackish marshes; often found with Suisun Marsh aster, California rose, rushes, and sedges; usually on marsh and slough edges. Blooms May-September.	Several records from Napa River near Cuttings Wharf and Fagan Slough/Fagan Marsh. One record dated 2000 in Fagan Marsh, one undated sighting recorded from between Fagan Slough and Airport.	Tidal brackish marsh adjacent to unnamed creek; seasonal wetlands.

Species	Status ¹ Federal/State/ CNPS	Habitat Requirement and Blooming Period	Location Records and General Information ²	Potential Habitat in Study Area
<i>Legenere limosa</i> Legenere	-/-/List 1B	Vernal pools. Blooms April-June.	No records exist for this species in Napa County, however, species easily overlooked due to small, "delicate" stature of plant. Potentially present in study area.	Seasonal pools.
<i>Lilaeopsis masonii</i> Mason's lilaeopsis	-/CR/List 1B	Freshwater and brackish marsh; tidal zones, in muddy or silty soils formed through river deposition or river bank erosion. Blooms April-November.	Location records from shoreline of Napa River, from City of Napa to Hwy. 37 bridge over Napa River. Last observed in 1995.	Tidal brackish marsh adjacent to unnamed creek.
<i>Polygonum marinense</i> Marin knotweed	-/-/List 3	Brackish and coastal salt marshes. Blooms April-October.	Location records from Fagan Marsh, in 1989, and from WNW of Flosden Acres (Vallejo), in 1995. Old record (1932) from near Cuttings Wharf.	Tidal brackish marsh adjacent to unnamed creek.

¹ FE = Federally endangered.

CR = California rare.

List 1B = California Native Plant Society (CNPS) - Plant rare, threatened, or endangered in California and elsewhere.

List 2 = Plant rare threatened, or endangered in California but more common elsewhere.

List 3 = Plant about which more information is needed.

² Includes California Natural Diversity Data Base (CDFG 2002) information.

Table B - Special-status Animal Species Potentially Occurring in Study Area at Napa County Airport

Species	Status ¹ (Federal/State /CDFG)	Habitat Requirement	Location Records and General Information ²	Potential Habitat in Study Area
INVERTEBRATES				
Vernal pool fairy shrimp <i>Branchinecta lynchi</i>	FT/--	Vernal pools and other seasonal pools	Recorded in 2000 from a pool along S end of Airport, 500 feet SW of control tower along fence line.	Seasonal pools, and seasonally ponded areas within the drainage swales.
AMPHIBIANS				
California red-legged frog <i>Rana aurora draytonii</i>	FT/--	Perennial and seasonal ponds, creeks, seeps, and adjacent riparian corridors and grasslands.	Nearest record 4.2 miles SE of Airport in tributary to American Canyon Creek (1998).	Possible, but unlikely in unnamed creek. Could occur during winter, when higher flows reduce salinity within the study area.
REPTILES				
Western pond turtle <i>Clemmys marmorata</i>	--/CSC	Ponds, marshes, rivers, streams, and irrigation ditches with aquatic vegetation.	No records within 10 miles of Airport. Three records from Rodeo Creek by Hercules.	Possible, but unlikely in unnamed creek; salinity is probably too high.
BIRDS³				
Northern harrier <i>Circus cyaneus</i>	--/CSC	Open grassland, ruderal and marshy habitats. Generally nests on ground, in tall, dense vegetation.	Breeding and wintering species around the shoreline of San Pablo Bay. No CNDDDB records near the study area. ²	Probable winter resident. Appropriate nesting habitat is present in non-native grasslands and agricultural fields. Observed evidence of nesting in or near study area. ⁴

Species	Status ¹ (Federal/State /CDFG)	Habitat Requirement	Location Records and General Information ²	Potential Habitat in Study Area
California black rail <i>Laterallus jamaicensis coturniculus</i>	-/ST/--	Salt marshes bordering larger bays, also found in freshwater and brackish marshes.	Recorded at Fagan Slough in 1977, 0.75 mile W of Airport. Also recorded in South, White, and Napa Sloughs.	Brackish marsh along unnamed creek. Could nest and/or winter in study area.
Burrowing owl <i>Athene cunicularia</i>	-/--/CSC	Nests in burrows in open grasslands often associated with ground squirrels. Will also nest in artificial structures (e.g., culverts, concrete debris piles, etc.).	Recorded in 1988 at Upper Tubbs Island at junction of HW 37 and HW 121, approximately 10 miles W of Airport.	Non-native grasslands and agricultural field. Could nest and/or winter in study area.
Short-eared owl <i>Asio flammeus</i>	-/--/CSC	Open grassland, ruderal, and marshy habitats. Generally nests on ground, in tall, dense vegetation.	Winters and (rarely) nests around the shoreline of San Francisco Estuary. No CNDDDB records near the study area. ²	Possible winter resident. Could nest in tall dense vegetation, in non-native grasslands and agricultural fields, but unlikely due to rarity of nesting in Bay Area.
California horned lark <i>Eremophila alpestris actia</i>	-/--/CSC	Level or rolling grasslands with short vegetation; follow grain fields.	Occurs year-round in Bay Area, but no CNDDDB records near the study area. ² Observed onsite, May 2002. ⁴	Non-native grasslands and agricultural fields, primarily areas with short vegetation, e.g. where recently mowed. Could nest in study area.
Loggerhead shrike <i>Lanius ludovicianus</i>	-/--/CSC	Open terrain with short or sparse vegetation and well- spaced lookout posts, e.g., fences, utility lines, or scattered trees or shrubs. Nests in dense-foliaged trees or shrubs.	Occurs year-round in Bay Area but no CNDDDB records near the study area. ² Observed onsite, May 2002. ⁴	Non-native grasslands and agricultural fields, near fences, utility lines, or other perches. No suitable nest-sites in study area.

Species	Status ¹ (Federal/State /CDFG)	Habitat Requirement	Location Records and General Information ²	Potential Habitat in Study Area
San Francisco common yellowthroat <i>Geothlypis trichas sinuosa</i>	-/-/CSC	Fresh- and saltwater marshes with tall grasses, bulrush, and willows. Requires thick, continuous cover down to water surface for foraging.	Several records from marshes surrounding Napa, Sonoma, South, and China Sloughs, as well as Sonoma Creek. Two records from Fagan Marsh, directly W of Airport.	Brackish marsh along Unnamed Creek.
Tricolored blackbird <i>Agelaius tricolor</i>	-/-/CSC	Usually nests in freshwater marshes with dense cattails or bulrush; also in blackberry thickets and patches of tall mustard plants. Requires foraging area within a few kilometers of the colony.	One colony 0.8 E of airport just SW of junction of Aviation Way and HW 29. Another colony recorded on W side of HW 29, 1 mile S of same junction	Large patches of tall mustard plants within non-native grassland, east of the control tower.
MAMMALS				
Suisun shrew <i>Sorex ornatus sinuosis</i>	-/-/CSC	Tidal marshes of the northern shores of San Pablo and Suisun Bays.	Recorded in 1984 along South Slough and Dutchman's Slough, 5.2 miles SW of Airport.	Brackish marsh along Unnamed Creek.
Pallid bat <i>Antrozous pallidus</i>	-/-/CSC	Deserts, grasslands, shrublands, woodlands, and forests. Most common in open, dry habitats with rocky areas for roosting.	Recorded in 1995 (house) and 1999 (bridge) near Cuttings Wharf, 3.5 miles NW of Airport.	Possible roost-sites in control tower.

1 **STATUS**

FE = Federally-listed as Endangered

FT = Federally-listed as Threatened

SE = State-listed as Endangered

ST = State-listed as Threatened

CSC = California Species of Special Concern

2 California Department of Fish and Game. 2000. California Natural Diversity Data Base (CNDDB). Special-status species occurrences for the Cuttings Wharf, Sonoma, Napa, Mt. George, Sears Point, Cordelia, Petaluma Point, Mare Island, and Benicia 7.5-minute USGS quadrangles. Natural Heritage Division, Sacramento.

3 Other special-status birds of prey could forage in the study area, but are unlikely to nest there, due to a lack of trees, cliffs, or other suitable nest-sites. These species include golden eagle, white-tailed kite, peregrine falcon, and merlin (the latter does not nest in the Bay Area, but occurs in winter).

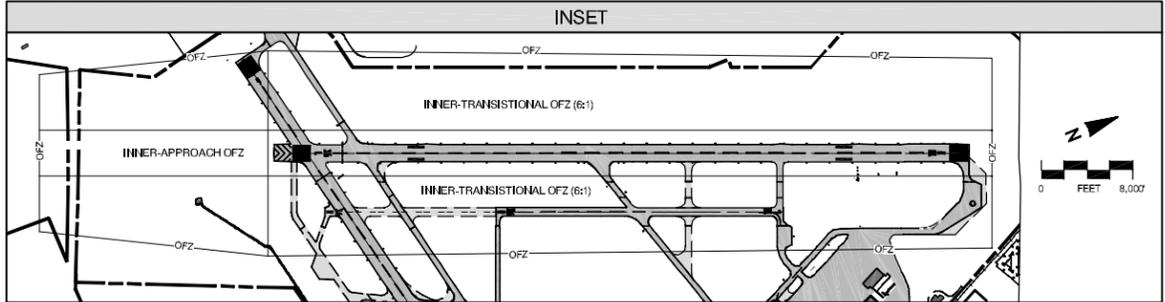
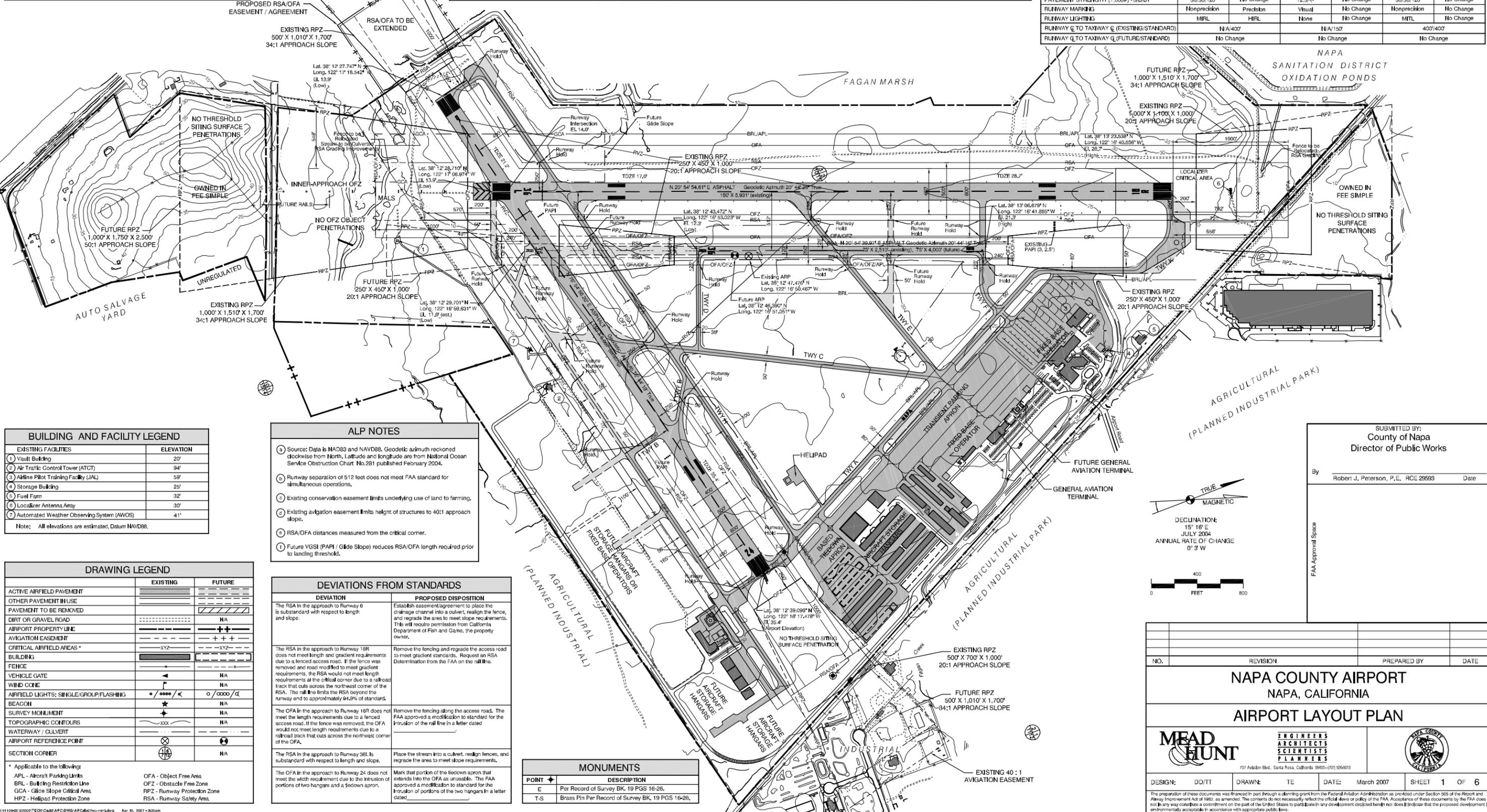
4 LSA Associates observation, May 22, 2002.

Airport Plan Drawings



AIRPORT DATA		
	EXISTING	FUTURE
AIRPORT REFERENCE CODE	C-II	C-III
AIRPORT REFERENCE POINT	Latitude 38° 12' 47.476"N Longitude 122° 16' 50.467"W	Latitude 38° 12' 46.390"N Longitude 122° 16' 51.051"W
AIRPORT ELEVATION (Above Mean Sea Level)	35.4'	No Change
MEAN MAX. TEMP. (Hottest Month)	82°F	No Change
AIRPORT AND TERMINAL NAVIGATIONAL AIDS	Beacon, LOC, MALS	Beacon, ILS, MALS
GPS APPROACH ESTABLISHED	Yes	No Change
AIRPORT ACREAGE	Fee Simple 794.4 County Easements 237	No Change 150
BASED AIRCRAFT SPACES	Hangar Spaces 60 FBA Area (Approx.) 45	No Change 150 65
TRANSIENT AIRCRAFT SPACES	County Apron 50	No Change 95

RUNWAY DATA						
AIRPORT REFERENCE CODE	RUNWAY 18R-36L		RUNWAY 18L-36R		RUNWAY 6-24	
	EXISTING	FUTURE	EXISTING	FUTURE	EXISTING	FUTURE
AIRCRAFT	Gulfstream II	Global Express	B-1 Small	No Change	Gulfstream II	Global Express
WINGSPAN	77' 10"	93' 6"	35' 5"	No Change	77' 10"	93' 6"
APPROACH SPEED (kts.)	135	106	55	No Change	135	106
MAX. TAKEOFF WT. (lbs.)	69,700	91,000	2,900	No Change	69,700	91,000
PHYSICAL LENGTH AND WIDTH	150' x 5,931'	No Change	75' x 2,510'	No Change	150' x 5,007'	No Change
VERTICAL LINE OF SIGHT PROVIDED	Yes	No Change	Yes	No Change	Yes	No Change
WIND COVERAGE	98.2%	No Change	95.1%	No Change	95.8%	No Change
RUNWAY TOUCH DOWN ZONE ELEVATION	267' 14"	No Change	NA	No Change	197' 33"	No Change
EFFECTIVE GRADIENT (%)	0.25%	No Change	0.34%	No Change	0.44%	No Change
MAXIMUM GRADIENT (%)	0.41%	No Change	0.50%	No Change	0.70%	No Change
RUNWAY/TAXIWAY SURFACE TYPE	PCC/Asphalt	No Change	Asphalt	No Change	PCC Asphalt	No Change
PAVEMENT STRENGTH (1,000#) - S/D/D/T	30/50/120	No Change	12.5/4-	No Change	30/50/120	No Change
RUNWAY MARKING	Nonprecision	Precision	Visual	No Change	Nonprecision	No Change
RUNWAY LIGHTING	MIRL	HRL	None	No Change	MTL	No Change
RUNWAY @ TO TAXIWAY @ (EXISTING/STANDARD)	N/A/400'		N/A/150'		400'/400'	
RUNWAY @ TO TAXIWAY @ (FUTURE/STANDARD)	No Change		No Change		No Change	



BUILDING AND FACILITY LEGEND	
EXISTING FACILITIES	ELEVATION
1 Vault Building	20'
2 Air Traffic Control Tower (ATCT)	94'
3 Airline Pilot Training Facility (JAL)	58'
4 Storage Building	25'
5 Fuel Farm	32'
6 Localizer Antenna Array	30'
7 Automated Weather Observing System (AWOS)	41'

Note: All elevations are estimated. Datum NAVD83.

- ALP NOTES**
- Source: Data is NAD83 and NAVD83. Geodetic azimuth reckoned clockwise from North. Latitude and longitude are from National Ocean Service Obstruction Chart No. 281 published February 2004.
 - Runway separation of 512 feet does not meet FAA standard for simultaneous operations.
 - Existing conservation easement limits underlying use of land to farming.
 - Existing aviation easement limits height of structures to 40:1 approach slope.
 - RSA/OFA distances measured from the critical corner.
 - Future VGS (PAPI / Glide Slope) reduces RSA/OFA length required prior to landing threshold.

DRAWING LEGEND		
	EXISTING	FUTURE
ACTIVE AIRFIELD PAVEMENT		
OTHER PAVEMENT IN USE		
PAVEMENT TO BE REMOVED		NA
DIRT OR GRAVEL ROAD		NA
AIRPORT PROPERTY LINE		
AVIGATION EASEMENT		
CRITICAL AIRFIELD AREAS*		
BUILDING		
FENCE		
VEHICLE GATE		NA
WIND CONE		NA
AIRFIELD LIGHTS: SINGLE/GROUP/FLASHING		
BEACON		NA
SURVEY MONUMENT		NA
TOPOGRAPHIC CONTOURS		NA
WATERWAY / CULVERT		
AIRPORT REFERENCE POINT		
SECTION CORNER		NA

* Applicable to the following:
 APL - Aircraft Parking Limits
 BRL - Building Restriction Line
 GCA - Glide Slope Critical Area
 HPZ - Helipad Protection Zone
 OFA - Object Free Area
 OFZ - Obstacle Free Zone
 RPZ - Runway Protection Zone
 RSA - Runway Safety Area

DEVIATIONS FROM STANDARDS	
DEVIATION	PROPOSED DISPOSITION
The RSA in the approach to Runway 6 is substantially with respect to length and slope.	Establish easement agreement to place the drainage channel into a culvert, realign the fence, and regrade the area to meet slope requirements. This will require permission from California Department of Fish and Game, the property owner.
The RSA in the approach to Runway 18R does not meet length and gradient requirements due to a fenced access road. If the fence was removed and road modified to meet gradient requirements, the RSA would not meet length requirements at the critical corner due to a railroad track that cuts across the northeast corner of the RSA. The rail line limits the RSA beyond the runway end to approximately 94.9% of standard.	Remove the fencing and regrade the access road to meet gradient standards. Request an RSA Determination from the FAA on the rail line.
The OFA in the approach to Runway 18R does not meet the length requirements due to a fenced access road. If the fence was removed, the OFA would not meet length requirements due to a railroad track that cuts across the northeast corner of the OFA.	Remove the fencing along the access road. The FAA approved a modification to standards for the intrusion of the rail line in a letter dated [redacted].
The RSA in the approach to Runway 36L is substantially with respect to length and slope.	Place the stream into a culvert, realign fences, and regrade the area to meet slope requirements.
The OFA in the approach to Runway 24 does not meet the width requirement due to the intrusion of portions of two hangars and a tiedown apron.	Mark that portion of the tiedown apron that extends into the OFA as unusable. The FAA approved a modification to standard for the intrusion of portions of the two hangars in a letter dated [redacted].

MONUMENTS	
POINT	DESCRIPTION
E	Per Record of Survey BK, 19 PGS 16-26.
T-S	Brass Pin Per Record of Survey BK, 19 PGS 16-26.

SUBMITTED BY:
 County of Napa
 Director of Public Works

By Robert J. Peterson, P.E., RCE 29583 Date _____

DECLINATION:
 15° 18' E
 JULY 2004
 ANNUAL RATE OF CHANGE
 0° 3' W

0 400 800
 FEET

TRUE
 MAGNETIC

NO. _____ REVISION _____ PREPARED BY _____ DATE _____

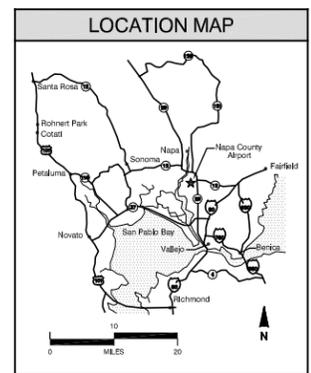
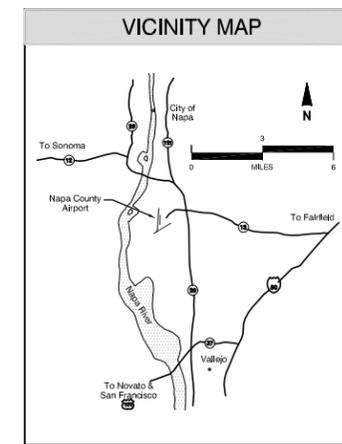
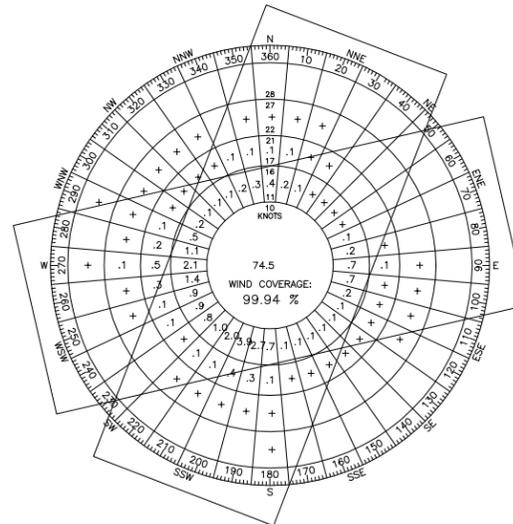
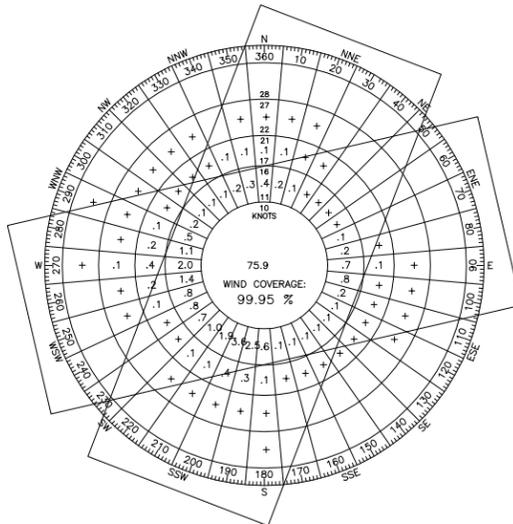
NAPA COUNTY AIRPORT
 NAPA, CALIFORNIA
AIRPORT LAYOUT PLAN

MEAD HUNT
 ENGINEERS ARCHITECTS SCIENTISTS PLANNERS
 707 Aviation Blvd., Santa Rosa, California 95403 • (707) 538-0010

DESIGN: DD/TT DRAWN: TE DATE: March 2007 SHEET 1 OF 6

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

RUNWAY END DATA							
APPROACH END OF RUNWAY:		18R	36L	6	24	18L	36R
RUNWAY END COORDINATES (a)	Latitude	Existing 38° 13' 23.538" N	38° 12' 28.710" N	38° 12' 27.747" N	38° 12' 39.098" N	38° 13' 06.679" N	38° 12' 43.472" N
	Future	No Change	No Change	No Change	No Change	No Change	38° 12' 29.701" N
Longitude	Existing	122° 16' 40.656" W	122° 17' 06.974" W	122° 17' 18.542" W	122° 16' 17.478" W	122° 16' 41.885" W	122° 16' 53.023" W
	Future	No Change	No Change	No Change	No Change	No Change	122° 16' 59.631" W
RUNWAY END ELEVATIONS (b)	Existing	28.7 Feet	13.9 Feet	13.9 Feet	35.4 Feet	21.3 Feet	12.3 Feet
	Future	No Change	No Change	No Change	No Change	No Change	11 Feet (est.)
NAVIGATION AIDS	Existing	None	LOC, OM	None	None	None	None
	Future	No Change	ILS	No Change	No Change	No Change	No Change
VISUAL AIDS	Existing	None	MALSF	REIL	None	None	None
	Future	PAFI	MALSR	PAFI	PAFI	No Change	No Change
APPROACH TYPE (FAR Part 77 Category)	Existing	Visual	Nonprecision	Nonprecision	Visual	Visual	Visual
	Future	Nonprecision	Precision	No Change	Nonprecision	No Change	No Change
APPROACH VISIBILITY (Minimums)	Existing	Visual	3/4 Mile	1 Mile	Visual	Visual	Visual
	Future	1 Mile	1/2 Mile	No Change	No Change	No Change	No Change
APPROACH SLOPE (Required/Clear)	Existing	20:1/43:1	34:1/43:1	34:1/50:1	20:1/29:1	20:1/50:1	20:1/50:1
	Future	No Change	50:1/43:1	No Change	No Change	No Change	No Change
RUNWAY SAFETY AREA (Width)	Existing	500 Feet	500 Feet	500 Feet	500 Feet	120 Feet	120 Feet
	Future	No Change	No Change	No Change	No Change	No Change	No Change
RUNWAY SAFETY AREA (Length Beyond Runway End) (e)	Existing/Standard	721 / 1,000 Feet	570 / 1,000 Feet	275 / 1,000 Feet	1,000 / 1,000 Feet	240 / 240 Feet	240 / 240 Feet
	Future/Standard	792 / 1,000 Feet	1,000 / 1,000 Feet	1,000 / 1,000 Feet	No Change	No Change	No Change
RUNWAY SAFETY AREA (Length Prior to Landing Threshold) (e)(f)	Existing/Standard	721 / 600 Feet	570 / 1,000 Feet	275 / 1,000 Feet	1,000 / 1,000 Feet	240 / 240 Feet	240 / 240 Feet
	Future/Standard	792 / 600 Feet	1,000 / 600 Feet	1,000 / 600 Feet	1,000 / 600 Feet	No Change	No Change
OBJECT FREE AREA (Width)	Existing	800 Feet	800 Feet	800 Feet	800 Feet	800 Feet	800 Feet
	Future	No Change	No Change	No Change	No Change	No Change	No Change
OBJECT FREE AREA (Length Beyond Runway End) (e)	Existing/Standard	658 / 1,000 Feet	491 / 1,000 Feet	275 / 1,000 Feet	1,000 / 1,000 Feet	240 / 240 Feet	240 / 240 Feet
	Future/Standard	No Change	1,000 / 1,000 Feet	1,000 / 1,000 Feet	No Change	No Change	No Change
OBJECT FREE AREA (Length Prior to Landing Threshold) (e)(f)	Existing/Standard	658 / 600 Feet	491 / 1,000 Feet	275 / 1,000 Feet	1,000 / 1,000 Feet	240 / 240 Feet	240 / 240 Feet
	Future/Standard	No Change	1,000 / 600 Feet	1,000 / 600 Feet	1,000 / 600 Feet	No Change	No Change
OBSTACLE FREE ZONE (Width)	Existing	400 Feet	400 Feet	400 Feet	400 Feet	200 Feet	200 Feet
	Future	No Change	No Change	No Change	No Change	No Change	No Change
OBSTACLE FREE ZONE (Length Beyond Runway End)	Existing	200 Feet	200 Feet	200 Feet	200 Feet	200 Feet	200 Feet
	Future	No Change	No Change	No Change	No Change	No Change	No Change
DISTANCE FROM RWY (g)	Existing	250 Feet	No Change	250 Feet	No Change	125 Feet	No Change
	Future	No Change	No Change	No Change	No Change	No Change	No Change



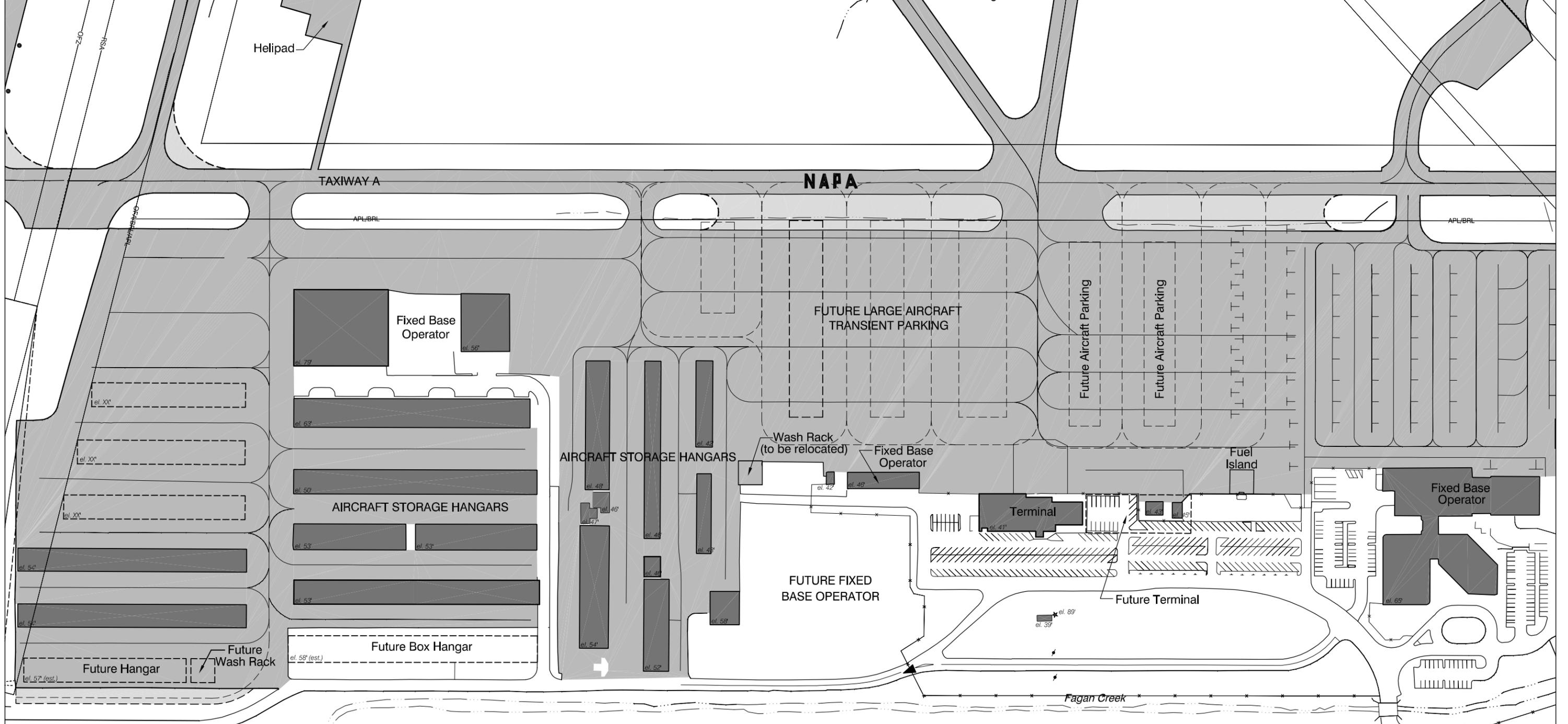
ALL WEATHER WIND ROSE (16 KNOTS CROSSWIND)				
CROSSWIND COMPONENT	18	36	6	24
10.5 KNOTS (12 MPH)	69.37%	35.85%	36.35%	68.31%
	91.02%		90.48%	
	99.22%			
13 KNOTS (15 MPH)	72.07%	37.07%	36.88%	72.70%
	94.92%		95.39%	
	99.77%			
16 KNOTS (18 MPH)	74.55%	38.39%	37.48%	75.49%
	98.69%		98.76%	
	99.95%			
20 KNOTS (23 MPH) (NA ARC C-III)	75.32%	38.66%	37.77%	76.19%
	99.73%		99.74%	
	99.99%			

IFR* WEATHER WIND ROSE (16 KNOTS CROSSWIND)				
CROSSWIND COMPONENT	18	36	6	24
10.5 KNOTS (12 MPH)	70.29%	34.14%	35.36%	68.00%
	90.79%		89.72%	
	99.16%			
13 KNOTS (15 MPH)	73.15%	35.30%	35.93%	72.72%
	94.79%		95.01%	
	99.75%			
16 KNOTS (18 MPH)	75.76%	36.54%	36.58%	75.74%
	98.63%		98.65%	
	99.94%			
20 KNOTS (23 MPH) (NA ARC C-III)	76.62%	36.79%	36.90%	76.48%
	99.72%		99.71%	
	99.99%			

SOURCE: National Climatic Data Center, Asheville, NC
 STATION: 72495 Napa, CA
 PERIOD: 1998 - 2001
 OBSERVATIONS: 2086

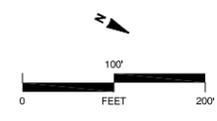
* - Ceiling less than 1,000' and/or visibility less than 3 SM.
 SOURCE: National Climatic Data Center, Asheville, NC
 STATION: 72495 Napa, CA
 PERIOD: 1998 - 2001
 OBSERVATIONS: 1728

NO.	REVISION	SPONSOR	DATE
NAPA COUNTY AIRPORT NAPA, CALIFORNIA DATA SHEET			
			
DESIGN:	DD/TT	DRAWN:	TE
DATE: March 2007		SHEET 2 OF 6	

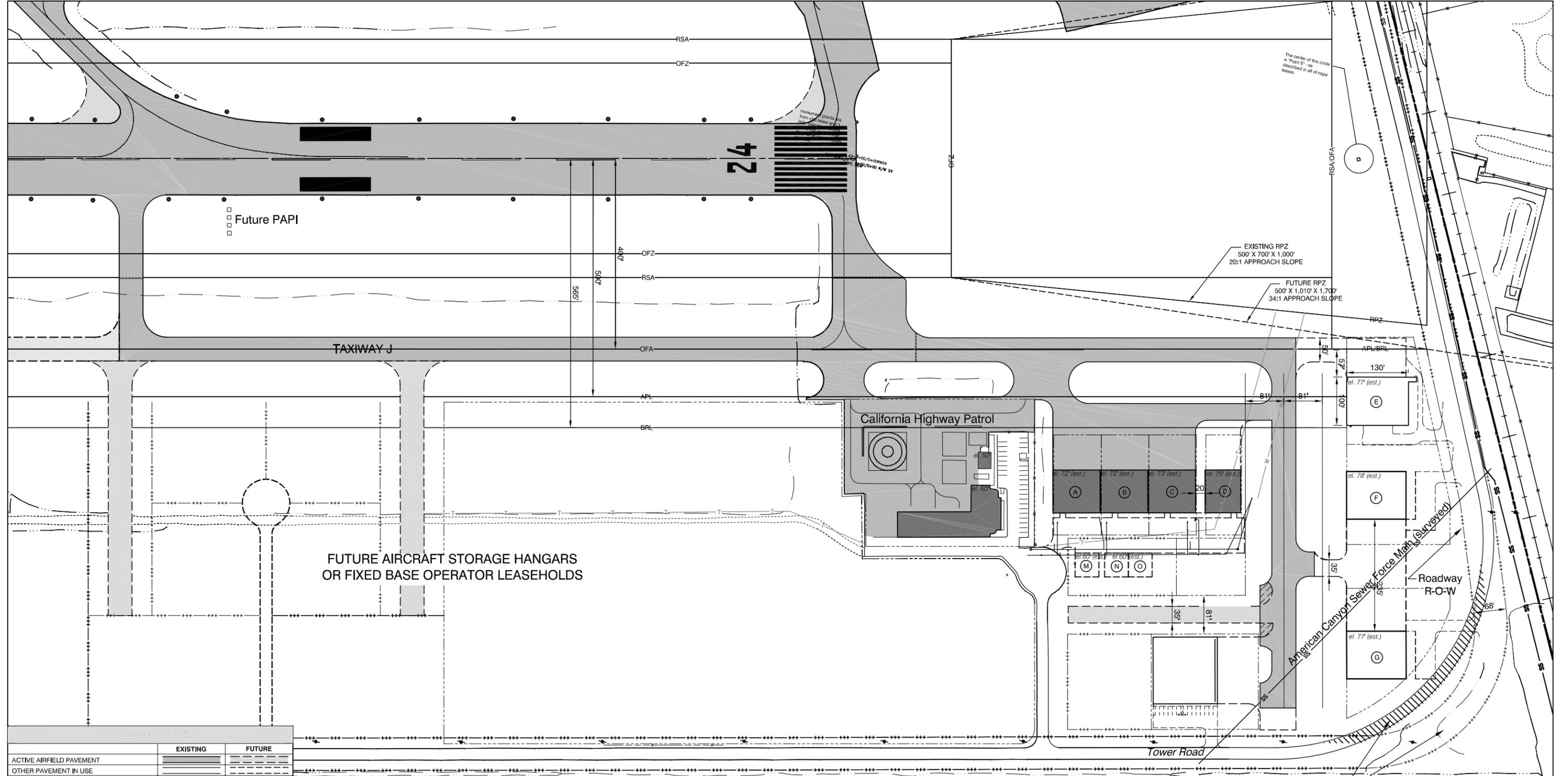


DRAWING LEGEND		
	EXISTING	FUTURE
ACTIVE AIRFIELD PAVEMENT		
OTHER PAVEMENT IN USE		
PAVEMENT TO BE REMOVED		
DIRT OR GRAVEL ROAD		
AIRPORT PROPERTY LINE		
OTHER PROPERTY LINES		
INTERNAL BOUNDARY (lease, R.O.W., etc.)		
CRITICAL AIRFIELD AREAS *		
BUILDING		
BUILDING ELEVATION		
FENCE		
AIRFIELD LIGHTS: SINGLE/GROUP/FLASHING		
UTILITY POLE / POWER LINE		
TOPOGRAPHIC CONTOURS		
WATERWAY / CULVERT		
CHANNEL		

* Applicable to the following:
 APL - Aircraft Parking Limits
 BRL - Building Restriction Line
 OFA - Obstacle Free Area
 OFZ - Obstacle Free Zone
 RPZ - Runway Protection Zone
 RSA - Runway Safety Area

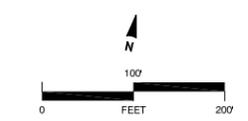


NO.	REVISION	SPONSOR	DATE
NAPA COUNTY AIRPORT NAPA, CALIFORNIA TERMINAL AREA PLAN			
		 <small>707 Aviation Blvd., Santa Rosa, California 95403 - (707) 526-9010</small>	
DESIGN:	DD/TT	DRAWN:	GJ
DATE:	March 2007	SHEET	3 OF 6

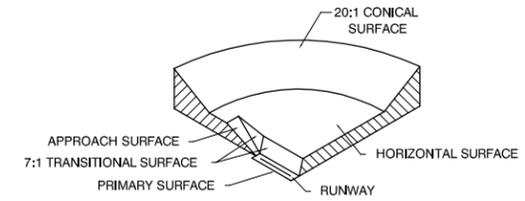
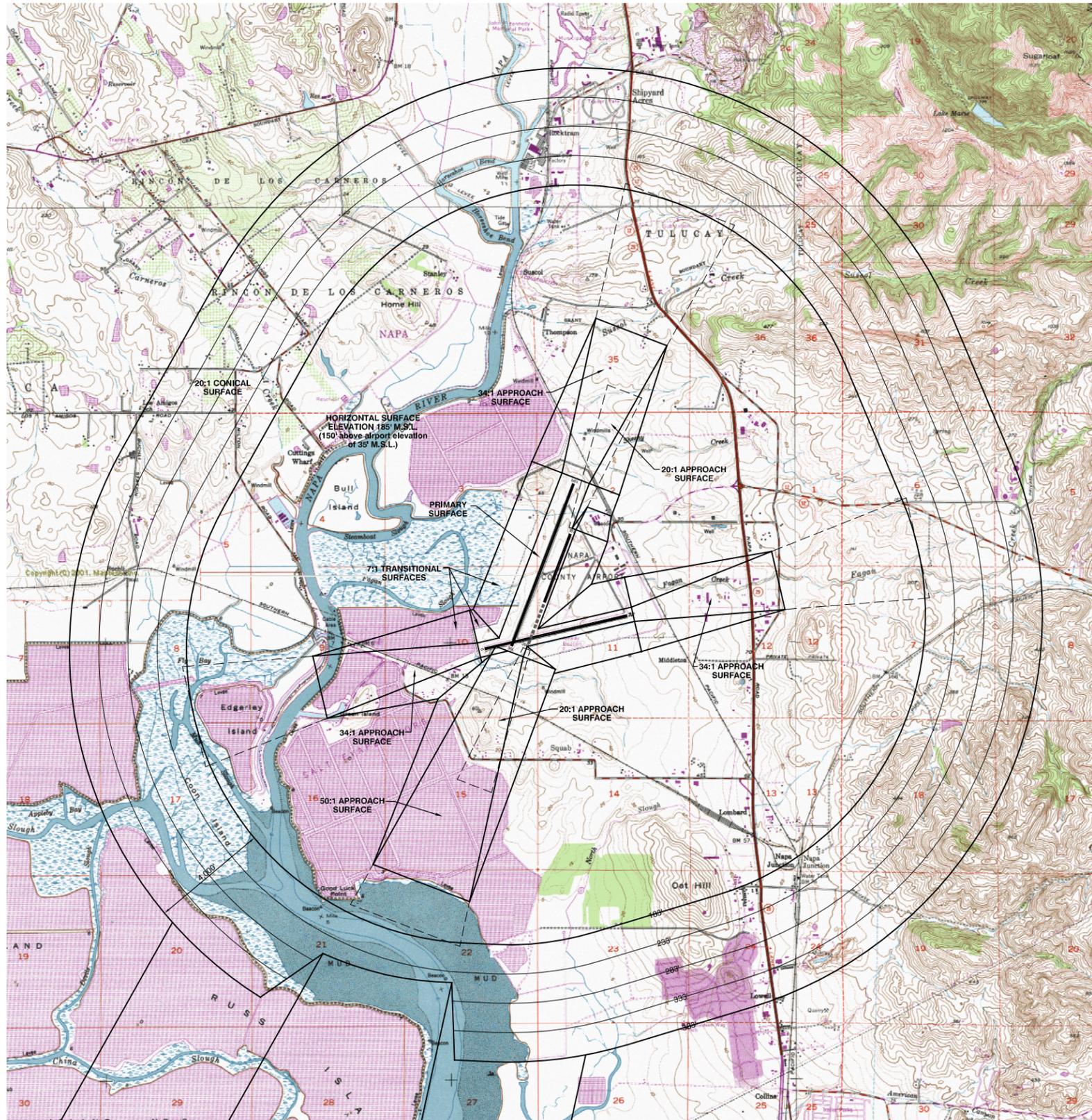


	EXISTING	FUTURE
ACTIVE AIRFIELD PAVEMENT		
OTHER PAVEMENT IN USE		
PAVEMENT TO BE REMOVED		
DIRT OR GRAVEL ROAD		
AIRPORT PROPERTY LINE		
OTHER PROPERTY LINES		
INTERNAL BOUNDARY (lease, R.O.W., etc.)		
LEASEHOLD IDENTIFIER		
CRITICAL AIRFIELD AREAS *		
BUILDING		
BUILDING ELEVATION	el. 70'	el. 70' (est.)
FENCE		
AIRFIELD LIGHTS: SINGLE/GROUP/FLASHING		
UTILITY POLE / POWER LINE		
TOPOGRAPHIC CONTOURS		
WATERWAY / CULVERT		
CHANNEL		

Applicable to the following:
 APL - Aircraft Parking Limits
 BRL - Building Restriction Line
 OFA - Obstacle Free Area
 OFZ - Obstacle Free Zone
 RPZ - Runway Protection Zone
 RSA - Runway Safety Area

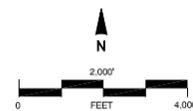


NO.	REVISION	SPONSOR	DATE
NAPA COUNTY AIRPORT NAPA, CALIFORNIA SOUTH SIDE BUILDING AREA PLAN			
		 <small>707 Aviation Blvd., Santa Rosa, California 95403 - (707) 526-9010</small>	
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DATE:	March 2007	SHEET	4 OF 6



TYPICAL FAR PART 77 SURFACES

= TERRAIN PENETRATES INDICATED SURFACE



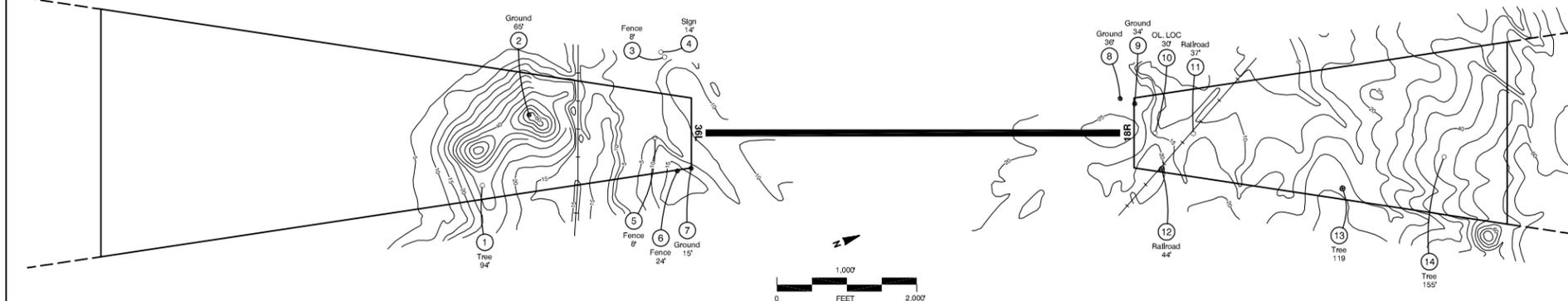
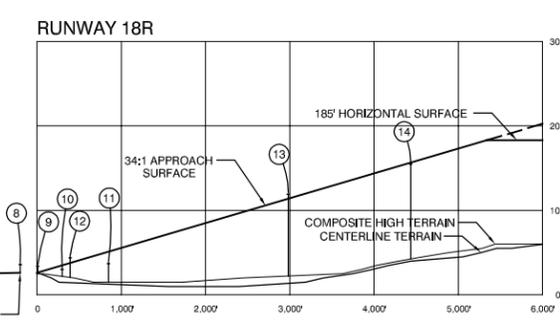
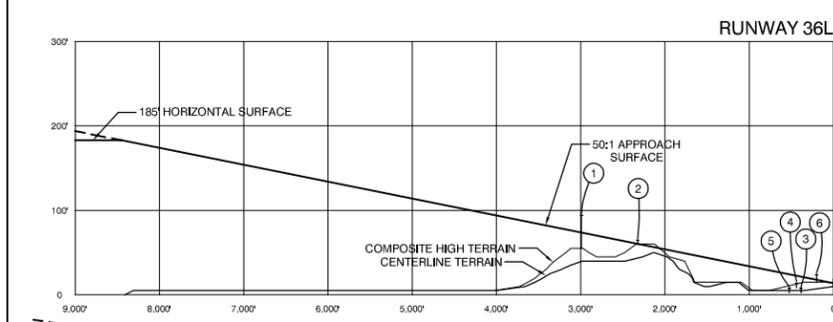
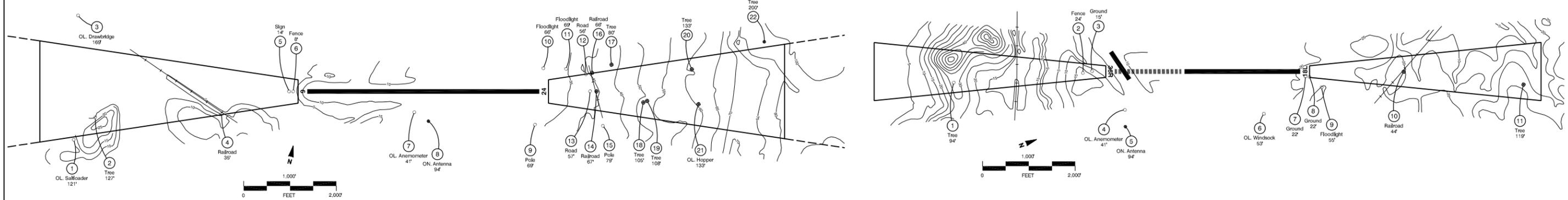
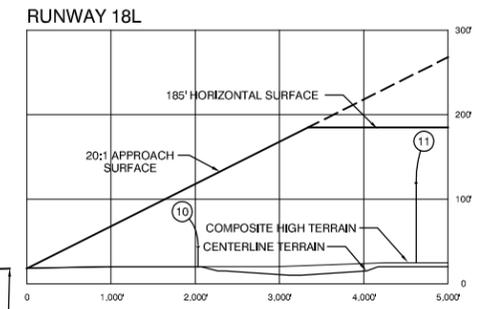
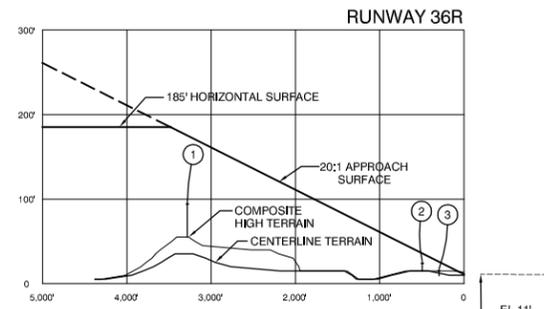
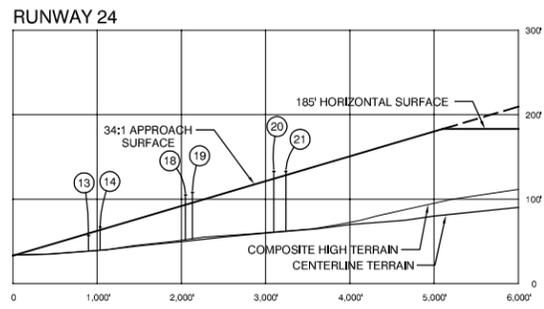
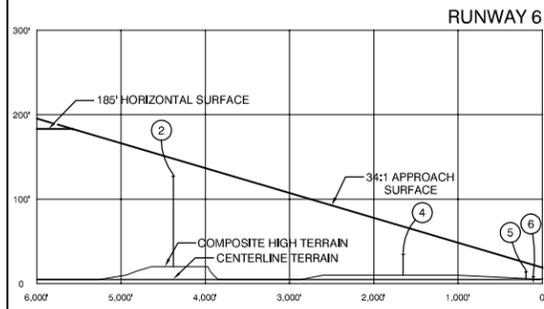
NOTES:

All elevations in feet above mean sea level (MSL) and NAVD88
See Approach Surface Detail Sheet (6 of 6) for obstruction data.

SOURCES:

Napa County Airport Obstruction Chart No. OC281
USGS Topographic Maps

NO.	REVISION	SPONSOR	DATE
NAPA COUNTY AIRPORT NAPA, CALIFORNIA			
AIRSPACE PLAN			
707 Aviation Blvd., Santa Rosa, California 95403 - (707) 526-5010			
DESIGN:	DD	DRAWN:	GJ
DATE:	March 2007	SHEET	5 OF 6



LEGEND

- = Object penetrates indicated surface
- = Object falls outside or below indicated surface
- ◐ = Object penetrates supplemental surface only
- * = 15 feet vertical clearance added to road elevations
- ** = 23 feet vertical clearance added to railroad elevations

NOTES:

All elevations in feet above mean sea level (MSL) and NAVD88

SOURCES:

Napa County Airport Obstruction Chart No. OC281
USGS Topographic Maps

NO.	REVISION	SPONSOR	DATE
NAPA COUNTY AIRPORT NAPA, CALIFORNIA			
APPROACH SURFACE DETAIL			
MEAD & HUNT		ENGINEERS ARCHITECTS SCIENTISTS PLANNERS	
<small>707 Aviation Blvd., Santa Rosa, California 95403 - (707) 526-6010</small>			
DESIGN: DD	DRAWN: GJ	DATE: March 2007	SHEET 6 OF 6