Yuba County Airport Master Plan Report

Prepared for
County of Yuba
Marysville, California

Adopted October 28, 2008

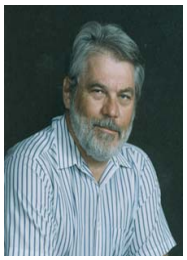
Yuba County

Board of Supervisors

Dan Logue
District One

John Nicoletti
District Two

Mary Jane Griego
District Three



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The preparation of this document was financed in part through a planning grant from the Federal Aviation Administration (FAA) as provided under Section 505 of the Airport and Airway Improvement Act as amended. The contents of this document do not necessarily reflect the official views of the FAA. Acceptance of this report by the FAA does not in any way constitute a commitment on the part of the United States to participate in any development depicted herein, nor does it indicate that the proposed development is environmentally acceptable in accordance with applicable public laws.

BEFORE THE COUNTY OF YUBA
BOARD OF SUPERVISORS

RESOLUTION ADOPTING A MITIGATED NEGATIVE DECLARATION AND MITIGATION MONITORING PLAN AND ADOPTION OF THE YUBA COUNTY AIRPORT MASTER PLAN REPORT

RESOLUTION NO. 2008-146

WHEREAS, the Yuba County Airport Master Plan Report has been prepared to guide long-term development of the Airport to meet the aviation needs of the community; and

WHEREAS, the Yuba County Airport Master Plan Report defines the Airport's role over the next twenty years and identifies future facility needs to support this role and meet projected demand; and

WHEREAS, the Yuba County Airport and Industrial Development Department of the County of Yuba has conducted an Environmental Initial Study for the proposed project and concluded that the project would not result in any significant adverse environmental impacts provided mitigation measures are implemented as project conditions of approval; and

WHEREAS, the Environmental Initial Study and draft Yuba County Airport Master Plan Report (dated December 2004, with an addendum dated April 2008) was released for public review and comment on September 3, 2008, with a comment period ending October 7, 2008; and

WHEREAS, the Yuba County Airport Master Plan Report will be submitted for review to the California Airport Land Use Commission to ensure consistency with the Yuba County Airport Comprehensive Lane Use Plan (CLUP); and

WHEREAS, the Yuba County Airport and Industrial Development Department of the County of Yuba has provided due notice for a public hearing before the Board of Supervisors of the County of Yuba with the intent to adopt a Mitigated Negative Declaration for the proposed project in accordance with the California Environmental Quality Act, as amended.

NOW, THEREFORE, BE IT RESOLVED AS FOLLOWS:

1. The foregoing recitals are true and correct.

2. The Board certifies that the Environmental Initial Study has been prepared as required by CEQA and is adequate.

3. The Board of Supervisors finds that the project will not cause substantial environmental damage to fish and/or wildlife and their habitats, nor have the potential for adverse effect(s) on wildlife resources or the habitat upon which wildlife depends. A Notice of Determination will be recorded with the County Recorder and Fish and Game Filing Fees will be paid to the County Recorder.

4. The Board of Supervisors hereby adopts the Mitigated Negative Declaration and Mitigation Monitoring Plan, and adopts the Airport Master Plan Report, subject to conditions of approval and mitigation measures incorporated herein by reference as though set forth in full.

PASSED AND ADOPTED this 28 day of October, 2008, by the Board of Supervisors of the County of Yuba, State of California, by the following vote:

AYES: Supervisors Logue, Nicoletti, Griego, Schrader, Stocker

NOES: None

ABSENT: None

ABSTAIN: None

Dan Logue, Chairman

ATTEST: Donna Stottlemeyer
Clerk of the Board of
Supervisors

Rachel Ferris, Deputy

RECEIVED

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MEAD & HUNT, INC.

The foregoing instrument is a Correct Copy of the original on file in this office ATTEST: DONNA STOTTLEMEYER Clerk of the Board of Supervisors of the County of Yuba, State of California

By Rachel Ferris, Deputy

Date: Oct 28, 2008

APPROVED AS TO FORM:

Pam Saremore, Deputy

Daniel G. Montgomery, County Counsel

Yuba County Airport Master Plan Report

Marysville, California

Adopted October 28, 2008

Prepared
for the
County of Yuba

Prepared by

www.meadhunt.com

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1

Background and Inventory

YUBA COUNTY AIRPORT

Yuba County Airport is a regional general aviation facility serving Yuba and Sutter counties and surrounding areas of north-central California. The airport is owned and operated by Yuba County.

Location and Environs

Yuba County Airport is located in north-central California, three miles south of central Marysville and some two miles outside of the city limits (Figure 1A). The boundary between Yuba and Sutter counties is situated just west of the airport and Yuba City, the area's largest city, lies immediately across the county line. Two small, unincorporated Yuba County communities, Linda and Olivehurst, are located within one to two miles to the airport's north and southeast, respectively.

Terrain in the immediate area of the airport, part of the Sacramento Valley, is level and generally between 55 feet and 65 feet above Mean Sea Level (MSL). The Feather River passes about a mile to the west and forms the Yuba/Sutter county boundary.

Automobile access to Yuba County Airport's main entrance is via Arboga Road which runs along the airport's eastern edge. State Highway 70 is situated less than a mile farther east, but connections to the airport are somewhat circuitous. Feather River Boulevard, another major local road, passes just to the west, but provides no direct airport access. Branch lines of the Union Pacific Railroad circle all but the south side of the airport.

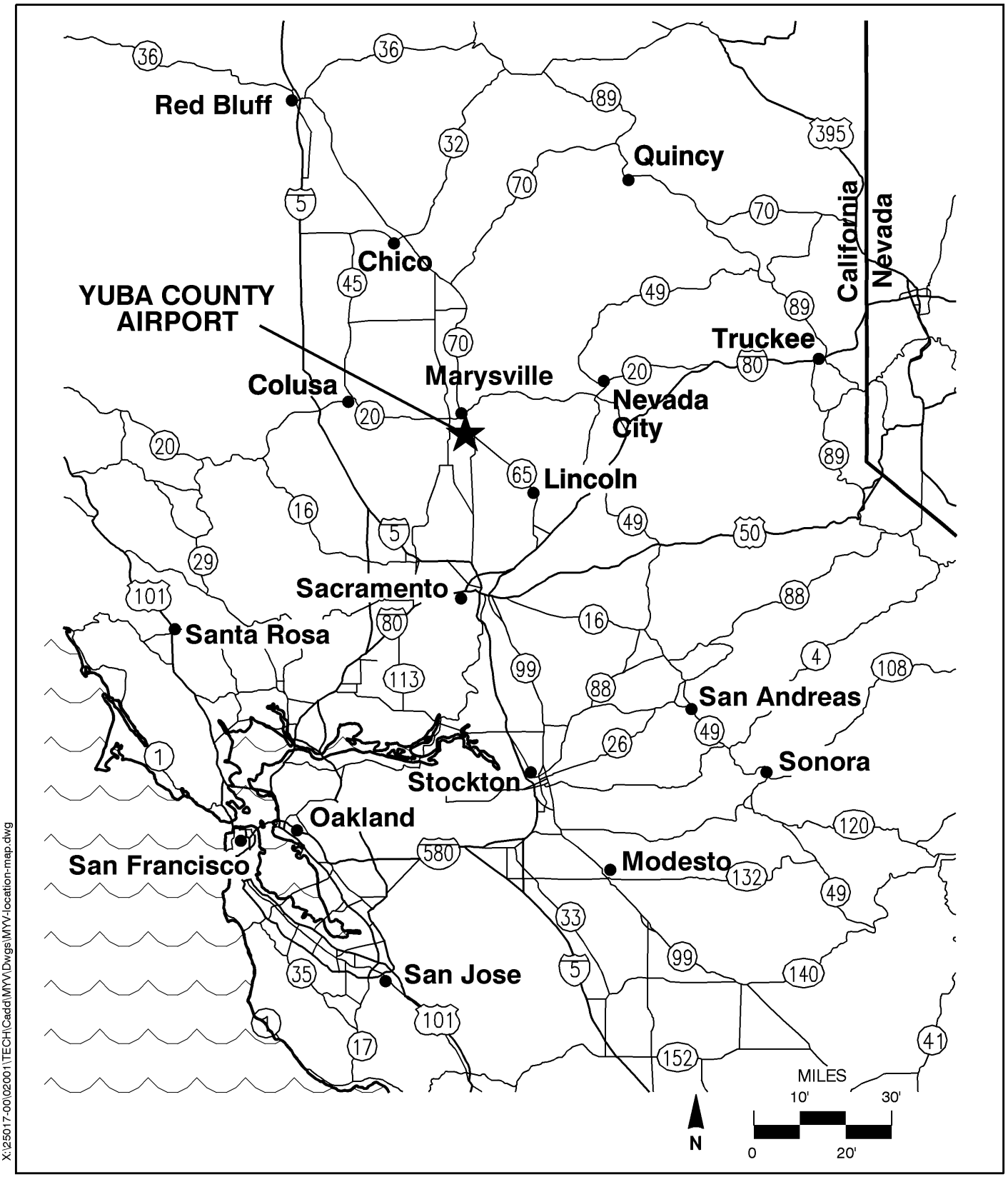


Figure 1A

Location Map

Yuba County Airport

Airport Development and Facilities

History

The inception of Yuba County Airport took place in 1940, when the Civil Aeronautics Board authorized funding for construction of an airport to be known as Alicia Airport. In January 1941, the County of Yuba and City of Marysville obtained title to the 833-acre site. Before the airport was opened, however, World War II intervened and the property was leased to the U.S. Government in March 1942. The U.S. Army Corps of Engineers completed the construction soon thereafter. "As-built" construction drawings from 1942 variously refer to the facility as "Marysville Airport" and "Ground Air Support Base near Marysville, California" while other sources indicate the airport was called "Marysville Army Air Field" or "Alicia Army Air Field." The facilities consisted of the two runways and the taxiway system as they exist today, together with a cluster of about a dozen small buildings and other facilities southeast of the runway intersection.

In November 1946, the City of Marysville deeded its half interest in the airport to the County of Yuba with the stipulation that it be maintained and operated as an airport. Almost a year later, the U.S. Government, through the War Assets Administration, declared the "Marysville Army Air Field (Alicia)" to be surplus property. The declaration cancelled the lease between Yuba County and the U.S. Government, thus returning the property to the county together with all improvements. In September 1949, the State of California issued a permit for the airport enabling it to operate as a public-use facility.

In 1953, the County received approval through Public Law 311, 81st Congress, to remove the restriction that excluded the use of any of the airport properties for manufacturing or industrial purposes. Obligations to the federal government remained, however. Official release of additional airport lands under the Surplus Property Act of 1944 did not occur until 1976 and 1980.

Among other milestone events in the history of Yuba County Airport are the following:

- The first two T-hangar structures were built in 1953. Others were added in 1979 and mid 1990s. Most recently, a large "executive hangar" building was completed in 2003. The older maintenance hangars date from the war and were moved to their present sites from elsewhere on the airport.

- Taxiway C, in the northeast corner of the airport, was used as a drag strip during the 1960s and 1970s.

- Beginning in 1960, commercial airline service was offered by Air West. A portion of the existing, now closed, restaurant building was used as the terminal. The apron area at the intersection of Taxiways A and B was constructed in 1968 to serve as an airline ramp. Airline service was discontinued in 1969.

- The FAA air traffic control tower began operation in 1974 and continued until 1981 when numerous towers across the country closed as a result of a controllers strike and were never re-opened. The Flight Service Station remained active until being forced to close on March 17, 1997, as one of the last in California to be replaced by automated Flight Service Stations and regional facilities.

- The Runway 14 Instrument Landing System (ILS) was installed in 1980 and the approach lighting system added in 1983. A high-intensity runway lighting system was installed in 1982, replacing the original World War II lighting.

- In July 1976, 168 acres of the original airport property were deemed excess to aviation needs and formally released by the FAA from all obligations to the federal government. An additional 96 acres were released in April 1980. The FAA no longer considers this land to be airport property and no improvements there are eligible for federal grants. Most of the released land has become a series of industrial parks, although one area contains aircraft hangars. The county sold the majority of the industrial park parcels—approximately 155 acres—to private parties. The remainder of the released land continues under county ownership, either as industrial park parcels that have been or could be leased or as road rights-of-way. Revenues from both the leases and sales are invested back into airport capital improvement projects.

Facilities

The basic configuration of Yuba County Airport has remained essentially the same since the airport's original construction, although the property boundaries have changed considerably.

A summary listing of the major facilities found at Yuba County Airport is presented in Table 1A.

The airport has two runways: a 6,006-foot primary runway (14-32) oriented roughly north/south; and a 3,281-foot secondary runway (5-23) aligned approximately east/west. The primary runway offers complete precision instrument approach capabilities and can accommodate the largest corporate jet aircraft. Aircraft parking and all other major building area facilities are located in the southeast quadrant formed by the intersection of the two runways.

Table 1B lists the tenants occupying property within the airport business parks as of early 2008.

MAJOR FEATURES

Property

- County of Yuba owns 605 acres of airport property in fee (following release pending in 2008); controls avigation easements on 319± acres
- 319 acres former airport property released by FAA for nonaviation use (including pending release)

Airfield

- Airport Elevation: 62 feet above Mean Sea Level (MSL)
- Runways
  - Runway 14-32: 6,006 feet long, 150 feet wide; asphalt
  - Runway 5-23: 3,281 feet long, 60 feet wide (reduced from original 4,000 feet long, 150 feet wide); asphalt
- Lighting
  - Runway 14-32: High Intensity Runway Lights (HIRL)
  - Runway 14 approach end: approach lights (MALSR); Runway End Identifier Lights (REILS)
  - Runway 5-23: None

Navigational Aids

- Airport: Rotating beacon; segmented circle & wind cone
- Runway 14: ILS (glide slope; localizer; middle marker; outer marker)
- Runways 14- 32: VASI (3.0°); wind cone (unlighted)

Building Area

- Runways divide building area into four quadrants; all on-airport facilities in southeast quadrant
- Aircraft Parking Capacity
  - Hangar Spaces: ± 93
  - Tiedowns: ± 77 (based and transient)
- Other Aviation-Related Buildings
  - Fixed Base Operations office/pilots lounge
  - Four maintenance hangars (one off-airport)
  - Terminal building/restaurant (not open)
  - Control Tower (county-owned; in use only for air show)
  - Airport administration offices
- Nonaviation Facilities
  - County Public Works Department storage
  - Sheriff's Department firing range
  - Various industrial uses (see Table 1B)

MANAGEMENT AND SERVICES

Management

- Airport Management and Maintenance: Yuba County Administrative Services Department

Fixed Base Operations Services

- Five FBOs (see Table 1B for list of services offered)
- Fuel: 100LL, Jet A; via truck only; operated by FBO during regular business hours

Emergency and Security

- Fire Protection: Olivehurst Fire Department
- Police: Yuba County Sheriff's Department patrols on routine basis

AIRPORT SITE AND ENVIRONS

Topography

- Airport elevation: 62 ft. MSL
- Airport land and nearby areas mostly flat
- Feather River 1 mile west

Access

- Via Arboga Road on east edge of airport
- State Highways 65 & 70 within 1 mile east, but no direct connection to airport

Jurisdictions

- Airport totally within unincorporated area of Yuba County
- Other Nearby Jurisdictions
  - Sutter County line: 0.6 miles west
  - Marysville city limit: 2 miles north
  - Yuba City limit: 1.4 miles west

Nearby Land Uses

- North: Community of Linda with mixed uses including residential, school (0.5 mi. northwest)
- East: Rail line; suburban residential in community of Olivehurst
- South: Small subdivision (at 0.7 miles); rural residential and agricultural elsewhere
- West: Rail line; Feather River; Yuba City residential area

AIR TRAFFIC PROCEDURES

Traffic Patterns

- All Runways: Left traffic
- Pattern Altitudes
  - Small aircraft: 1,062 feet MSL (1,000 feet AGL)
  - Turbine aircraft: 1,562 feet MSL (1,500 feet AGL)

Instrument Approach Procedures
(best visibility and descent height minimums)

- Runway 14
  - ILS: Straight-in (½ mile; 200 ft.)
  - GPS: Straight-in (½ mile; 399 ft.)
  - LOC: Straight-in (½ mile; 399 ft.)
- Runway 32
  - GPS: Straight-in (1 mile; 419 ft.)
  - VOR: Straight-in (1 mile; 479 ft.)
- All Runways
  - All of Above Procedures: Circling (1 mile; 478 ft.)

Communications

- CTAF/UNICOM: 123.05 MHz
- Sacramento Approach: 125.4 MHz
- Rancho Murieta FSS: 122.6 MHz
- Weather (ASOS): 118.47 MHz

Operational Restrictions / Noise Abatement Procedures

- None

Table 1A

Airport Profile

Yuba County Airport

FIXED BASE OPERATIONS (COMMERCIAL, AVIATION-RELATED SERVICES)

Name	Fuel Sales		Flight Instr'n		Aircraft Rental		Aircraft Parts & Maintenance					Aircraft Storage			Miscellaneous			
	100/100LL	Jet-A	Fixed Wing	Helicopter	Fixed Wing	Helicopter	Engine	Airframe	Avionics	Helicopter	Other	Based Tiedowns	Hangars	Transient Ramp	Pilots' Supplies	Charter (FAR 135)	Aircraft Sales	Other
Krueger Aviation *							X	X	X									
REACH Air Medical Services																		1
Red Carpet Aviation Services, Inc.	X	X	X		X		X					X		X	X			2
Schmidt Construction													X					
Yuba-Sutter Aviation*					X		X											

* Operates from private property adjacent to airport
1. Aeromedical helicopter operations base
2. Car rental

OTHER AVIATION-RELATED TENANTS ON AIRPORT

Name	Type of Business
Federal Aviation Admin.	Field sector office
National Weather Service	Weather observation equipment

OTHER AVIATION-RELATED BUSINESSES OFF AIRPORT

Name	Type of Business
A&P Helicopters	Aerial services; search & rescue
G.N. Dibble, Inc.	Crop dusting

NONAVIATION TENANTS ON AIRPORT (PROPERTY LEASES)

Name	Type of Business
American Composite	Fiberglass products
Jeanne's Catering	Catering service
Sky Harbor Cafe	Restaurant
Yuba County Animal Control	Animal care & management
Yuba County Road Dept.	Maintenance & eqpt. storage
Yuba County Sheriff's Dept.	Airport patrol; pistol range

Note:

All data as of April 2008

INDUSTRIAL PARK BUSINESSES (LEASED COUNTY PROPERTY)

Name	Type of Business
Christy Concrete Products	Concrete products
Coca Cola Bottling	Soft drink bottling
Continental Pacific Lumber	Master lessee
United Parcel Service	Small package shipping
Windsor Door	Steel overhead doors

INDUSTRIAL PARK BUSINESSES (FORMER AIRPORT PROPERTY)

Name	Type of Business
Acme Propane	Distribution facility
American Wood Fiber	Sawdust/mulch products
Arden Lumber	Wood products
Baldwin Contracting	Asphalt products
Classic Spas, Inc.	Swimming pool contractors
Concrete, Inc.	Concrete plant
East Coast Millwork	Millwork manufacturing facility
Hastie's Sand & Gravel	Landscaping materials; rock
Newton Saw & Tool	Mill supply and grinding
SMC Cabinets	Cabinet makers
U.S. Postal Service	Distribution & processing center

Table 1B

Airport Tenants

Yuba County Airport

Property surveys conducted as part of the present master plan study establish the airport property as comprising 605 acres. This total excludes previously released property and 55 additional acres proposed for release as described in Chapter 4. The latter area consists of road rights-of-way and drainage channels that do not primarily serve airport-related functions. The county-owned lands in the adjacent industrial parks are managed by the airport, but are not officially airport property.

The industrial parks, together with the airport itself, are part of the 70-square-mile Yuba-Sutter Enterprise Zone. Established in 1986, the zone is intended to foster economic growth by providing state tax benefits and local incentives to businesses that locate within the zone.

Management and Services

Policy decisions concerning Yuba County Airport are made by the Yuba County Board of Supervisors. Day-to-day operation and maintenance of the airport is under the auspices of the Administration Services Department. On-airport staff includes an airport manager, administrative assistant, and maintenance person.

Services to pilots and aircraft are primarily provided by a single major fixed base operation (FBO). Fuel (both 100LL and Jet A), transient aircraft parking, aircraft rental, flight instruction, engine maintenance, avionics repair, and automobile rental are among the services available. Four other FBOs offer more limited services including aircraft maintenance, helicopter services, and hangar rental. A crop duster operates at the airport from a facility located in the adjacent industrial park.

A listing of the airport FBOs and the services they offer is included in Table 1B.

Airport advisory (UNICOM) information is provided by the major FBO. Although a control tower building is located at the airport, it is operated only during the annual air show. FAA personnel man the facility during these occasions.

AERONAUTICAL SETTING

Area Airports

Nearby airports interact with Yuba County Airport in terms of both airspace, as described below, and shared service areas. In both respects, the greatest interaction is with Sutter County Airport located just across the Feather River, 3 miles northwest. Among the half dozen other airports within a 30-mile radius, Lincoln Regional, 18 miles southwest, is most comparable, having the same length runway, precision approach capabilities, and similar services.

See Table 1C for a listing of airports near Yuba County Airport.

		Location			Facilities					Services						
Airport Name [1]	**Owner**	**Associated City (County)**	**Distance/Direction** [2]	**Based Aircraft** [3]	**Number of Runways**	**Longest Runway (ft.)**	**Surface** [4]	**Lighting Intensity** [5]	**Approach Visibility** [6]	**Control Tower**	**Airline Service**	**AvGas**	**Jet Fuel**	**Maintenance**	**Automobile Rentals**	**Food**
Yuba County	***Yuba County***	***Marysville (Yuba)***	**–**	***102***	***2***	***6,006***	**asph**	**H**	**½**	**–**	**–**	**X**	**X**	**X**	**X**	**–**
Auburn Municipal	City of Auburn	Auburn (Placer)	28 SE	210	1	3,700	asph	M	1	–	–	X	X	X	–	X
Brownsville	Private (public use)	Brownsville (Yuba)	28 NE	12	1	2,326	grav	–	–	–	–	–	–	–	–	–
Colusa County	County of Colusa	Colusa (Colusa)	24 W	29	1	3,000	asph	M	1	–	–	X	–	X	X	–
Lincoln Regional	City of Lincoln	Lincoln (Placer)	18 SE	207	1	6,001	asph	M	½	–	–	X	X	X	X	–
McClellan	County of Sacramento	Sacramento (Sacramento)	30 S	80	1	10,600	conc	H	½	–	–	X	X	–	X	X
Nevada County	County of Nevada	Grass Valley (Nevada)	30E	128	1	4,350	asph	M	1	–	–	X	X	X	–	–
Oroville Municipal	City of Oroville	Oroville (Butte)	27 N	28	2	6,020	asph	M	1	–	–	X	X	X	–	X
Rio Linda	Private (public use)	Rio Linda (Sacramento)	30 S	163	1	2,620	asph	L	–	–	–	X	–	X	–	–
Sacramento Int'l	County of Sacramento	Sacramento (Sacramento)	28 S	5	2	8,601	conc	H	½	X	X	X	X	X	X	X
Sutter County	County of Sutter	Yuba City (Sutter)	3 NW	94	1	3,045	asph	M	–	–	–	X	–	X	–	–
Beale AFB	US Air Force (military)	Marysville (Yuba)	7 E	–	1	12,000	conc	H			not open to public					

[1] Airports within 30 statute miles of Yuba County Airport; private-use and restricted-use airports excluded
[2] Relative to Yuba County Airport
[3] FAA Airport Master Record data as of January 2007; totals exclude ultralights
[4] ASPH=asphalt; CONC=concrete; GRAV=gravel
[5] L=low; M=medium; H=high
[6] Minimums for instrument approach procedures; distance in statute miles

Table 1C

Area Airports

Yuba County Airport Vicinity

The nearest airline service airport is Sacramento International, 28 miles south. More limited airline service also is available at Chico Municipal, 50 miles north. One other airport of considerable significance to the local aeronautical setting is Beale Air Force Base situated 7 miles east. Part of the Beale controlled airspace overlaps Yuba County Airport.

Area Airspace

Yuba County Airport airspace is complicated to a moderate degree by the proximity of Sutter County Airport to the west and Beale Air Force Base to the east. To reduce air traffic conflicts with Yuba County Airport, the Sutter County Airport traffic pattern is limited to the west side of that airport.

Nevertheless, pilots approaching Yuba County Airport from the northwest or departing in that direction must be alert to air traffic at Sutter County Airport. Neither airport has surrounding airspace that requires aircraft to operate under FAA air traffic control although contact with Northern California (NorCal) Approach Control is encouraged because of the proximity of Beale AFB.

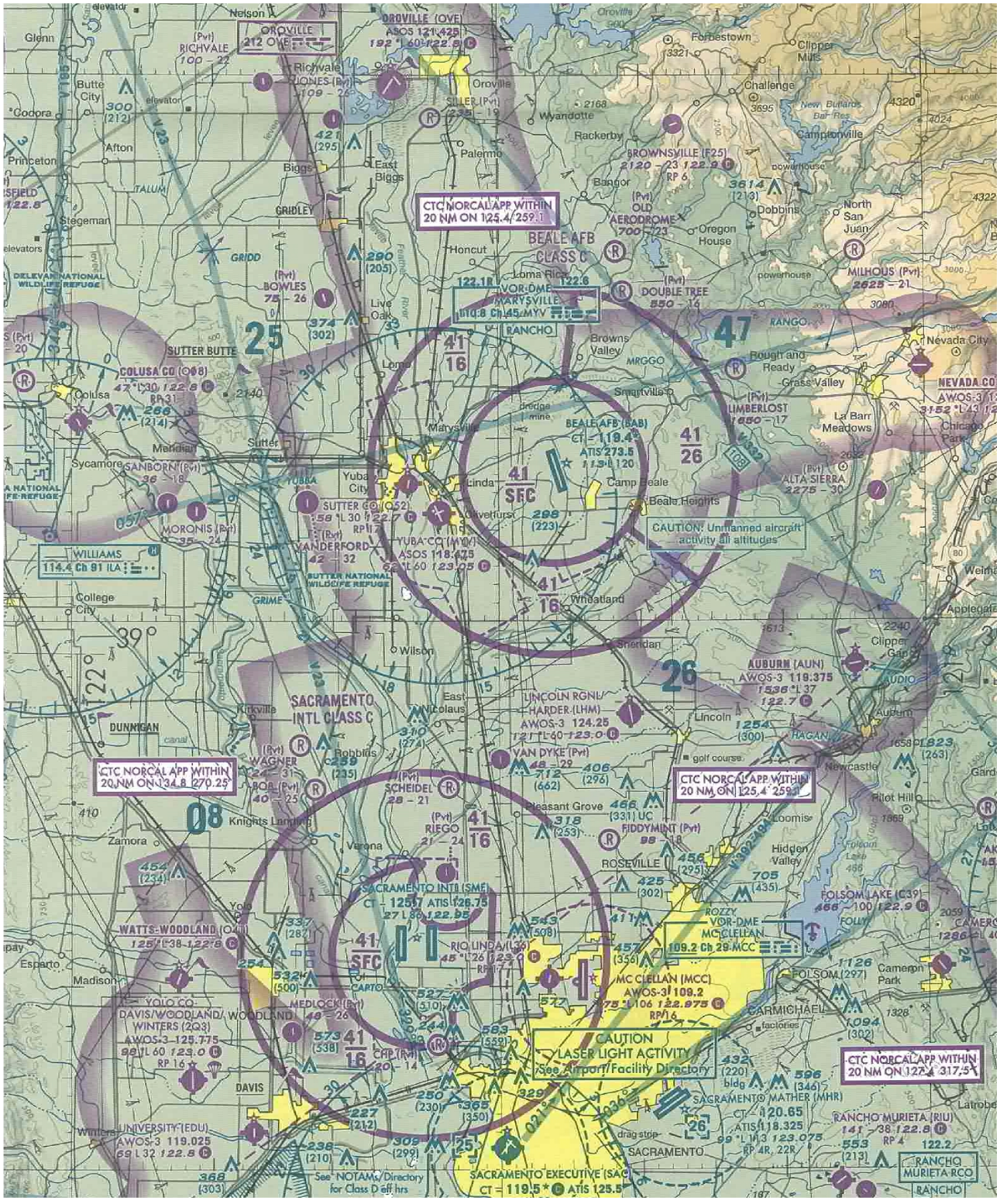
Controlled Class C airspace for Beale AFB extends 10 nautical miles outward from that airport. Within 5 nautical miles—barely over 1 nautical mile east of Yuba County Airport—the Class C airspace extends from 4,100 feet MSL down to ground level. Aircraft operating in the Class C airspace must be in contact with controllers. Over the Yuba County and Sutter County airports, the Class C airspace extends down only to 1,600 feet MSL, thus allowing aircraft to use these airports without talking to air traffic control. Also overlying Yuba County Airport except where Class C exists is an extensive area of Class E airspace. The latter airspace begins at 700 feet above the ground and reaches upward to 18,000 feet MSL. Below 700 feet, the airspace is considered uncontrolled. Visual flight rules for operating in Class E versus uncontrolled airspace primarily involve visibility minimums, not contact with air traffic controllers (however, aircraft operating under instrument flight rules in Class E are required to be in contact with controllers).

Figure 1B reproduces the portion of the FAA Aeronautical Chart for the Yuba County Airport area.

COMMUNITY PROFILE

As further detailed in Chapter 2, the community served by Yuba County Airport consists not just of Marysville and surrounding areas of Yuba County, but also Sutter County and, to a lesser extent, portions of other adjacent counties. Historically, the economy of the Yuba/Sutter County area has centered around agriculture. Today, agriculture and food processing—with rice and orchard crops being the leading commodities—continue to be important, but the local economy also is becoming more diversified.

Demographic and other information about the communities Yuba County Airport serves is summarized in Table 1D.



Source: San Francisco Aeronautical Chart (September 2008)

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Figure 1B

Area Airspace

Yuba County Airport

GEOGRAPHY

Location

- Yuba and Sutter counties located along eastern side of Sacramento Valley in north-central California
- City of Marysville, Yuba County seat and one of two incorporated cities, lies along western edge of county adjacent to Sutter County line 40 miles north of Sacramento and 100 miles northeast of San Francisco
- Yuba City, county seat of Sutter County, located immediately west of Marysville
- Yuba County Airport located 3 miles south of central Marysville

Topography

- Feather River forms Yuba/Sutter county line and boundary between the cities of Marysville and Yuba City
- Airport area mostly flat valley floor; airport elev. 62 ft. MSL
- Eastern portion of Yuba County rises into Sierra foothills

SURFACE TRANSPORTATION

Major Highways

- Four state highways serve Marysville/Yuba City area:
  - Hwy 20: through both cities east to Nevada County, west to Colusa
  - Hwy 65: from Marysville southeast to Lincoln
  - Hwy 70: through Marysville north to Oroville and Chico, south toward Sacramento
  - Hwy 99: through Yuba City north to Chico, south to Sacramento
- Segments in urban areas are freeway or expressway; other portions mostly 2-lane, undivided
- Nearest interstate highways:
  - I-5: 40 miles west via Hwy 20 or 35 miles south via Hwy 70 and 99
  - I-80: 35 miles southeast via Hwy 65 or 40 miles south via Hwy 70 or 99

Railroads

- Union Pacific Railroad operates three rail lines through Yuba and Sutter counties; all three lines pass within a mile of Yuba County Airport
  - Two major lines connecting Sacramento with points north and northeast
  - Third is little-used industrial spur line wrapping around north and west sides of airport

Public Transportation

- Yuba-Sutter Transit operates throughout area:
  - Local routes in Marysville/Yuba City areas, but not directly to Yuba County Airport
  - Regional routes connecting to Sacramento and Lincoln
- Airport Transportation Service offers van service to Sacramento International Airport
- Greyhound Lines has north/south route through Marysville

POPULATION AND ECONOMY

Current/Historical Population

	1990	*1995*	*2000*	*2007*
Yuba County	58,228	61,900	60,219	70,745
Sutter County	64,415	73,500	78,930	93,919
City of Marysville	12,324	12,500	12,268	12,713
City of Yuba City	27,385	34,100	36,758	62,083

(Source: California Department of Finance)

Projected Population

	2010	*2020*	*2030*
Yuba County	80,410	109,216	137,322
Sutter County	102,326	141,159	182,401

(Source: California Department of Finance)

Basis of Economy

- Economy historically based on agriculture (rice, orchard crops, cattle); increasingly diversified today; Beale AFB represents significant contribution
- Major employment by industry in two-county area (2002):
  - Government 24%
  - Trade, Transportation, Utilities 19%
  - Education, Health Services 11%
  - Agriculture 11%
  - Leisure, Hospitality 8%
  - Manufacturing 8%

(Source: California Economic Development Department)

CLIMATE

Temperature

	Avg. High	*Avg. Low*
Hottest month (July)	96.2°F	61.7°F
Coldest month (January)	54.0°F	37.8°F

Precipitation and Fog

- Average annual rainfall in Marysville: 21.6 inches
- Fog: visibilities below 1 mile and cloud ceiling below 1,000 feet (instrument flight conditions) occur 4% of year

Winds

- Prevailing winds from south/southeast and north/northeast (see Figure 3B in Chapter 3)

Table 1D

Community Profile

Yuba County Airport

With Beale Air Force Base as a significant contributor, government accounts for the largest share of employment in the region. Construction, transportation and public utilities, and manufacturing are projected to be among the fastest growing employment categories in the coming years (source: California Employment Development Department). To a major extent, this economic growth reflects the outward expansion of the Sacramento metropolitan area.

Population growth in the two-county area is also projected to be strong, especially in Sutter County. Having already increased at a healthy rate of nearly 1.4% per year from 1990 to 2003, Yuba and Sutter counties are forecasted to have nearly a 1.8% annual growth rate from 2003 to 2020. Sutter County's growth rate is projected at almost 2.0% per year. By comparison, the projected statewide population increase over this period is projected at 1.5% per year. (Source: California Department of Finance)

PREVIOUS AIRPORT PLANS AND STUDIES

Two comprehensive master plan studies and numerous updates of the airport layout plan drawing have previously been prepared for Yuba County Airport. The master plan studies were completed in 1970 (by International Engineering Company) and in 1986 (by CH2M Hill).

The 1970 plan dealt extensively with accommodation of passenger airline activity, discontinued during the plan's preparation, as well as a volume of total aircraft operations that were projected to increase from about 69,000 in 1968 to nearly 170,000 in 1980. The number of based aircraft was expected to rise from 64 to about 140 over this period. The 1986 plan likewise anticipated a commuter airline function at the airport even though no such service had operated there since 1969. Based aircraft were projected to more than double from almost 100 in 1985 to over 200 in 20 years. Total aircraft operations, then at about 65,000, were forecast to reach 127,000 in 2005.

To accommodate these aviation demands, both master plans recommended southward extension of the primary runway and construction of a west-side parallel runway for general aviation use. Major redevelopment of the core building area was proposed as well. Each plan calls for construction of a new airline terminal building together with new hangars for based aircraft.

The periodic updates to the airport layout plan drawing have primarily reflected changes in existing conditions at the airport and not any major new proposed development different from that indicated in the master plan documents.

Another important plan concerning Yuba County Airport is the *Comprehensive Land Use Plan* adopted by the Sacramento Area Council of Governments (SACOG) in 1994. SACOG serves as the airport land use commission for Yuba and three other counties in the Sacramento region. The purpose of the compatibility plan is to help prevent development of incompatible land uses around the airport. It does not contain recommendations regarding improvement or operation of the airport itself.

2

Airport Role and Activity Forecasts

2

Airport Role and Activity Forecasts

AIRPORT ROLE

Present

Yuba County Airport is one of two public-use airports located in Yuba County. It is the principal general aviation airport serving not just Yuba County, but also neighboring portions of Butte, Nevada, Placer, Sacramento, and Sutter counties. In this capacity, the airport is an essential component of the region's transportation system. The key role played by Yuba County Airport is documented in both the federal and state airport system plans.

The Federal Aviation Administration's (FAA) *National Plan of Integrated Airport Systems* (NPIAS) includes the airport as a "general aviation airport." The NPIAS defines a general aviation airport as an airport that does not have scheduled commercial passenger service and is not located in a major metropolitan area. These airports accommodate the aviation needs of communities outside major metropolitan areas. They are particularly important in providing for air transportation in more rural areas. According to the NPIAS, general aviation airports are the most convenient source of air transportation for approximately 19% of the United States population.

The NPIAS identifies existing and proposed airports that are significant to the national air transportation system. It contains estimates of costs of airport development projects eligible for federal aid that are needed to meet aviation demand over the next five years. The latest NPIAS available during preparation of the *Yuba County Airport Master Plan* covers the 2001-2005 period.

The Yuba County Airport is also included in the *California Aviation System Plan* (CASP). The 1998 CASP Inventory Element classifies the airport as Regional-Business/Corporate. This classification is defined as follows:

- **Community Airports**—Airports that provide access to other regions and states; located near small communities or in remote

locations; serve, but are not limited to, recreation flying, training, and local emergencies; accommodate predominately single engine aircraft under 12,500 pounds; provide basic or limited services for pilots or aircraft.

- **Regional Airports**—Airports that provide the same access as Community airports; may provide international access; located in an area with a larger population base than Community airports while serving a number of cities or counties; serve the same activities as Community airports with a higher concentration of business and corporate flying; accommodate most business, multi-engine and jet aircraft; provide most services for pilots and aircraft including aviation fuel; have a published instrument approach; may have a control tower.

- **Business/Corporate**—The use of an airport by aircraft by an individual for transportation required by a business in which the individual is engaged (the pilot is not compensated); or the use of an airport by aircraft owned or leased by a company to transport its employees and/or property (professional pilot is compensated).

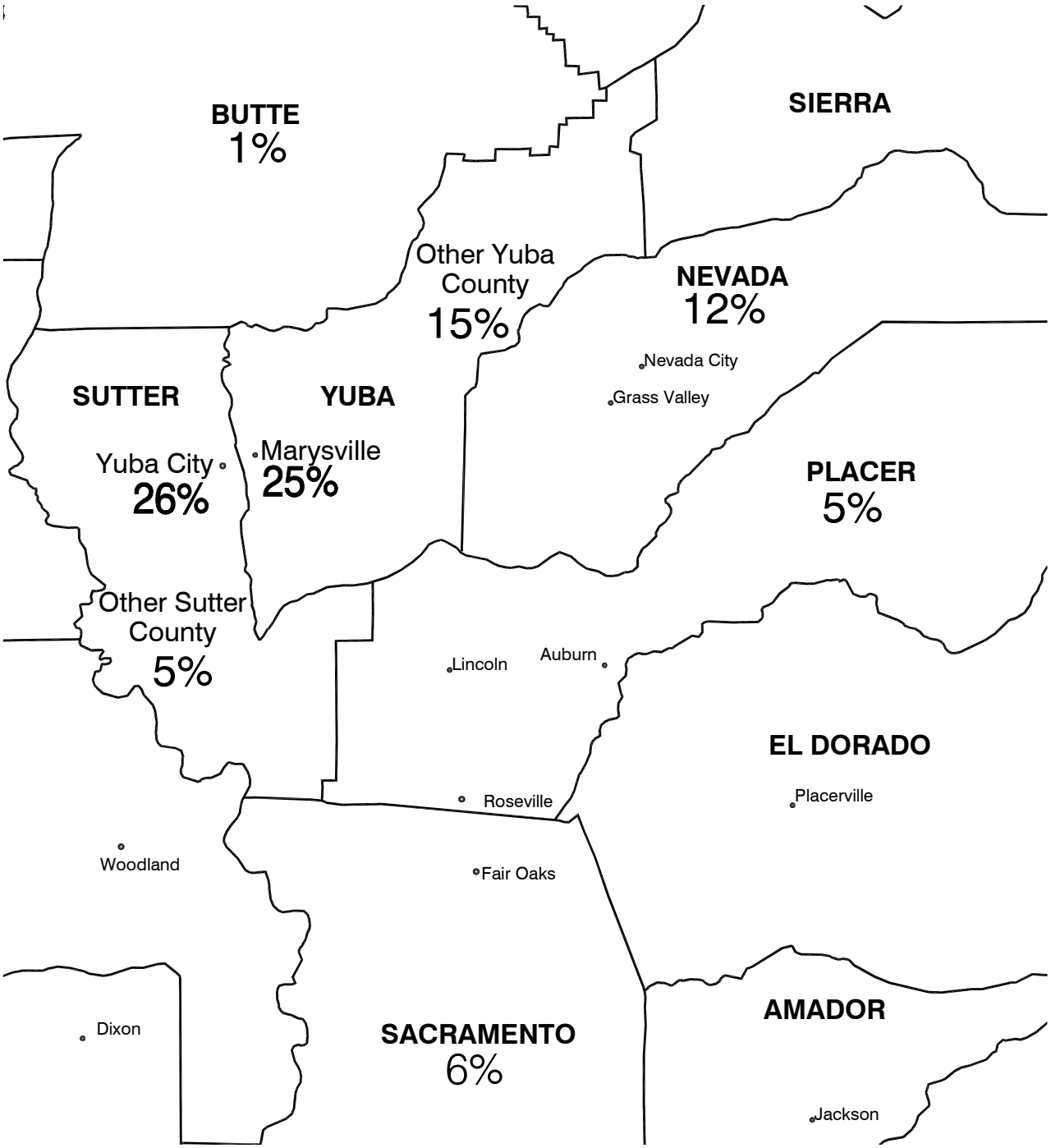
Particular characteristics of Yuba County Airport's NPIAS and CASP roles include:

Figure 2A depicts the local service area of Yuba County Airport as represented by the distribution of addresses of the airport's based aircraft owners. As can be seen, about half of the aircraft are registered to owners with Marysville or Yuba City addresses. Most of the remainder are distributed among owners from adjacent counties.

- **A Base for Area Pilots**—For many pilots who live and work in the area, the Yuba County Airport is the closest and most convenient airport from which to fly. Additionally, many Yuba City resident pilots base their aircraft at Yuba County Airport, rather than at the nearby Sutter County Airport, because of the longer runway and instrument landing system. Corporate, personal business, pleasure/recreation, and flight training are the predominate aviation uses of the airport.

- **A Point of Air Access for Visitors to the Area**—Yuba County contains numerous recreational opportunities. The area includes Bullard's Bar Dam and reservoir, Collins Lake, and over 25,000 acres of National Forest land. The county contains numerous hunting clubs. Historic sites include Timbuctoo, Camptonville, Camp Far West, and Strawberry Valley. The County Sports and Entertainment Zone, 5 miles southeast of the airport, features an amphitheater with fixed and lawn seating for up to 18,500 people. The airport provides access to these opportunities for visitors choosing to travel using general aviation aircraft.

- **A Place to Conduct Aviation Related Business**—Yuba County Airport is an important place of business. Four aviation-related businesses, employing approximately 14 people, are



MYV–based–aircraft–amp

Figure 2A

Geographical Distribution of Based Aircraft

Yuba County Airport

located on the airport. These businesses offer a wide range of general aviation services to based and transient aircraft owners and pilots.

- **A Base for Aerial Agricultural Operations**—The airport is the base for one agricultural aviation service. Several other agricultural operators use the airport on a transient basis. These operators provide services such as aerial seeding and pesticide application.

- **A Base for Aviation- Related Community Emergency Services**—The airport is critically important for access for emergency medical transportation, search and rescue operations, law enforcement operations, and other emergency services.

- **An Industrial Base for the Community**—Yuba County Airport is surrounded by eight industrial parks comprising 265 acres of prime corporate and industrial sites. As of early 2008, there are some 16 businesses within these parks. In addition, there are four non-aviation businesses located on the airport that employ approximately 45 people.

Future

This *Master Plan* anticipates that the roles of Yuba County Airport will remain much the same over the planning period. The emphasis will continue to be on general aviation and the development of facilities to accommodate general aviation demand, particularly business use. This view of the airport's future roles are consistent with that indicated in both the NPIAS and CASP.

Because of the proximity of the Chico Municipal Airport to the north and the Sacramento International Airport to the southwest, scheduled commercial air carrier passenger service is fairly convenient to area residents. For this reason, and other considerations described below, scheduled passenger service is not anticipated at the Yuba County Airport within the planning period. As also discussed below, similar factors affect the potential for establishment of air cargo service. These conclusions notwithstanding, the potential to accommodate possible future commercial passenger and cargo uses should be retained to the extent practical so that, should those uses be proposed in the future, they can be accommodated.

General Aviation

The current nationwide trend in general aviation is toward slow overall growth. An exception to this trend is in business/corporate aviation. The FAA expects this sector to grow strongly over the next decade and beyond. With the increased time and difficulty of

traveling on commercial air carriers due in part to increased security measures, many businesses and corporations are turning to general aviation to meet their air travel needs. Business/corporate aircraft ownership is growing, as are traditional air charter and fractional ownership programs. In addition, the recent introduction of smaller Very Light Jets (VLJs) and sophisticated single-engine turboprop airplanes is expected to further stimulate the fleet growth and the use of business/corporate aircraft.

Yuba County Airport is well-positioned to take advantage of this projected growth in business aviation. Situated on the northern edge of the expanding Sacramento metropolitan area, the airport's service area is experiencing rapid growth in population and economic development. Large tracts of land around the airport are set aside for industrial uses.

Other segments of general aviation will also continue to do well at Yuba County Airport. Population and economic growth rates above the national average will be one contributing factor to this trend. Additionally, the airport has ample land to accommodate growth in based aircraft parking, supporting commercial aviation services, and other general aviation functions that are part of the airport's present roles.

Scheduled Passenger Service

Scheduled commercial airline passenger service has been offered at Yuba County Airport in the past. Hughes Airwest operated there from approximately 1960 through 1967. Later, Eureka Aero sporadically provided commercial service until 1977. There has been no scheduled commercial service since then.

As stated earlier, reestablishment of scheduled commercial passenger service airline at the airport is regarded as unlikely. The following factors lead to this conclusion:

- Scheduled commercial service is available at the Chico Municipal Airport, approximately an hour's drive to the north.
- Sacramento International Airport, approximately a 45-minute drive to the southwest, provides extensive scheduled commercial service.
- The airline industry has substantially rebounded since the downturn in commercial passenger travel subsequent to the terrorist attacks on September 11, 2001. However, continuing increases in the cost of fuel have somewhat altered the airline industry's air service patterns. Even though regional carriers that might serve smaller communities such as Yuba County are adding planes, commercial service to these communities remains a financial challenge and this status is likely to continue for the

foreseeable future. Also a factor is that federal safety and security standards would have to be met for airline service to be established at an airport that is not currently served.

- Federal airport safety and security regulations that govern air transportation of passengers and cargo do not currently apply to Yuba County Airport. As described in Chapter 4, the county would incur significant capital improvement costs and on-going operations costs to meet these requirements.

Air Cargo Service

The air cargo industry continues to be a growing segment of aviation. Although air cargo revenue ton-miles grew at an annual average rate of approximately 8% percent over the last 30 years, according to Boeing Company research, the industry took a downturn in 2000 and 2001. That downturn was attributed to the slumping economy in Asia and the United States. However, the Boeing Company reports growth of 2% to 3% in 2002, and projects that air cargo will triple over the next 20 years. (Source: *Boeing World Air Cargo Forecast, 2002/2003*)

In 1997, the Yuba-Sutter Economic Development Corporation (YSEDC) contracted with Shutt Moen Associates to prepare a preliminary analysis of the Yuba County Airport to determine what improvements would be needed to support large air cargo jet aircraft. In order to improve the area's industrial base, YSEDC sought to encourage commercial air cargo operations at the airport. The report, entitled *Airport Infrastructure/Engineering Analysis, Potential Accommodation of Commercial Air Freight Operations at Yuba County Airport,* identified improvements that would be needed to accommodate McDonald Douglas DC-9 and Boeing 727 size air cargo aircraft. The report identified the following necessary improvements:

- Runway 14/32 extension and strengthening;
- Taxiway system upgrades;
- Instrument approach capability upgrades;
- Air Traffic Control Tower improvements and recommissioning;
- Apron expansion;
- Construction of cargo handling facilities;
- Ground access improvements;
- Land acquisition and relocation of residences and businesses.

The report estimated the known costs of these improvements at approximately $9 million and identified future additional estimated costs that were not known at the time.

Since completion of the report in 1997, Sacramento Mather Airport, formerly Mather Air Force Base, has become the primary air cargo service airport in the Central Valley. With a 150-foot wide, 11,300-foot long runway, Category I instrument landing system (proposed to be upgraded to Category II), acres of usable aircraft parking apron, and a functioning Air Traffic Control Tower, Mather offers the facilities required by commercial air cargo operators. Because of its superior facilities, Mather is anticipated to continue to be the primary air cargo airport for the region throughout the timeframe of this *Master Plan*.

A more realistic air cargo scenario for Yuba County Airport is feeder service. Most air cargo operators utilize feeder routes—flown with smaller aircraft such as large single engine and small twin engine propeller aircraft—to transport cargo from outlying areas to their cargo hub. As the Yuba County industrial parks develop, the need for this feeder service at the airport could arise. Given the type of aircraft involved, no modifications to the existing airfield would be necessary. Building area facilities that might be required are described in Chapter 4.

HISTORICAL AIRCRAFT ACTIVITY

Based Aircraft

Although historical data on the number of aircraft based at Yuba County Airport is incomplete, the available data suggests that the based aircraft count has remained fairly constant since 1984. There were approximately 101-based aircraft in 1984 compared to 107 at the end of 2000. A comprehensive count conducted in mid 2003 as part of this *Master Plan* study found 102 aircraft to be based at the airport. Except for eight new units completed in early 2008, new hangar capacity has not been provided. This shortcoming has continued to limit the growth in based aircraft. The count remains about the same due in large part to the lack of additional hangar capacity.

The based aircraft fleet mix has varied only slightly in recent years. The typical distribution is approximately 90% single-engine airplanes, 5% twin-engine airplanes, small business jets, and helicopters, and 5% other aircraft such as ultralights or gyroplanes.

As depicted in Figure 2A earlier in this chapter, Yuba County residents and businesses represent the largest group (40%) of based aircraft owners. Another sizable group, approximately 31%, are Sutter County residents, mostly from Yuba City.

Transient Aircraft Parking

The demand for transient aircraft parking varies significantly on a day-to-day basis. An estimate derived from tiedown fee data and observations by county staff and fixed base operator (FBO) employees, indicates that up to 15 aircraft may be on the transient ramp at one time on peak days.

FBO and staff observations of transient aircraft activity indicate that corporate jet activity has been increasing recently. The airport's primary FBO reports that, in a typical day, two to five corporate jets visit the airport. This number increases during the duck hunting season (November through January) and when there are events at the Sacramento Valley Amphitheater.

Golden West Fly-In (June 2003)

These numbers do not reflect transient activity associated with the Golden West Experimental Aircraft Fly-In. Some 600 aircraft have visited the airport over the three-day period of that event. Special provisions are made to park these aircraft in the dirt area of the airport's northeast quadrant and the crosswind runway is closed.

Aircraft Operations

As is the case for almost all airports without an air traffic control tower, aircraft operations at the Yuba County Airport are not routinely counted. Estimates of current aircraft operations volumes therefore must be developed from other types of data together with any sample counts that might be available.

For the purposes of this *Master Plan* study, the Yuba County Airport is estimated to currently generate approximately 35,000 annual aircraft operations. This estimated activity level, which has remained essentially constant in recent years, is derived from various sources of information described below.

- **Sample Counts**—The California Division of Aeronautics, has established a program wherein they conduct counts of aircraft operations at many airports throughout the state. These counts are made using an acoustical counter set up at the airport, typically for three separate two-week periods representing different seasons of the year. These sample counts are then extrapolated to produce an estimated annual count. The Division conducted acoustical counts for two-week periods in September 2000, November 2001, and March/April 2002. These counts resulted in an estimated annual operations level of approximately 22,000. This estimated level of operations seems very low compared to

all other sources of operations data. California Division of Aeronautics personnel state that, while the acoustical counters may not account for all aircraft operations, they are a fairly accurate method of estimating annual operations. In the case of Yuba County Airport, the state's counts do not include operations on the crosswind runway, helicopter activity, low approaches by aircraft practicing instrument procedures, or, more significantly, some 2,000 operations estimated to take place during the Fly-In.

The last full year of operation of the control tower at Yuba County Airport was 1980. FAA records indicate that some 57,700 aircraft operations took place during that year. People familiar with the airport say that activity has declined substantially since that time.

- **FAA Terminal Area Forecast (TAF)**—The 2001 TAF shows a total of 59,740 operations in 2000. This number, also reflected in the FAA's Master Record data for the airport, is an estimate made by FAA and/or airport personnel and appears to have been simply carried forward for many years with little adjustment.

- **California Aviation System Plan (CASP)**—The 1999 CASP Forecasts assume a total of 59,818 operations in 2000.

- **Interviews With the FBO**—The airport's primary FBO has a facility that overlooks the transient aircraft apron and primary runway. It is easy to observe aircraft operations from this location. FBO personnel estimated the following aircraft activity levels:
  - 100 average daily operations during the summer;
  - 50 average daily operations during the winter;
  - 30 to 40 average daily instrument approaches;
  - 2 to 5 average daily jet operations;

FAA TAF and Master Records appear to simply be carrying forward the operations numbers that may have been accurate in the past but no longer reflect the current situation. For example, the 1982 Master Record shows 59,139 operations. The same applies to the CASP data.

Using the average daily operations levels estimated by the FBO and taking into account activity associated with the Fly-In, the current aircraft activity level is estimated to be approximately 35,000 annual operations. This conclusion is supported by the acoustical count data and personal observation of members of the consulting team.

Activity Distribution

The historical distribution of aircraft operations (i.e., day/night, local/itinerant) at Yuba County Airport can only be estimated from discussions with those familiar with the airport, such as FBO and county employees. These sources indicate that the vast majority of aircraft operations (approximately 85%) occur during the day.

Evening (7 p.m. to 10 p.m) and nighttime (10 p.m. to 7 a.m.) periods are estimated to account for only 10% and 5% of the operations, respectively. Some 25% of operations are estimated to be local (primarily touch-and-go training flights) and 75% are itinerant (to or from points beyond the immediate airport area).

Instrument Operations

Yuba County Airport provides a location for instrument training operations. Although these operations cannot be quantified because there is no Air Traffic Control Tower, FBO personnel and airport staff report that there are many instrument training operations conducted on a daily basis. These operations are not recorded by the FAA. FAA personnel report that the Northern California TRACON only counts instrument approaches at airports when the weather is below 1,500-foot ceiling and/or three miles visibility, and does not segregate practice approaches from actual instrument landings. As stated earlier, FBO personnel report 30 to 40 daily instrument approaches. Activity during actual instrument conditions represents a very small portion of airport operations (maybe 1%).

Aircraft Accident Record

National Transportation Safety Board (NTSB) records list a total of five aircraft accidents as having occurred at the Yuba County Airport from 1983 through 2001. NTSB data does not include lesser incidents (mishaps that do not result in serious injury or aircraft damage).

Four of the listed accidents occurred on the airport, two involving airplanes and two with gyrocraft. The NTSB attributed three of these accidents to pilot error and/or improper maintenance. No cause was cited for the fourth. The NTSB's final report on the latter accident stated that the aircraft hit a levee and was damaged during a forced roll-out, but did not specify the location of the levee. The final accident involved an aircraft that suffered engine failure while en route and landed in a nearby park while attempting to reach Yuba County Airport.

None of the NTSB reports suggest any airport design or safety conditions contributed to any of the accidents.

AVIATION ACTIVITY FORECASTS

In accordance with FAA guidelines, the time horizon of the forecasts in this *Airport Master Plan* is 20 years. However, many uncertainties facing the future of the general aviation industry make forecasting of airport activity an inexact science. In recognition of

these uncertainties, the 5-, 10-, and 20-year forecast intervals in this *Master Plan* are considered to be approximate time frames for reaching the stated activity levels. The focus is thus placed on increments of potential growth rather than on specific years. Planning for new facility needs can then be tied to these increments. In other words, the plans show what facilities will be needed to accommodate the specific activity levels, regardless of when those levels are reached. This is the way development usually occurs. Construction takes place as the demand becomes apparent, largely irrespective of the time frame that might initially have been anticipated.

The *Master Plan* forecasts of future aviation activity at Yuba County Airport are summarized in Table 2A together with estimates of current activity levels. Projections have been developed for based aircraft, transient aircraft parking, and annual aircraft operations. These forecasts, as outlined in the following sections, have been developed by:

- Considering the previously described historical activity levels at the Yuba County Airport;
- Assessing the national, state, and local trends and other factors that influence the airport's activity;
- Reviewing FAA and California Division of Aeronautics forecasts of activity at the airport;
- Reviewing previous local forecasts;
- Drawing conclusions from the data.

Forecast Influences

Aviation activity at any airport is influenced by a variety of factors, some locally derived and others determined by external forces. The following are among the factors that will affect based aircraft numbers, transient aircraft parking demand, and aircraft operations at Yuba County Airport.

Hangar Capacity

At least for the short term, the major factor affecting aircraft activity at the airport is the apparent shortage of aircraft hangar space. For several years, the hangar waiting list has contained approximately 30 names. Most of the names on the list are associated with aircraft that are not already at the airport, but would base there if hangars were available. Experience at other airports has found that many people will drop from hangar waiting lists if asked to place a significant deposit or when they learn what the monthly rental fees for new hangar units will be. Nevertheless, unmet demand for as many as 30 hangar spaces appears to exist.

	Current	Projected		
	2007/2008	5+ Years (2013)	10+ Years (2018)	20+ Years (2028)
Based Aircraft				
Aircraft Types				
Single-Engine	89	103	108	121
Twin-Engine	2	5	7	10
Business Jets	1	1	2	4
Helicopters	2	2	3	4
Ultralights and Gyroplanes	8	9	10	11
Total Aircraft	*102*	*120*	*130*	*150*
Transient Aircraft				
Peak Daytime Parking Demand (excluding major events)	15	18	20	25
Annual Aircraft Operations				
Aircraft Mix				
Single-Engine	30,100	36,500	39,500	46,000
Twin-Engine	2,100	2,900	3,600	5,000
Business Jets	2,000	2,700	3,300	4,600
Helicopters	400	450	600	800
Ultralights and Gyroplanes	400	450	500	600
Total Aircraft	*35,000*	*43,000*	*47,500*	*57,000*
Type of Operation				
Local (Touch-and-Goes)	9,000	11,000	12,200	14,500
Itinerant	26,000	32,000	35,300	42,500
Total	*35,000*	*43,000*	*47,500*	*57,000*
Average Operations per Based Aircraft				
Total	*343*	*358*	*365*	*380*

Table 2A

Master Plan Activity Forecasts

Yuba County Airport

Local Socio-Economic Factors

Over the longer term, the major local influences on aviation demand at Yuba County Airport involve such factors as the local economy and demographics and the community's proximity to other airports. Perhaps the most relevant is the comparatively rapid population and economic growth projected for Yuba and Sutter counties.

The Yuba County Office of Economic Development forecasts a 33% population growth in the county between 2000 and 2020. However, considering the rapid development of housing and industry in the area, the Director of Economic Development has stated that a 50% population growth over this period may be more realistic. This view is supported by the Sacramento Area Council of Governments (SACOG), which expects the two-county area population to increase by 56% from 2000 through 2020 and by 73% through 2025. SACOG also projects a 61% increase in Yuba and Sutter county employment over the 25-year period.

The surrounding industrial parks are experiencing rapid growth in tenants due in part to the low cost of land and in part to the proximity of the airport. Both the airport staff and Department of Economic Development have been actively marketing the airport and surrounding industrial parks.

The marketing efforts, land prices that are lower than the nearby Sacramento metropolitan area, tax advantages of having the airport in an enterprise zone, and recently increased interest in the industrial parks, all point to substantial future growth of aviation activity in the area.

National Trends

The major external influence on future Yuba County Airport activity is the growth of general aviation nationally. During the 1990s, the general aviation fleet was declining with accompanying declines in aircraft operations. However, with the renewed production of general aviation aircraft, general aviation activity is rebounding.

FAA Aerospace Forecasts FY 2003-2014 is a document that has been prepared "to meet the budget and planning needs of constituent units of the FAA and to provide information that can be used by State and local authorities, the aviation industry, and the general public." The report discusses three major areas: (1) the assumptions and other forecasts that were used in preparing the forecasts; (2) historical data and forecasts of future aviation demand and activity for commercial air carriers, regional/commuter airlines, and general aviation; (3) workload measures for FAA activities. The report predicts an average annual growth rate of the general aviation fleet of 1.7%, with the largest growth rate coming in jet aircraft. The report also predicts an average annual growth rate in hours flown of 1.4%, again with the largest growth rate in jet aircraft. Another source of FAA forecasts, the *2001-2005 NPIAS*, indicates that general aviation aircraft operations nationwide will grow at an average annual rate of 2.3% from 2000 through 2012.

Eclipse 500

An additional influence since the terrorist attacks of September 11, 2002, is the transition from commercial passenger service to use of business aircraft by many business travelers. The National Aeronautics and Space Administration has recently announced its proposed Small Aircraft Transportation System. The purpose of the system is to demonstrate the viability of small aircraft as an alternative to scheduled commercial airlines for trips of between 200 and 1,000 miles. The heart of the program will be small, efficient jet aircraft that can transport travelers to and from general aviation airports at a cost similar to an airline ticket. According to NASA, approximately 10 companies are in the process of developing small business jets or are contemplating doing so. As an example, Eclipse Aviation Corp. is developing a six-seat aircraft that will cost around $850,000 and fly 1,300 miles at a cruising speed of 400 miles per hour. More than 1,350 of the aircraft, which the company hopes to be available in 2004, have already been ordered.

Sutter County Airport Status

Another factor that could have a significant influence on future aviation activity at Yuba County Airport is the status of Sutter County Airport. Although there are no plans for the latter's closure, such a step is a prospect about which some local pilots and others in the community have wondered. Located only some 7 miles away by road and less than half that distance by air, Sutter County Airport serves much of the same geographic area as Yuba County Airport. Home to almost as many aircraft as Yuba County Airport (over 90 according to July 2007 FAA Master Record data), Sutter County Airport is nevertheless a much smaller facility and more constrained from future expansion.

For the purposes of this *Yuba County Airport Master Plan*, operation of Sutter County Airport is assumed to continue indefinitely. Nevertheless, the forecasts in this chapter and the airfield and building area facility requirements analyses in Chapters 3 and 4 examine the implications of a sudden influx of aircraft from Sutter County Airport if such an event should come to pass.

The Motorplex at Yuba County

There is currently a proposal to develop a large motor sports complex in Yuba County, called the Motorplex at Yuba County. The

Motorplex would be a state-of-the-art multi-use facility for all types of professional and amateur motor sports functions. As currently proposed, the facility would be located in the Yuba County Sports and Entertainment Zone, approximately a 10-minute drive southeast of the Yuba County Airport.

Inauguration of motor sports at the facility has the potential to increase usage of the airport by transient aircraft, particularly during national and international events. Without a projection of the frequency and duration of events and demographics of participants and fans, it is not possible to quantify any increase in transient aircraft parking demand or operations. However, it can be assumed that the use of the airport by twin-engine propeller aircraft and small jets would increase during events. As a comparison, national level racing events at Sears Point Raceway are reported to draw as many as 100 transient aircraft, including many business jets, to nearby Napa County Airport.

Existing Forecasts

Figure 2B graphically presents historical based aircraft data for the Yuba County Airport together with existing forecasts from the FAA, California Division of Aeronautics, and prior local studies. Figure 2C portrays similar data for aircraft operations. As noted earlier in this chapter, data for the period from the mid 1980s until recently is spotty and not considered very reliable. Data obtained and evaluated as part of this Master Plan study point to a current count of approximately 102 based aircraft and estimated total of 35,000 annual operations. Both of these numbers have remained essentially constant for several years.

FAA Forecasts

The FAA forecasts levels of aviation activity at Yuba County Airport in the NPIAS and in the TAF. The 2001-2005 NPIAS forecasts 106 based aircraft at the Yuba County Airport in 2005. This forecast implies no growth in based aircraft at the airport in the near term. Similarly, the TAF forecasts based aircraft to remain level at 106 through 2015.

The TAF also forecasts aircraft operations at the airport to remain unchanged throughout the forecast period. The actual TAF numbers are misleading, however, in that they assume a current 59,740 annual operations, some 70% above the estimated current activity. Contrary to these no-growth forecasts, the NPIAS predicts annual growth of 2.3% in national general aviation operations and 1.4% in hours flown through 2014.

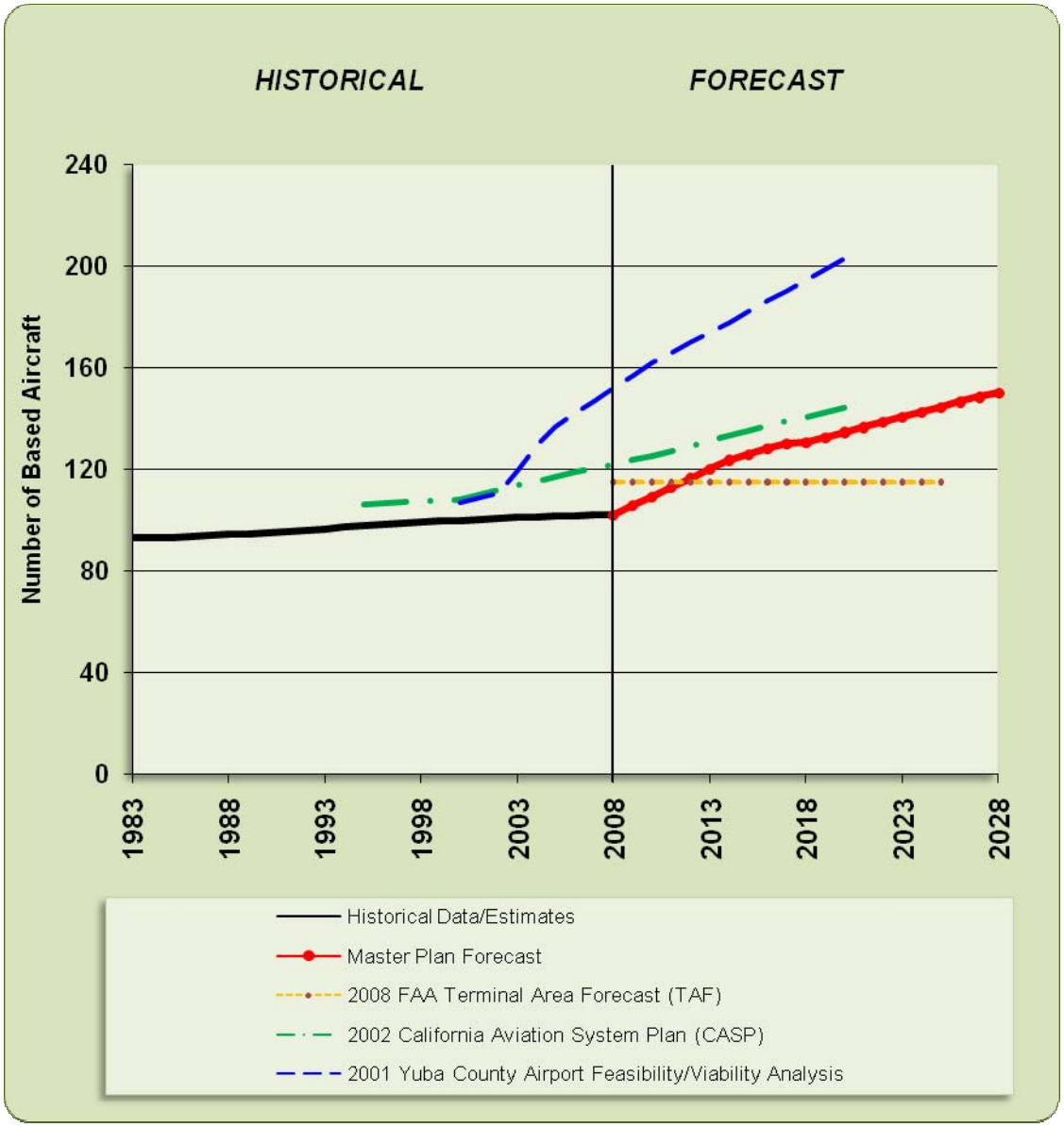


Figure 2B

Based Aircraft

Yuba County Airport

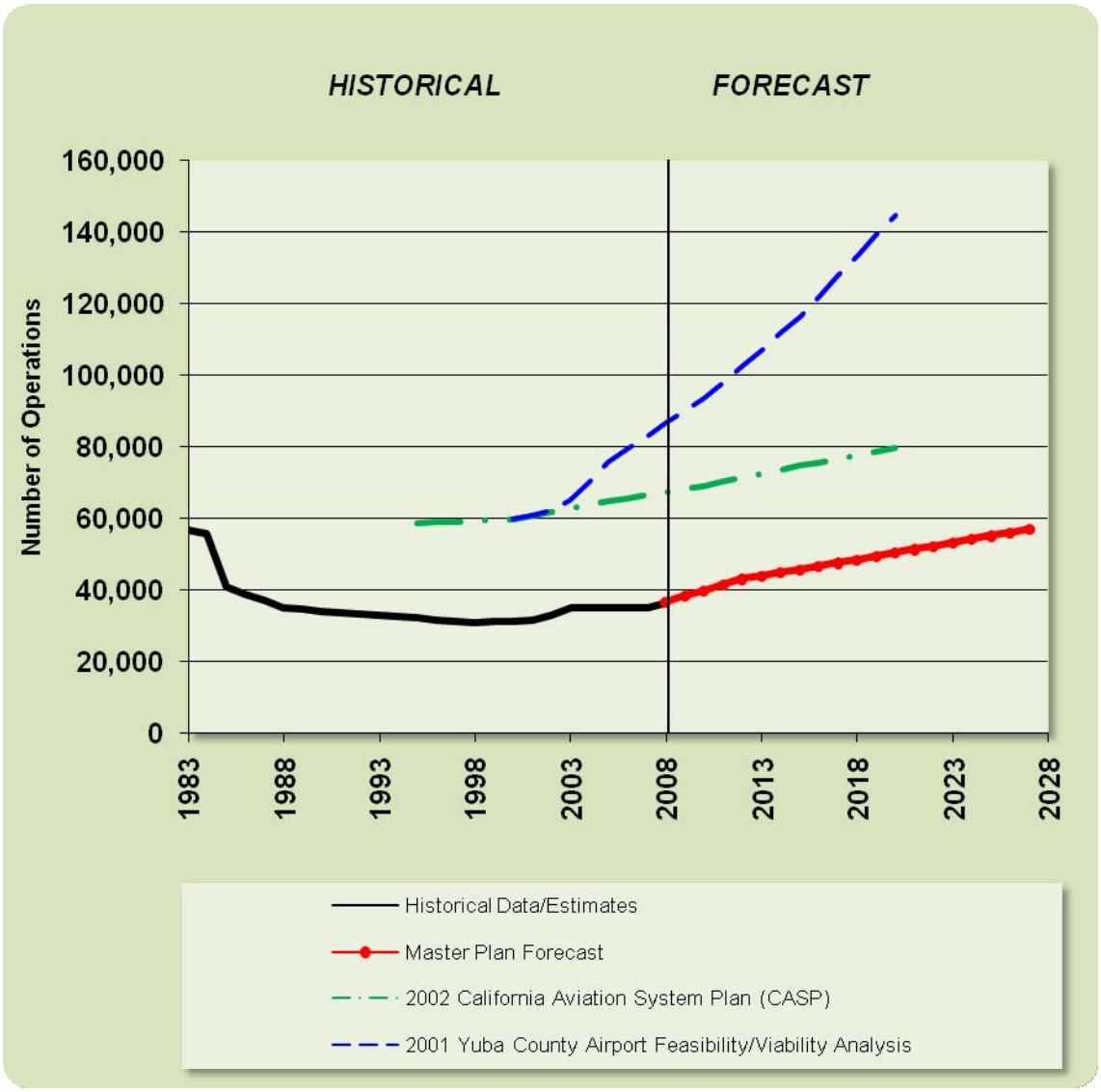


Figure 2C

Aircraft Operations

Yuba County Airport

State Forecasts

The California Division of Aeronautics provides forecasts of based aircraft and aircraft operations as part of the California Aviation System Plan (CASP). The current (1999) CASP predicts that based aircraft at the Yuba County Airport will grow from 108 in 2000 to 144 in 2020, an annual increase of about 1.4%. The CASP predicts operations increasing from 59,818 in 2000 (higher than apparently occurred) to 79,757 in 2020, or an approximate 1.5% annual growth rate. This growth rate is similar to the abovementioned FAA projection of a 1.4% annual increase in hours flown nationally.

Local Forecasts

The previous master plan for Yuba County Airport, prepared in 1986, anticipated substantial increases in airport activity. From a base level of 96 in 1985, the based aircraft count was projected to reach 216 in 2005. Likewise, aircraft operations were expected to grow from 65,000 in 1985 to 127,400 in 2005. These forecasts far exceed the growth actually experienced at the airport.

In 2001, Yuba County completed a study to evaluate the feasibility and viability of proposed and recommended development at the airport. The study, entitled *Yuba County Airport, Feasibility/Viability Analysis (Phase 2)*, was conducted by the Aviation Management Consulting Group. The study developed forecasts of based aircraft, aircraft operations, and general aviation fuel flowage. The study forecast a growth in total based aircraft from 107 in 2000, to 203 in 2020. This is approximately the same rate of growth as projected in the 1986 *Master Plan* but starting at a later date. The study forecasted a growth in aircraft operations from 59,740 to 144,638 in 2020. An important assumption in this analysis was that the Motorplex at Yuba County would be completed. This development, described in more detail above, has not occurred. Consequently, these forecasts appear to be high.

Forecast Scenarios

Based Aircraft

Four based aircraft forecasts can be envisioned for Yuba County Airport.

- **Constrained**—The number of based aircraft at the airport has been fairly constant from the mid-1980's until about 2000. One prospect is that this trend will continue. A lack of hangar space, upgraded FBO facilities, and corporate aircraft parking space

could cause prospective tenants to base at other airports in the region.

- **National and Regional Trends**—As stated earlier, the FAA projects an annual average growth in the general aviation fleet of about 1.7% through 2012. This is reflective of the growing number of newly manufactured general aviation aircraft. It is possible, given the economic development and population growth projected for the region, that this growth could lead to increased based aircraft at the airport. If Yuba County Airport were to match the national growth rate of the general aviation fleet and continue this trend through 2023, some 141 aircraft would be based there in that year.

- **Expanded Activity Projection**—A good argument can be made that the rapid growth in population and employment in the area served by Yuba County Airport will result in a growth rate of based aircraft that will be higher than the national general aviation fleet growth. SACOG projects population within Yuba and Sutter counties to increase at a combined average annual rate of 2.2% between 2000 and 2025. Employment growth is projected at 1.9% per year on average over this same period. If based aircraft at Yuba County Airport were to increase at a similar rate, say 2.0%, then the airport would have 150 based aircraft in 2023.

- **Sutter County Airport Closure**—If Sutter County Airport remains open and continues to add aircraft at a rate similar to the 1.7% increase projected for the nationwide fleet, it would reach some 130-based aircraft in 2028. Closure of the airport and relocation of all of the aircraft to Yuba County Airport would increase the latter's based aircraft count by the same amount. Such a scenario is regarded as unlikely, however, in that some aircraft could be expected to move to other airports in the region or simply to be sold. For planning purposes, an increase of 100 aircraft at Yuba County Airport under this scenario is the maximum that can be considered plausible.

Transient Aircraft

Demand for transient aircraft parking at Yuba County Airport is anticipated to continue growing along with the development of the surrounding industrial parks. A growth rate of approximately 1.7%, equivalent to the forecast growth in based aircraft, is considered reasonable for planning purposes. Applying this to an average weekly peak of 15 transient aircraft results in a forecast peak of 20 transient aircraft at the planning period. Alternatively, a 2.0% annual growth rate—matching that of the expanded based aircraft

forecast—produces 22 transient spaces as the projected demand for 2028 and a 2.5% growth rate means a need for 25 spaces.

Most of the transient aircraft parking demand is expected to continue to be generated by single-engine airplanes. Corresponding to the growth in the national general aviation aircraft fleet, usage of the airport by transient twin-engine airplanes, helicopters, and small business jets is expected to increase more than single-engine airplanes. A substantial number of these corporate-type aircraft potentially would use the airport during special events at the nearby Amphitheater and possible future Motorplex. Provisions will need to be made for parking these aircraft, if not on the regular transient ramp, then in a paved overflow area.

The other local event that draws large numbers of aircraft is the Fly-In. Hundreds of aircraft arrive for this annual air show. Construction of permanent facilities for the Fly-In is not regarded as practical or necessary. Aircraft can continue to park in designated unpaved areas.

Aircraft Operations

The same four forecast scenarios outlined above with respect to based aircraft apply to aircraft operations.

- **Constrained**—Various factors could contribute to minimal growth in aircraft operations. These include a long-term slow economy, lack of growth in the surrounding business parks, population growth slower than currently projected, and failure to add new hangars and other facilities and services at the airport. Under this scenario, aircraft operations would remain at about the current 35,000 level.

- **National and Regional Trends**—As stated earlier, the FAA projects an annual growth in general aviation operations of 2.3% through 2012. Applying this growth rate to Yuba County Airport and extending it through 2028 results in approximately 55,000 aircraft operations by the end of the 20-year *Master Plan* time frame.

- **Expanded Activity Projection**—Given the growing population and economy of the region, it is not unreasonable to anticipate aircraft operations at Yuba County Airport to exceed the national average. Expanded FBO services at the airport and/or construction of the nearby Motorplex both could contribute to an expanded activity projection. An average annual growth rate of 2.7%—comparable to the expanded based aircraft projection relative to the national trends—would bring aircraft operations to 60,000 in 2028.

- **Sutter County Airport Closure**—According to FAA data for 2002, some 20,000 aircraft operations presently take place annually at Sutter County Airport. While this estimate seems overstated, it is probably reasonable as a 20-year projection. If the airport were to close and most of the aircraft relocate to Yuba County Airport, the latter could easily have an additional 30,000 annual operations over and above the levels in the above scenarios.

Conclusions

The high growth rates of aviation activity forecasted for Yuba County Airport in the 1985 *Master Plan* and the more recent *Yuba County Airport Feasibility/Viability Analysis (Phase 2)* both rely upon certain assumptions that, to date, have not occurred. On the other hand, the no-growth scenario represented by FAA forecasts reflects the actual experience over the last 20 years, but is unsuitable for long-range planning purposes. It also overlooks the apparent unmet current demand resulting from the shortage of aircraft hangar capacity.

More of a middle ground can be found in the CASP forecasts and in the scenarios keyed to nationwide general aviation growth and regional socio-economic projections. All of these forecasts would result in somewhere between 141 and 150 based aircraft at Yuba County Airport in 2028. Since the purpose of this *Master Plan* is to guide the long-term development of the airport to meet the aviation needs of the community, a forecast in this range is considered the most reasonable. Specifically, a planning forecast of 150 based aircraft by about 2028 is utilized herein. The Sutter County Airport closure scenario is too uncertain at this time to serve as the basis for detailed facility planning at Yuba County Airport. The prospect that the airport could gain another 100 aircraft is taken into account only in a general manner.

Activity forecasts for Yuba County Airport are summarized in Table 2A. The *Master Plan* projects based aircraft to increase from 102 in 2003 to 150 by about 2028, an average annual increase of 2.0%. If additional hangars are built in the near term, a substantial portion of this increase could occur within this time frame. The projected demand for transient aircraft parking is in the range of 20 to 25 positions in 2028. This number is exclusive of overflow needs during special nearby events and the Fly-In.

Single-engine airplanes, together with a few ultralights and gyroplanes, will continue to comprise the bulk of the airport's based aircraft fleet. However, consistent with national trends, corporate aircraft—twin-engine piston and turboprop airplanes, business jets, and helicopters—will be much more strongly represented at the airport in the future than they are today. The latter aircraft are projected to account for some 12% of based aircraft in roughly 20 years compared to only 4% in the 2003-2008 timeframe.

Utilizing similar rationale with respect to aircraft operations, an average annual increase of about 2.5% is projected for the purposes of the *Master Plan*. The resulting forecast is for some 57,000 aircraft operations in approximately 2028. A significant portion of this growth is attributable to the growth of based aircraft at the

Projections of future levels of aircraft operations are not a major factor in the planning and design of improvements at Yuba County Airport. As noted in Chapter 3, any foreseeable aircraft operations level is well below the operational capacity of the runway system. Brief operational delays may occasionally occur during peak periods, but these delays would not warrant major runway improvements in the near term. Operational forecasts are also used in the assessment of the potential noise impacts of airport activity. The cumulative noise impact, as defined by Community Noise Exposure Level (CNEL) contours, is not expected to be a major concern at Yuba County Airport even if total operations exceed those projected in this *Master Plan.* Current and projected noise impact contours are depicted in Chapter 5.

airport and increased transient use, especially on business purposes. Some increase in aircraft utilization (operations per based aircraft) is assumed as well. Consistent with both the based aircraft projections and national trends, twin-engine airplane, business jet, and helicopter activity is expected to increase more rapidly than single-engine airplane operations. Because of the historic high percentage of transient aircraft operations, the percentage of transient and local operations is expected to remain fairly constant.

3

Airfield Design

3

Airfield Design

OVERVIEW

Major components of an airport's airfield include its runways, taxiways, and navigational aids, and the various protected areas around these features

The basic configuration of the runway and taxiway system at Yuba County Airport has remained largely unchanged since the airport was constructed during World War II. The only significant changes have been enhancement of the instrument approach capabilities and reduction in the defined length and width of the crosswind runway. Essentially no new airfield pavement has been added.

This chapter contains a comprehensive assessment of future airfield development needs. For the most part, the recommendations resulting from this assessment are similar to those of past Master Plans for the airport. Notable among the issues examined herein are the following:

- Southward extension of Runway 14-32
- Preservation of the crosswind runway
- Addition of a parallel runway
- Extension of Taxiway A
- Relocation of Taxiway B
- Elimination of Taxiway C.

Figure 3A portrays the areas on the airport affected by these issues. Available choices and factors to be considered in response to these issues are summarized in Table 3A.

Issues	Questions	Choices	Factors to Consider
Southward Extension of Runway 14-32	› Is extension needed? › What length would be necessary? › What would impacts be?	› Maintain current runway length › Extend runway up to 1,000 feet › Extend runway more than 1,000 feet	› Few aircraft now operating at airport are constrained by existing 6,000-foot runway length › Previous airport plans contemplated extending runway length to as much as 9,000 feet to serve large air cargo aircraft; air cargo service now appears unlikely › To provide essential runway safety area length, an extension of more than 1,000 feet necessitates relocation of Skyway Drive; extension of more than 2,000 feet requires relocation of Arboga Road › Few general aviation aircraft likely to use airport would be constrained by 7,000-foot runway length › Any extension would bring south end of runway closer to Buttercup subdivision › Acquisition of additional property for approach protection at south end of runway is desirable even with present runway length
Preservation of Crosswind Runway	› Is runway needed? › Are there better uses for the land?	› Keep runway in use › Close runway	› Runway useful for light aircraft on occasions when strong crosswinds occur; also used for crosswind landing practice › Runway enables airport to remain open when primary runway closed for maintenance › Wind data suggests crosswind runway is needed less than 1% of the time › Closure would allow northeast quadrant to be contiguous to existing core area › Northeast area land might remain vacant—no apparent immediate need for the land and other areas have higher priority for development › Some cost associated with pavement maintenance if runway remains in use
Addition of Parallel Runway	› Will additional runway capacity be needed? › If so, when? › What length is needed? › Are there better uses for the land? › What would impacts be?	› Include runway in plan › Preserve option for runway, but not show on plan › Exclude runway from plan	› 3,750-foot runway was included in previous airport plans and was accounted for in adjacent property line location › Parallel runway would allow separation of small aircraft and flight training from larger aircraft on primary runway › Additional runway not needed for capacity purposes in foreseeable future › Property not easily usable for alternative purposes › Environmental analyses required if runway kept in new master plan
Extension and Realignment of Taxiway A	› What factors drive need for extension? › Should current runway-to-taxiway separation be maintained?	› Extend only when runway extension constructed › Extend to provide access to additional building area › Keep existing separation › Move taxiway closer to Runway 14-32	› Extension clearly needed; mostly question of impetus › Future alignment could be closer to runway—400 feet rather than present 512 feet › Realignment of only extended portion of taxiway would result in jog near present runway end › Additional building area land that gained by realignment would be inside BRL and thus limited to apron construction
Relocation of Taxiway B	› Could relocation provide useful added land for core area uses?	› Keep taxiway in present location › Move taxiway closer to Runway 5-23	› Taxiway is much farther from Runway 5-23 than applicable FAA standards require › Area available for hangar sites could be expanded › Potentially awkward taxiway access to existing hangars if new development placed in front of them › Area used during air show › Area needed for drainage purposes
Elimination of Taxiway C	› Is taxiway needed?	› Keep taxiway › Close runway	› Closure would enable interior of northeast quadrant to be developed › Difficult to get road access to area even with taxiway closed

Table 3A

Airfield Development Issues Summary

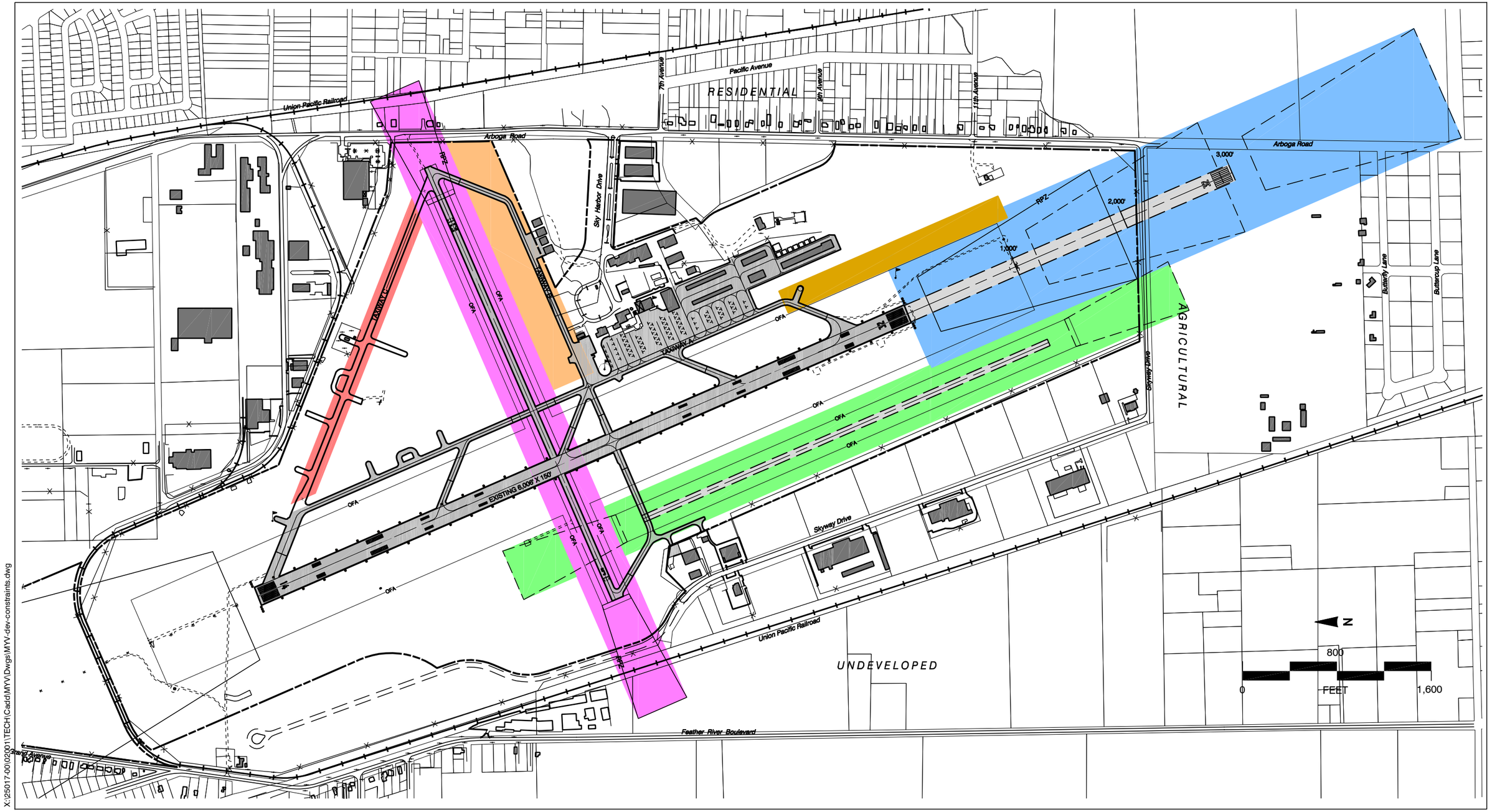


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Figure 3A

Airfield Development Issue Sites

Yuba County Airport

BASIC DESIGN FACTORS

The overall design of an airport's airfield is shaped by a small set of key factors. This section looks first at the external influences on airfield design—the demand determinants—and then at the fundamental needs that result from these demands.

Demand Determinants

In simple terms, the demand placed on an airport's airfield facilities can be defined in terms of three key parameters:

- The total volume of aircraft operations;
- The types of aircraft seeking to operate at the airport; and
- The weather conditions that affect those operations.

For Yuba County Airport, the specific demand determinants are as outlined below.

Aircraft Activity Volume

The *Master Plan* activity forecasts (see Chapter 2) anticipate that total annual aircraft operations at Yuba County Airport will reach approximately 57,000 annually in 20 years, compared to approximately 35,000 annual operations at present. Closure of Sutter County Airport could add 30,000 annual operations to this total.

Design Aircraft

Currently, the majority of operations at the Yuba County Airport are generated by single-engine piston aircraft. The airport also sees frequent use by larger, faster aircraft such as twin-engine piston, twin-engine turboprop, and small- and medium-size business jets. The most demanding class of aircraft regularly using the airport (defined by the FAA as more than 500 annual operations) are smaller business jets, such as the Cessna Citation II and III. The most demanding aircraft that less often use the airport (excluding during the fly-in) are larger business jets such as the Challenger 600 series (up to 47,600 pounds maximum takeoff weight, 64.3-foot wingspan) and Gulfstream IV (75,000 pounds maximum takeoff weight, 77.8-foot wingspan).

Cessna Citation II

Challenger 600

The forecasts described in Chapter 2 indicate that the smaller aircraft will continue to dominate the airport's usage, but that business jet aircraft activity will have the most rapid growth. By 2028, some 4,600 (8.1%) of the airport's projected 57,000 aircraft operations are expected to be generated by business jets, up from 2,000 (5.7%) of the present 35,000 operations.

Boeing Business Jet (BBJ)

Among these jets, the aircraft potentially could see occasional visits by aircraft larger than the Gulfstream IV: for example, the Gulfstream V (90,900 pounds maximum takeoff weight, 93.5-foot wingspan) or even the Boeing Business Jet (171,000 pounds maximum takeoff weight, 112.6-foot wingspan). This usage is expected to remain less than the 500 annual operations regarded by the FAA as criterion for determining an airport's design aircraft. For planning purposes, the Gulfstream IV and similar aircraft are considered by this *Master Plan* to be the airport's design aircraft.

Weather Conditions

The two facets of local weather conditions that most directly affect the design of an airport's airfield are wind and visibility. Wind conditions—specifically speed and direction—determine the optimum alignment of the runway or runways. Visibility conditions, both horizontally and the height of cloud ceilings, are key factors with respect to whether instrument approach capabilities are needed.

Weather data for Yuba County Airport is recorded by means of an Automated Surface Observing System (ASOS) located on the airport. A review of the data for a 10-year period (1992 through 2001) reveals that prevailing winds are mostly from the southeast or south-southeast and secondarily from the northwest or north-northwest. Winds that are essentially calm (10 knots or less) occur 78.3% of the time. Visibility drops below the minimums for visual flight (basically, 1-mile horizontally with a 1,000-foot cloud ceiling) during 4% of the hours in the year.

Needs Assessment

For the purpose of airfield design, the operational demands described above must be translated into facility needs. In basic terms, these needs can be assessed with respect to four design factors:

- The runway length needed to serve the critical aircraft;
- The classification of the runways and taxiways for design purposes;
- The adequacy of the runway/taxiway system capacity; and
- The adequacy of the runway system wind coverage.

Runway Length

The length of the runway required to accommodate the most demanding airplanes anticipated to use the airport is a fundamental airfield design factor. Runway length requirements for specific

aircraft are dependent upon airfield elevation and design temperature (the average high temperature for the hottest month). For several categories of small aircraft, the FAA has established formulas indicating the desirable runway length. For large aircraft, this data is available in performance charts provided by aircraft manufacturers.

Specific length requirements for each of Yuba County Airport's runways are analyzed in subsequent sections of this chapter.

Airport Classification / Design Standards

Another basic airfield design requirement which must be assessed is the capability of the facilities to safely accommodate the types of aircraft that seek to operate at the airport. Runway length is a key component of this assessment, but other facility dimensions, such as pavement widths and lateral clearances, are also very important.

FAA design standards for these features are set in accordance with the Airport Reference Code (ARC) applicable to the airport as a whole or, in many cases, to individual runways or taxiways (Advisory Circular AC 150/5300-13, *Airport Design*). The primary determinants of ARC classifications are the approach speed and wingspan of the most demanding types of aircraft expected to operate at the airport, together with the type of approach capability the runway has or will have.

Table 3B summarizes the FAA design standards associated with several ARC classifications relevant to Yuba County Airport. Later sections of this chapter examine the significance of these standards with respect to individual components of the airfield design.

Airport Reference Code Criteria

Approach Category	*Approach Speed Range*	
A		<91 kts
B	≥91 kts	<121 kts
C	≥121 kts	<141 kts
D	≥141 kts	<166 kts
E	≥166 kts	
Design Group	*Wingspan Range*	
I		<49 feet
II	≥49 feet	<79 feet
III	≥79 feet	<118 feet
IV	≥118 feet	<171 feet
V	≥171 feet	<214 feet
VI	≥214 feet	<262 feet

Operational Capacity

An airport's operational capacity is generally measured in terms of the number of aircraft operations the runway and taxiway system can accommodate in an hour or over a year. Calculation of airfield capacity, particularly annual capacity, is dependent upon various physical and operational factors. At very busy airports, airfield capacity can be the major determinant of future runway/taxiway system improvement requirements.

Based on FAA methods for estimating capacity and delay for long range planning (Advisory Circular 150/5060-5, *Airport Capacity and Delay*), Yuba County Airport's operational capacities are:

- Hourly VFR capacity: 98 operations;
- Hourly IFR capacity: 59 operations;
- Annual Service Volume: 230,000 operations.

Item	FAA Airport Design Standards [1]			Existing Dimensions	
				Runway 5-23	Runway 14-32
Airport Reference Code	B-I (small)	B-II	C-III		
Aircraft Approach Speed	<121 kts	<121 kts	<141 kts.	<121 kts	<141 kts
Aircraft Wingspan	<49 ft.	<79 ft.	<118 ft.	<49 ft.	<118 ft.
Aircraft Weight Group (lbs)	≤12,500	>12,500	>12,500	>12,500	>12,500
Approach Visibility Minimums	Visual or ≥¾ mile	Visual or ≥¾ mile	<¾ mile	Visual	½ mile
Runway Design					
Width	60 ft.	75 ft.	100 ft.	60 ft.	150 ft.
Safety Area (RSA)					
Width	120 ft.	150 ft.	500 ft.	120 ft.	500 ft.
Length beyond Runway End	240 ft.	300 ft.	1,000 ft.	Rwy 5: >240 ft. Rwy 23: 240 ft.	Rwy 14: >1,000 ft. Rwy 32: >1,000 ft.
Obstacle Free Zone (OFZ)[2]					
Width (W)	250 ft.	400 ft.	400 ft.	250 ft.	400 ft.
Object Free Area (OFA)					
Width	250 ft.	500 ft.	800 ft.	250 ft.	800 ft.
Length beyond Runway End	240 ft.	300 ft.	1,000 ft.	Rwy 5: >240 ft. Rwy 23: 240 ft.	Rwy 14: >1,000 ft. Rwy 32: >1,000 ft.
Gradient (maximum)	2.0%	2.0%	1.5%	0.06%	0.05%
Runway Setbacks					
From Runway Centerline to:					
Hold Line	125 ft.	200 ft.	250 ft.	200 ft.	250 ft.
Parallel Taxiway	150 ft.	240 ft.	400 ft.	512 ft.	512 ft.
Aircraft Parking Line (APL)	125 ft.	250 ft.	500 ft.	>125 ft.	>500 ft.
Building Restriction Line (BRL)[3]	370 ft.	495 ft.	745 ft.	>370 ft.	>750 ft.
Taxiway Design					
Width	25 ft.	35 ft.	50 ft.	50 ft.[4]	50 ft.[5]
Safety Area Width	49 ft.	79 ft.	118 ft.	49 ft.	118 ft.
Taxiway and Taxilane Setbacks					
From Taxiway Centerline to:					
Fixed or Movable Object	45 ft.	66 ft.	93 ft.	> 45 ft.	68 ft.
From Taxilane Centerline to:					
Fixed or Movable Object	40 ft.	58 ft.	81 ft.	N/A	40 ft.

[1] Source: FAA Advisory Circular 150/5300-13, Change 7, *Airport Design* (October 2002).

[2] OFZ extends 200 feet beyond end of runway.

[3] The FAA no longer has fixed distance standards for the BRL 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.

[4] Taxiway D width is 25 feet.

[5] Taxiway A width to Runway 14 Approach is 100 feet.

Table 3B

Airfield Design Standards

Yuba County Airport

The latter number is theoretical and assumes a relatively high usage of the airport during off-peak hours. Even if demand is more concentrated during peak hours, however, the airport's runway capacity is well above the projected annual demand. The hourly capacity also exceeds normal demand. Aircraft may occasionally experience delays in landing or taking off, but these delays will be of short duration. The major exception is during the annual fly-in. The control tower is temporarily activated during this event to help ease the flow of traffic.

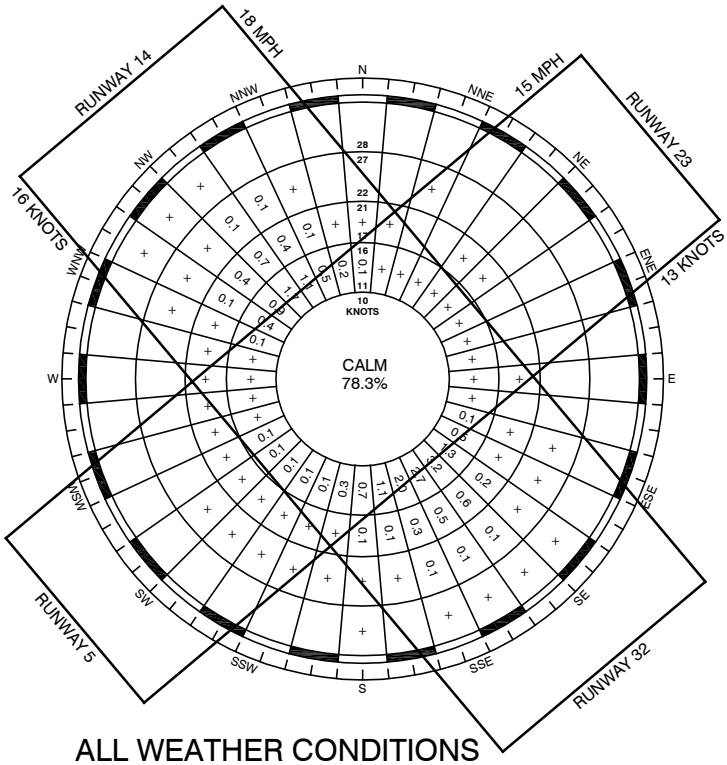
No significant added capacity is provided by Runway 5-23. Because it intersects with Runway 14-32, the two runways cannot be used simultaneously. To increase the airfield capacity, a parallel runway would be required. Although the activity forecasts indicate that an additional runway will not be necessary within the 20-year time frame of this *Master Plan*, some concepts and issues regarding an eventual third runway are outlined later in this chapter.

Wind Coverage

Strong winds at an airport can represent additional airfield design concerns. FAA guidelines establish that the orientation of an airport's runways should enable the airport to be usable, with crosswinds at an acceptable velocity, during at least 95% of the year. Airports with lower annual wind coverage qualify for FAA funding for a crosswind runway. The criteria for an acceptable crosswind velocity are tied to the runway's Airport Reference Code and thus to the type of aircraft using the runway. Small, light aircraft are more affected by strong crosswinds than are larger, heavier planes. For small planes, the FAA considers a 10.5 knot crosswind to be the maximum acceptable, whereas heavy jets can tolerate as much as 20 knots.

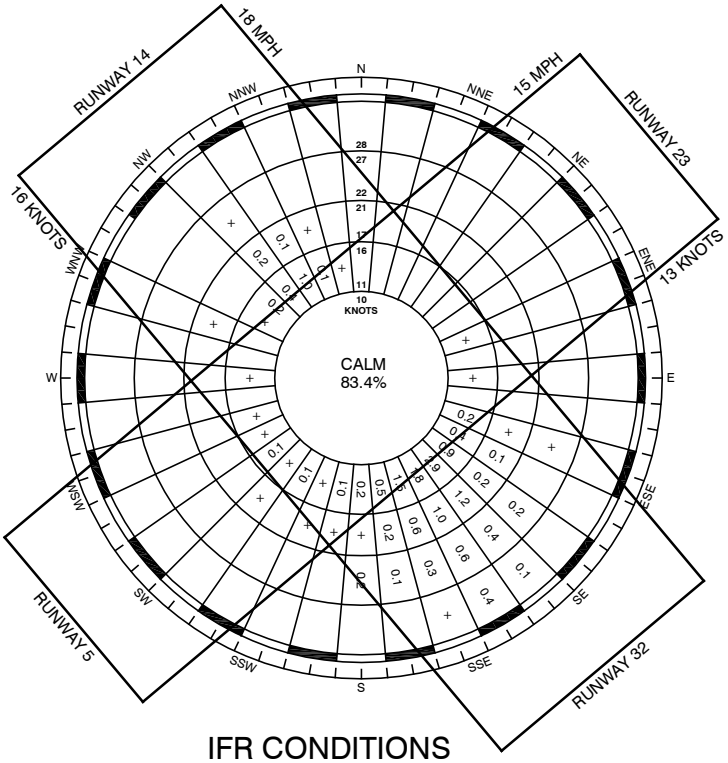
Analysis of the previously cited Yuba County Airport wind data indicates that, even with maximum crosswinds of only 10.5 knots, the airport's primary runway (14-32) has nearly a 99% wind coverage under both VFR and IFR conditions (see Figure 3B). This data indicates that a crosswind runway is not essential.

As summarized in Table 3A, there are tradeoffs to keeping Runway 5-23 active. Advantages include that: the runway is important to pilots of light aircraft during occasional strong crosswind conditions; it is sometimes used by pilots to practice crosswind landings when winds are from the prevailing north or south direction; and, thirdly, its existence enables the airport to remain operational when the primary runway is closed for repairs. Except for some minor maintenance costs, the chief disadvantage to preserving Runway 5-23 is that the land could potentially be more valuable for expansion of the airport building area. This concept is explored in Chapter 4.



ALL WEATHER CONDITIONS

ALL WEATHER WIND COVERAGE			
Runway	12 M.P.H. (10.5 Knots)	15 M.P.H. (13 Knots)	18 M.P.H. (16 Knots)
5-23	80.45%	86.99%	-
14-32	98.89%	99.53%	99.88%
Combined	99.65%	99.92%	-



IFR CONDITIONS

IFR WIND COVERAGE		
Runway	15 M.P.H. (13 Knots)	18 M.P.H. (16 Knots)
5-23	88.20%	-
14-32	99.41%	99.81%
Combined	99.73%	-

Source: National Climatic Data Center (NCDC) Period: Surface Wind Velocity, January 1992 to December 2001

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Figure 3B

Wind Rose

Yuba County Airport

The conclusion reached is that no alternative need for the land is foreseeable within the 20-year planning horizon. Continued operation of Runway 5-23 is therefore recommended.

RUNWAYS

Classification

Two factors play a part in determining the appropriate Airport Reference Code for an airport's runways. Ideally, the runway classification should be based solely upon the critical aircraft for which a demand for use of the runway can be identified. Often, though, a runway's existing dimensions and the extent to which it can reasonably be upgraded are significant considerations.

As discussed earlier in this chapter, aircraft such as the Citation II and III represent the critical aircraft currently using Yuba County Airport. In the future, larger business jets like the Challenger 600 series or the Gulfstream IV are expected to operate often enough to be considered the critical aircraft for design purposes. The approach speed and wingspan of the Citations fall within the criteria for ARC B-II—i.e., approach speed less than 121 knots and wingspan less than 79 feet. The Challenger 600 series and the Gulfstream IV are ARC C-II (approach speed less than 141 knots) and ARC D-II (approach speed less than 166 knots) category aircraft, respectively.

- **Runway 14-32**—Given this projected usage, the desirable classification for the airport's primary runway—Runway 14-32—and its associated taxiways is ARC D-II. (Note that the airfield dimensional requirements for approach categories C and D are the same.) As summarized in Table 3B and documented in the more detailed analyses that follow, a comparison of the existing Runway 14-32 dimensions against ARC D-II standards reveals that the facilities meet or exceed all of the requirements. Indeed, the runway meets design standards for ARC D-III—i.e., for aircraft with wingspans less than 118 feet. Although few aircraft fall within this classification, various aircraft that might use the airport are classified as ARC C-III—the Boeing Business Jet, for example. On this basis, it is recommended that Runway 14-32 and its associated taxiways continue to be designed to meet ARC C-III standards.

Actual airfield dimensions at Yuba County Airport do not directly correlate to any particular set of Airport Reference Code standards. The ARC classification system did not come into existence until many years after the major airfield features were constructed during World War II.

- **Runway 5-23**—Because of the capabilities provided by Runway 14-32, the demands on the crosswind runway are limited to usage by small airplanes (12,500 pounds or less) in ARC B-I. The runway's critical areas and setback distances generally exceed the design standards associated with the ARC B-I (small) classification, but other dimensions—especially the relatively recent reduction in its width to 60 feet—are consistent with this classification. ARC B-I (small) is therefore the recommended classification for Runway 5-23.

As a side note, it is important to recognize that designing airfield facilities to comply with the standards for a particular Airport Reference Code does not restrict the airport to usage only by corresponding-sized aircraft. As noted earlier, the FAA sets 500 operations per year as the usage criterion for determining the critical aircraft. Larger aircraft can use an airport provided that, at the determination of the pilot, they can do so safely. Moreover, the airport need not be designed with respect to the standards for these larger aircraft provided that they will operate less often than the threshold level. In addition to wingtip clearances and other dimensional considerations, pavement strength is often a major determinant of how large of an aircraft an airport can safely accommodate even on a rare basis.

Length

The longest of Yuba County Airport's two runways—Runway 14-32—is 6,006 feet long. This length is ample for all aircraft currently based at the airport and sufficient for all transient aircraft that use the airport on a regular basis. However, in the coming years, larger business jet aircraft are forecasted to seek to operate at the airport with increasing frequency. Many of these aircraft are operationally limited by the present runway length, particularly on hot days. To take off under these conditions, they need to reduce the amount of fuel on board (and thus the distance they can fly) and/or the amount of payload carried (including passengers, baggage, and cargo).

Demands on the secondary runway—3,281-foot long Runway 5-23—are by comparison much less. Consistent with its minimal usage and ARC B-I (small) classification, its length need only be sufficient to accommodate single-engine and small-to-medium twin-engine airplanes.

Requirements

Two tools are available to help assess Yuba County Airport's future runway length requirements. One is an FAA computer program (derived from data in Advisory Circular 150/5325-4A,

Runway Length Requirements) which calculates the runway length needed to accommodate certain percentages of the nation's small and large airplane fleets. The second useful tool is the performance data supplied by the manufacturers of individual aircraft models.

- **Runway 14-32**—Given Yuba County Airport's elevation (62 feet) and average maximum, hottest-month temperature (96°F), the FAA's computer program indicates the runway length requirements for airplanes weighing between 12,500 and 60,000 pounds to be as shown in the adjacent box. Most of these aircraft are business jets.

  This data indicates that the current 6,006-foot length of Runway 14-32 is adequate for all aircraft of this weight class when limited to 60% of their useful load. To enable higher useful loads to be carried—the primary benefit of which would be an increase in nonstop flight distances—an increased runway length is necessary.

  A look at the specific runway length requirements for a sampling of contemporary business jet aircraft yields a similar conclusion. Note that the following calculations were based on the aircraft operating at maximum gross takeoff weight (100% useful load).

- **Runway 5-23**—Originally constructed to a length of 4,000 feet, both ends of Runway 5-23 were shortened around 1980 to eliminate the displaced landing thresholds and bring the runway protection zones more onto airport property. The current length is 3,281 feet with the remaining pavement serving as lead-in taxiways. As the data in the adjacent table shows, the existing length is more than adequate for the runway's usage which is minimal and limited only to small airplanes—ones weighing 12,500 pounds or less. This evaluation is especially true considering that, as a crosswind runway, FAA guidelines allow a 20% reduction in the full length requirements. No changes in the current length of Runway 5-23 are proposed.

Runway Length Requirements for Large Airplanes Weighing 60,000 lbs. or Less

		% of Fleet	
		75%	*100%*
% *Useful Load*	*60%*	5,440 ft.	5,730 ft.
	90%	7,240 ft.	9,260 ft.

Runway Length Requirement for Specific Business Jets

Aircraft	*Maximum Gross Takeoff Weight (Pounds)*	*Required Runway Length (feet)*
Hawker Horizon	36,000	6,300
CRJ-100	51,000	6,700
Citation 10	35,700	6,800
Global Express	95,250	6,900
Gulfstream V	90,900	7,300
Boeing Business Jet	171,000	8,000

Runway Length Requirements for Airplanes Weighing 12,500 lbs. or Less

# of Pass. Seats	*% of Fleet*		
	75%	*95%*	*100%*
<10	2,580 ft. 2,060 ft.	3,160 ft. 2,530 ft.	3,740 ft. 3,000 ft.
≥10	—	—	4,380 ft. 3,500 ft.

Smaller numbers represent crosswind runway length requirements (80% of full requirement)

Runway 14-32 Extension Alternatives

Given the conclusion that a variety of aircraft in Yuba County Airport's present and/or future fleet mix could benefit from a longer runway, the questions to be answered are:

- In what direction should the extension be built?
- How long should the extension be?
- When should the construction be planned?

Because of existing urbanization to the north, only a southward extension is considered feasible. Previous plans for the airport proposed extending Runway 14-32 by anywhere from 1,300 feet to as much as 3,000 feet. The latter length was in anticipation of cargo airline service using larger aircraft than are currently envisioned to be part of the airport's fleet. As can be seen in Figure 3A, an extension of this length also can be ruled out because runway safety area requirements would necessitate relocation of Arboga Road. The maximum extension that can be achieved without affecting Arboga Road is approximately 1,700 feet. Even an extension of this length would require relocation of Skyway Drive. In order to leave Skyway Drive unaffected, the maximum extension attainable is 1,000 feet. An extension of this amount corresponds well with the above analyses which suggest a length of between approximately 6,700 and 7,300 feet as being desirable. Accordingly, planning for extension of Runway 14-32 to a length of 7,000 feet is recommended.

The question of timing is more difficult to answer precisely. As noted earlier, the current runway length is adequate for nearly all of the current users of the airport. Operations by aircraft types that could benefit from a longer runway will need to become much more frequent before construction of an extension can be justified. How soon this will occur depends in part upon construction of building area facilities and improvement of fixed base operations services to attract and accommodate these users. The timing should be reassessed every few years, but at present the soonest that a runway extension appears likely to be warranted is in the five-to-ten-year time frame. In the meantime, the county's efforts should be focused on land acquisition to better protect the southern approach to the existing runway and help preserve the opportunity for a future runway extension.

Width

FAA standards for runway width relate directly to the runway's Airport Reference Code.

- **Runway 14-32**—Runway 14-32 is currently 150 feet wide. The FAA standard width for runways accommodating ARC C-III aircraft is 100 feet. Although there could be some long-term cost savings in pavement maintenance by reducing the width to 100 feet, costs would be offset by having to move the runway lighting system. Furthermore, although the Boeing Business Jet is not regarded as the critical aircraft, its occasional operation at the airport is possible. The runway width standard for this size and weight aircraft is 150 feet. Given these factors, keeping the runway at its present 150-foot width is recommended.

- **Runway 5-23**—As originally constructed, Runway 5-23 was 150 feet wide. This width exceeds what is needed by the few aircraft using the runway. As a means of reducing costs at the time of a pavement slurry seal project in 1999, a decision was made to reduce the runway width. The fact that this runway is not lighted simplified this decision. Initially, a 75-foot width—consistent with ARC B-II standards—was considered. However, even though some pilot's flight guides continue to list the width as 75 feet, the width as actually constructed is 60 feet. The latter width is appropriate for the runway's ARC B-I (small) classification. The outboard 45 feet of original pavement on each edge remains in place as a shoulder.

Pavement Strength

The FAA Airport Master Record for Yuba County Airport provides the source of runway pavement strength data. No independent investigations were conducted as part of this *Master Plan* study.

Airfield pavements are rated according to the weight of the aircraft that they can accommodate on a regular basis. Aircraft with multi-wheeled main landing gear can be heavier than those with single-wheel landing gear because the loads are distributed over more wheels.

- **Runway 14-32**—The main runway is rated at 75,000 pounds for aircraft with single-wheel gear, 100,000 pounds for dual-wheel gear, and 150,000 pounds for dual-tandem-wheel gear. The runway strength is adequate to accommodate small- to medium-size business jet aircraft and occasional use by heavier aircraft such as the Boeing Business Jet. Therefore, no change in the present runway strength is recommended.
- **Runway 5-23**—This runway is listed as having a strength of 42,000 pounds for aircraft with single-wheel gear, 60,000 pounds for dual-wheel gear, and 95,000 pounds for dual-tandem-wheel gear. The runway strength is well above that needed for the small aircraft using it.

Approaches

Traffic Patterns

The established traffic pattern for all four runway ends is left-hand. The pattern altitude is 1,000 feet above the airport elevation (1,062 feet MSL) for light aircraft and 1,500 feet above airport elevation (1,562 feet MSL) for turbine-powered and large aircraft. No changes are recommended.

Instrument Approach Procedures

As listed in Chapter 1, five instrument approach procedures serve Yuba County Airport. Three procedures provide straight-in approaches to Runway 14 and two to Runway 32. The lowest approach minimums are associated with the precision instrument approach to Runway 14. This procedure has visibility minimums

as low as ½ mile with a decision height of 200 feet above the runway elevation. GPS and VOR approaches to Runway 14 are available as well. The GPS and VOR nonprecision approaches to Runway 32 both have visibility minimums as low as 1 mile. The GPS procedure has the better decision height minimum: 419 feet above the runway elevation.

No straight-in approaches are available for Runways 5 and 23. However, all of the Runway 14 and 32 approaches allow aircraft to circle to land at either end of the smaller runway. In each case, the visibility minimum is 1 mile and the decision height 478 feet above the runway elevation.

The established procedures serve the airport well. Given current technologies, no enhancements are necessary or anticipated. However, at such time as GPS is capable of providing precision instrument approach capabilities, an upgrading of the Runway 32 approach procedure may be possible. An enhanced nonprecision approach with lower visibility minimums (¾ mile) also may be possible. Either of these improvements would require installation of an approach lighting system at the runway's south end.

Runway Protection Zones

Runway Protection Zone Dimensions

Rwy End	*Inner Width*	*Outer Width*	*Length*
14	1,000 ft.	1,750 ft.	2,500 ft.
32	500 ft.	1,010 ft.	1,700 ft.
32*	1,000 ft.	1,510 ft.	1,700 ft.
5; 23	250 ft.	450 ft.	1,000 ft.

* With possible future nonprecision approach having ¾-mile visibility minimums

The sizes for the existing Runway Protection Zone (RPZ) at each end of the airport's four runway ends are set in accordance with the respective types of runway approaches:

- *Runway 14:* Precision;
- *Runway 32:* Nonprecision; and
- *Runways 5 and 23:* Visual.

The standard dimensions are listed in the adjacent table. Note that the applicable widths for the existing Runway 32 RPZ are reduced from earlier FAA standards (inner and outer widths of 1,000 feet and 1,425 feet, respectively) as reflected in previous Yuba County Airport layout plan drawings. However, upgrading of the approach to one with ¾-mile visibility minimums would require a larger RPZ. For long-range planning purposes, use of the larger dimensions (inner and outer widths of 1,000 feet and 1,510 feet, respectively) in conjunction with an eventual runway extension is recommended.

The function of RPZs is to enhance the protection of people and property on the ground near the ends of runways. FAA standards call for RPZs to be under control of the airport through fee title ownership or other means. RPZs ideally should be clear of all objects. However, certain low-intensity uses are generally considered acceptable on lands determined to be impracticable for the airport to acquire.

- **Runway 14**—All except two portions of the Runway 14 RPZ is on airport or other Yuba County property. An outer corner, consisting of an approximately 6.5-acre area lying west of Grand Avenue, encompasses all or portions of 24 private, mostly residential, parcels. A tiny piece of the RPZ's northeast corner lies on private property as well. The county has acquired avigation easements on all of this property. Also within the Runway 14 RPZ is 1,400 feet of Union Pacific Railroad right-of-way.
- **Runway 32**—The existing Runway 32 RPZ lies entirely on airport property. Even with a 1,000-foot extension and upgrading of the approach capabilities to ¾-mile visibility minimums, nearly all of the resulting RPZ would remain on airport property or within county road rights-of way. A major portion of the additionally affected area lies on the property south of Skyway Drive over which the county controls an avigation easement acquired in 1983. Approximately 2.5 acres of the future RPZ would extend onto private property east of Arboga Road. This area is part of an undeveloped 80-acre parcel, much of which falls along the extended runway centerline. With or without the proposed improvements at this end of the runway, fee title acquisition of the eastern portion of the parcel, approximately 49 acres, lying within 1,000 feet of the extended runway centerline is strongly recommended. Also recommended is acquisition of an approach protection easement on the western portion of the parcel. In addition to including standard avigation easement provisions which restrict the heights of structures in accordance with Federal Aviation Regulations Part 77 airspace surfaces, the approach protection easement should explicitly limit the types of land uses to ones that are compatible with the airport. Residential development should be prohibited.
- **Runway 5**—Approximately half of the RPZ is located on airport property owned in fee simple by the airport. Union Pacific Railroad right-of-way and parts of two undeveloped private parcels to the west of the rail line make up the remainder of the RPZ. Despite the low usage of this runway, the county should acquire an avigation easement on the uncontrolled property to ensure that no obstructions are created.
- **Runway 23**—About two-thirds of the RPZ is located on airport property owned in fee simple by the airport. The remainder includes the Arboga Road right-of-way and six private properties to the east. A house and two industrial buildings fall within the RPZ. To prevent future obstructions, county acquisition of avigation easements on this property would be prudent.

Approach Obstructions

Federal Aviation Regulations (FAR) Part 77, *Objects Affecting Navigable Airspace,* establishes standards for determining obstructions to navigable airspace near 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 runways.

Generally, most critical among FAR Part 77 surfaces are the approach surfaces extending outward and upward from 200 feet beyond each runway end. At Yuba County Airport, the Runway 14 approach surface has the shallowest slope—50:1 (1 foot vertically per 50 feet horizontally)—consistent with this runway's precision instrument approach capabilities. Runway 32 with its nonprecision approach has a 34:1 slope. The visual approach surfaces for Runways 5 and 23 have 20:1 slopes.

No comprehensive assessment of Yuba County Airport's approach surfaces has been conducted in conjunction with this Master Plan study. The last such survey is one done in 1993 by the National Ocean Survey, an agency of the U.S. Department of Commerce, and portrayed in the Obstruction Chart for the airport published by that agency. The chart shows that several trees penetrated the 50:1 approach surface for Runway 14, but that there were no obstructions to other runways. A copy of this chart is depicted herein as Figure 3C.

Although not available in a mapped format, a more recent review of the airport's approach surfaces is one conducted by the California Division of Aeronautics in March 2003 and summarized in the FAA Airport Master Record data sheet for the airport. This investigation indicated that the controlling obstacles for each runway end to be as follows:

- *Runway 14:* 75-foot tree, 3,200 feet from runway end (40:1 clear slope)
- *Runway 32:* 39-foot pole, 1,750 feet from runway end (39:1 clear slope)
- *Runway 5:* rail line, 800 feet from runway end (24:1 clear slope)
- *Runway 23:* 45-foot tree, 900 feet from runway end (15:1 clear slope).

Based on this data, the clear slopes for Runways 32 and 5 meet the respective approach slope requirements, but the trees in the approaches to Runways 14 and 23 are obstructions. As part of the master plan study, the status of these trees was checked. The Runway 32 approach was found to be clear. The tree in the

OC 664

AIRPORT OBSTRUCTION CHART
YUBA COUNTY AIRPORT, MARYSVILLE, CALIFORNIA

AIRPORT ELEVATION 62 FEET

AIRPORT PLAN

RUNWAY PLANS AND PROFILES

LEGEND

NOTES

AIRPORT OBSTRUCTION CHART

OPERATIONAL DATA

AMENDMENT DATA

DIMENSIONS AND ELEVATIONS ARE IN FEET

YUBA COUNTY AIRPORT, MARYSVILLE, CALIFORNIA

OC 664

MYV—OBST—CHART.DWG

Figure 3C

Obstruction Chart
Yuba County Airport

Runway 23 approach, on private property east of Arboga Road, continues to be an obstruction, however.

Threshold Siting Surfaces

A second set of criteria pertaining to approach obstructions are the criteria used in siting of runway thresholds. These criteria primarily come into play when obstructions to the FAR Part 77 surfaces are indentified, but may be significant in other instances as well. Unlike FAR Part 77 surfaces that remain tied to the runway end even when obstructions exist, threshold siting surfaces are associated with the threshold location and must be free of obstacle penetrations. Any penetration of the threshold siting surface requires that the threshold be displaced far enough to enable the threshold siting surface to clear the obstacle. In general, threshold siting surfaces are less restrictive than FAR Part 77 surfaces (they have a higher slope, are shorter and narrower, and may begin at the runway end rather than being offset 200 feet as is the case for FAR Part 77 surfaces). Thus, if the FAR Part 77 surface is unobstructed, the threshold siting surface usually will also be clear.

Based upon the previously mentioned Division of Aeronautics data as supplemented by the survey done during this master plan study, the threshold siting surfaces for Runways 14, 32, and 5 are clear of obstacles. In the approach to Runway 23, the tree mentioned as a Part 77 approach surface obstruction also penetrates the threshold siting surface.

Regardless of the recentness of official obstruction surveys conducted by federal and state agencies, it is incumbent upon Yuba County to make certain that the runway approach surfaces are kept clear of obstructions. Trees in particular need to be checked as often as necessary to make sure that they have not grown to an unacceptable height. If trees or other obstructions are situated on private property, the county should take abatement actions when needed to remove or reduce the height of these objects. County acquisition of avigation easements on critical properties would simplify the process of eliminating obstructions. Additionally, a thorough survey of objects within the Runway 32 approach surface will be necessary in conjunction with design of the proposed southward extension. As currently proposed, the future runway end will remain far enough from Skywest Drive that the road will not become an obstruction. However, other objects farther to the south may need to be removed or lowered in height to keep them from becoming obstructions.

Critical Areas and Setback Requirements

Runway Safety Areas

Runway Safety Areas (RSAs) are graded areas situated along the sides at the ends of runways. RSAs must be clear of objects except ones that must be located near the runway because of their aeronautical function. Under dry conditions, the area must be capable of supporting emergency equipment and the occasional passage of an aircraft without causing structural damage to the aircraft.

- **Runway 14-32**—For the ARC C-III precision runway classification applicable to Runway 14-32, the RSA is required to be 500 feet wide and extend 1,000 feet beyond the runway ends. Except for occasional erosion or growth of shrubbery requiring routine maintenance, the RSA for the existing length of Runway 14-32 meets FAA standards. Extension of the runway will necessitate grading of additional safety area southward to Skyway Drive.
- **Runway 5-23**—The required RSA dimensions for this runway's classification are a length of 240 feet beyond the runway ends and a width of 120 feet. Because the runway's original length and width have been reduced, the entire RSA falls on the pavement of the former runway and thus complies with FAA design criteria.

Object Free Areas

Like RSAs, Object Free Areas (OFAs) also surround runways and are to be clear of nonessential objects including parked airplanes. The major difference between these two critical areas is that the grading criteria for RSAs do not apply to OFAs. Ditches, for example, can be located in an OFA. Also, aircraft may taxi or hold within an OFA, but not an RSA.

- **Runway 14-32**—For Runway 14-32, the required OFA dimensions are a width of 800 feet and a length of 1,000 feet beyond the runway ends. For the existing runway length, the OFA meets applicable criteria. With extension of the runway to 7,000 feet, the fence along the north side of Skyway Drive may extend a few feet into one corner of the OFA. Subject to FAA acceptance, this deviation can be considered insignificant.
- **Runway 5-23**—OFA requirements for this runway are a length of 240 feet and a width of 150 feet. As with the RSA, this area is encompassed by the pavement of the old runway and meets FAA standards.

Obstacle Free Zones

A third critical area surrounding a runway is the Obstacle Free Zone (OFZ). OFZs are three-dimensional—consequently, short objects may be acceptable in places where taller objects may not be. Only frangibly mounted navigational aids are allowed to penetrate an OFZ. Other objects, including taxiing or parked airplanes, are not permitted.

- **Runway 14-32**—The plan view and cross-section of the OFZ applicable to Runway 14-32 are as shown in Figure 3D. At the approach end of Runway 14, the existence of the approach lighting system and approach minimums below ¾ mile dictate the need for an additional section of OFZ, the inner-approach OFZ. This OFZ segment slopes upward at a rate of 50:1 and extends 200 feet past the last unit of the approach lighting system, a total distance of 2,600 feet beyond the runway end. No similar inner-approach OFZ exists at the approach end of Runway 32 because this runway end does not have an approach lighting system. However, for the approach minimums at this end of the runway to be reduced to ¾ mile as discussed earlier in this chapter, an approach lighting system would be required and inner-approach OFZ criteria would apply.

  The existing Runway 14-32 OFZ is in compliance with the applicable design standards.

- **Runway 14 Precision OFZ**—As of January 2007, runways having a vertically guided approach have a precision OFZ (POFZ) in effect when the reported ceiling is below 250 feet and/or the visibility is less than three-quarters statute mile plus an aircraft is on final approach within two miles of the runway. The POFZ is 800 feet wide and extends 200 feet backward from the threshold. At some airports, the POFZ conflicts with holding bay usage. FAA standards dictate that the fuselage and tail of a holding aircraft must not impinge upon the POFZ, although a wing may do so. A POFZ exists at the approach end of Runway 14 at Yuba County Airport under the conditions indicated. Holding aircraft and other objects do not interfere with the clearance requirements.

- **Runway 5-23**—For runways with approach minimums greater than ¾ mile visibility and serving small aircraft with approach speeds greater than 50 knots, the OFZ is 250 feet wide for the entire length of the runway and extends 200 feet beyond each end of the runway. The Runway 5-23 OFZ more than meets these requirements.

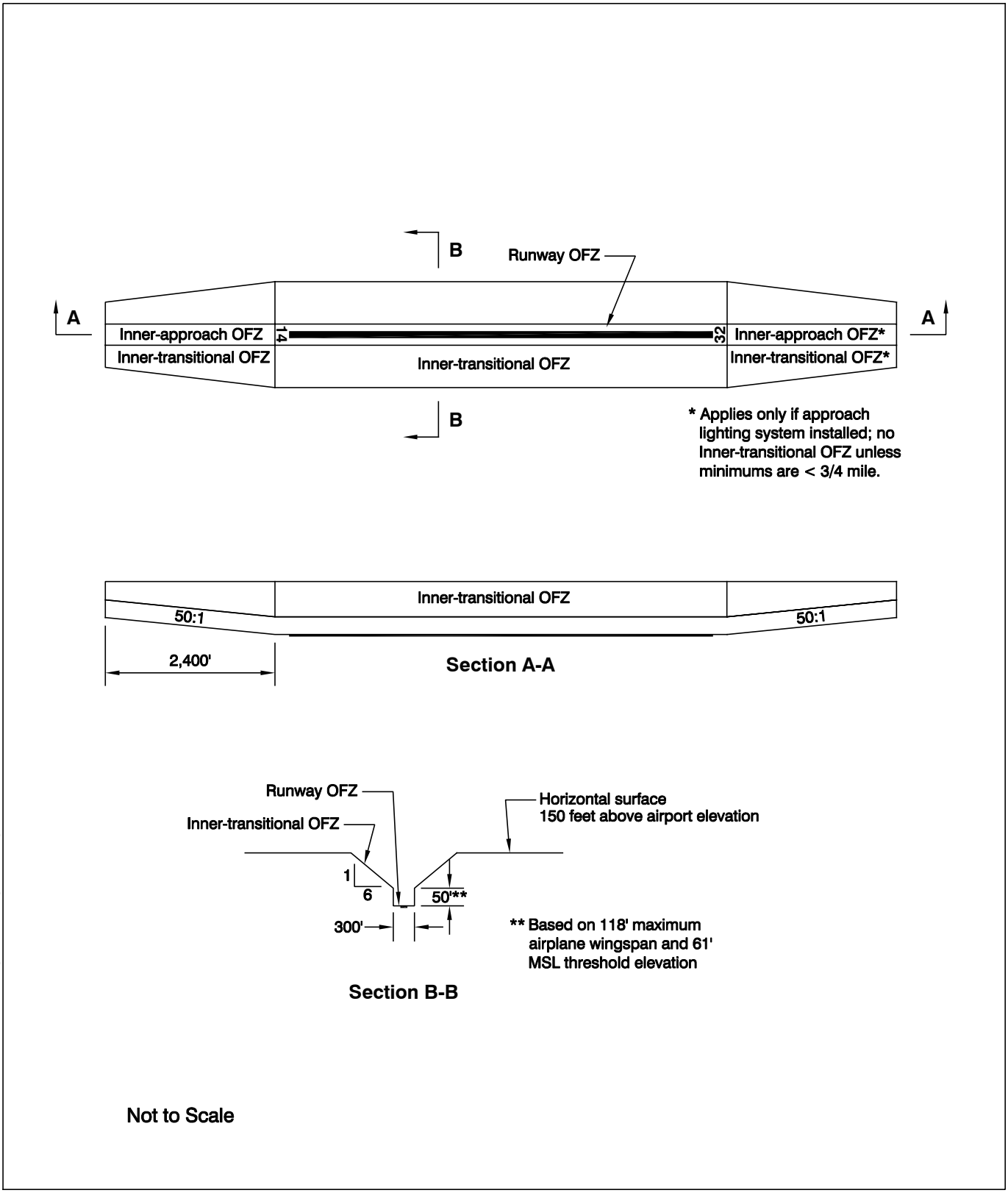


Figure 3D

Obstacle Free Zone

Runway 14-32

Building Restriction Line

The building restriction line (BRL) establishes the closest location that buildings can be placed relative to a nearby runway or, in some cases, a primary taxiway. The FAA no longer defines a specific BRL setback distance standard, but rather provides guidance on factors to be considered in determining the BRL location.

- **Runway 14-32—**At Yuba County Airport, the BRL for Runway 14-32 has historically been set at 750 feet from the runway centerline. This distance is the former FAA standard for runways having precision instrument approaches. At this distance, a 35-foot tall building situated at the same elevation as the runway would not penetrate the 7:1 transitional surface of FAR Part 77. Because several of the existing buildings are set approximately along this line and not any closer, the effect is to create a visually uniform "flight line" facing the runway. Continued application of the established 750-foot BRL location for Runway 14-32 is recommended.

- **Runway 5-23**—As a visual runway, Runway 5-23's BRL can be much closer to the runway than possible for Runway 14-32. Using transitional surface clearance of a 35-foot building as the criterion, the BRL would be 370 feet from the runway centerline. This BRL location is recommended for depiction on the Airport Layout Plan drawing. As a practical matter, however, the required setback distance from Taxiway B is the determinant of where buildings can be placed south of the runway.

- **Runway Intersection**—When an airport has intersecting runways, an additional factor must be considered with regard to the BRL placement. As specified in the FAA's *Airport Design* Advisory Circular, buildings must not be situated such that they prevent the pilot of an aircraft on one runway from seeing an aircraft on the intersecting runway. The exact requirements vary depending upon the distance between the runway intersection and the end of each runway.

  At Yuba County Airport, the runway intersection line-of-sight requirement is an issue only with respect to the southeast quadrant. With the existing length of Runway 14-32, the sight line has minimal effect. The proposed extension of this runway pushes the sight line farther southeastward, but the effect remains minimal provided that the setback from the runway is held to 750 feet. Both the existing and the future BRLs are shown on the Airport Layout Plan.

Other Runway Features

Blast Pads

Blast pads consist of light-duty pavement situated beyond the ends of runways. They serve to minimize erosion and the blowing of dirt and debris from unprotected ground that result when aircraft, particularly jets, apply full power to initiate their takeoffs. Although paved, blast pads are not usable by aircraft under normal circumstances and are not included in the runway length.

- **Runway 14-32**—Neither end of Runway 14-32 currently has a blast pad. With increased jet activity in the future, construction of blast pads will be warranted. At such time as the runway is extended, a blast pad should be added at each end.

- **Runway 5-23**—Although not needed considering the minimal usage that this runway receives, the past shortening of the runway length effectively created blast pads at each end.

Marking

- **Runway 14-32**—The runway is marked with precision instrument runway markings. The markings were reported to be in fair condition when the airport was inspected in 2003 by State of California Division of Aeronautics personnel.

- **Runway 5-23**—Runway 5-23 is marked with basic runway markings. Together with the pavement resurfacing, threshold bars, chevrons, and edge striping serve to delineate the reduced length and width of the runway. The markings are in good condition.

Lighting

- **Runway 14-32**—This runway is equipped with a high-intensity runway edge lighting system (HIRL) installed in the early 1980s. The lighting is pilot controlled together with the VASIs. No improvement needs have been identified.

- **Runway 5-23**—The crosswind runway is not lighted. Given the runway's minimal usage, lighting would provide little benefit and none is recommended.

Electronic Navigational Aids (NAVAIDS)

- **Runway 14 ILS**—Runway 14 is equipped with a Federal Aviation Administration-owned and maintained Category I instrument landing system (ILS). The ILS consists of;

- A glide slope (GS) antenna west side of the runway, 1,000 feet from the approach end of the runway;
- A localizer (LOC) antenna situated 1,000 feet beyond the runway's south end;

The proposed southward extension of the runway will necessitate moving the localizer to a point just north of Skyway Drive. Because a road normally cannot pass between the localizer and the runway end, the requirements for siting of this equipment and for a clear area around it are among the factors affecting the length to which the runway can be extended without realignment of Skyway Drive.

Middle marker (MM) and locator outer marker (LOM) beacons were formerly also components of the Runway 14 ILS. These types of facilities have been de-commissioned at many airports. Yuba County Airport approach plates in early 2008 do not show these beacons. Also no longer in service is the Non-Directional Beacon (NDB) that was collocated with the LOM.

- **Terminal NAVAIDS**—Also situated on the airport is a Very-High-Frequency Omnidirectional Range (VOR) antenna located just northwest of the runway intersection. This NAVAID supports the Runway 32 VOR approach described earlier in this chapter.

Visual Approach Aids

- **Runway 14-32**—As required for the precision instrument approach, an approach lighting system—specifically, a medium-intensity approach lighting system with runway alignment indicator lights (MALSR)—is installed at the approach end of Runway 14. The light bars, spaced 200 feet apart, extend outward to a distance of 2,400 feet from the runway end. This end of the runway also is equipped with runway end identifier lights (REIL). Additionally, both ends of the runway have four-box visual approach slope indicators (VASI-4L) with approach slopes set at 3.0°.
- **Runway 5-23**—No visual approach aids are installed on this runway and none are needed.
- **Rotating Beacon**—A standard green-and-white rotating beacon, located on the top of the control tower building, helps pilots to find the airport at night.

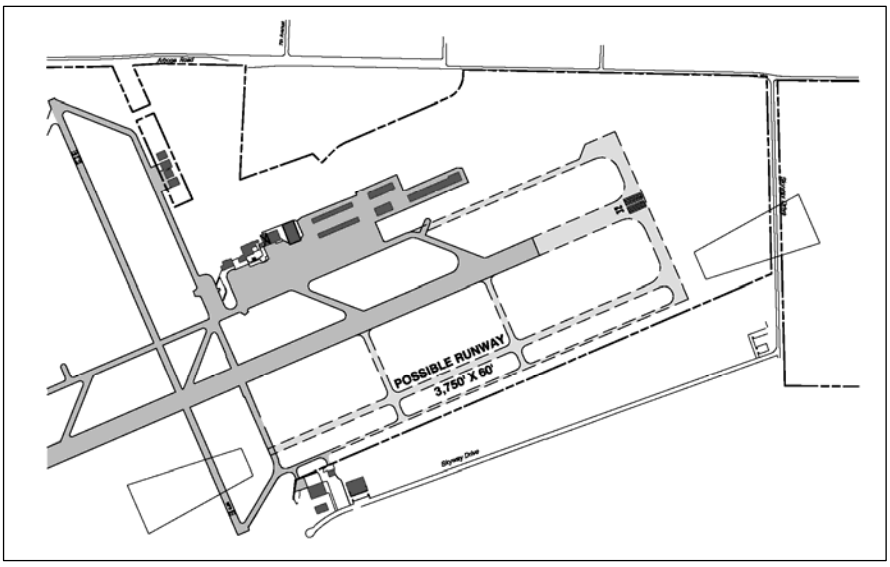
Future Parallel Runway

Planning for a future third runway at Yuba County Airport goes back to at least 1970. The Master Plan Study completed in that year projected that aircraft activity would reach a level warranting construction of a parallel runway by the mid 1980s. The proposed design called for a 3,750-foot runway situated 700 feet west of Runway 14-32. The same design concept was carried forward into the 1986 Master Plan even though updated forecasts indicated that the additional operational capacity not be needed until beyond the 20-year time

frame of the plan. The argument was made that other advantages—such as separation of jet operations from smaller aircraft—could justify earlier construction of the parallel runway.

Current circumstances are similar to those of 1986. FAA guidance suggests that planning for additional runway capacity begin when aircraft operations reach 60% of the existing capacity. This *Master Plan* forecasts a 20-year demand of some 57,000 operations—only 25% of the theoretical capacity of the existing runway system. The demand for a parallel runway thus remains well beyond the 20-year planning time horizon. On that basis, another runway is not depicted on the Airport Layout Plan drawing accompanying this *Master Plan*.

That said, continuing to allow for a future parallel runway is appropriate for several reasons. First, even though undoubtedly beyond 20 years, an eventual need for a parallel runway should be anticipated. This need could arise because of overall activity growth or because of a substantial volume of jet flights and the benefits of keeping it separate from small airplane operations. Another factor, addressed more fully in the next chapter, is that the placement of the industrial park west of the parallel runway site effectively precludes alternative uses for the site. Thus, the cost of preserving the opportunity for a future parallel runway is minimal. The diagram below shows the configuration that this runway could eventually take.



Future Runway Configuration

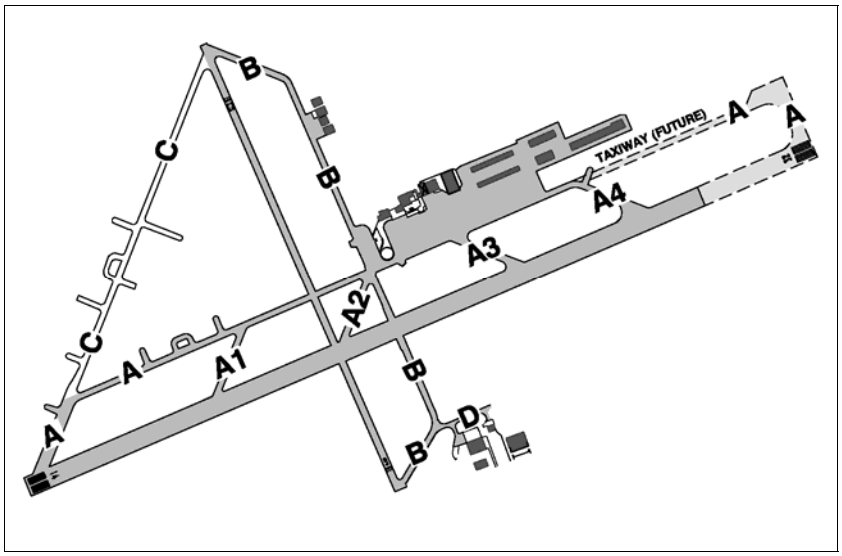
TAXIWAYS

Taxiways provide the linkages by which aircraft travel between runways and parking facilities in the airport building area. At Yuba County Airport, this system consists of major taxiways paralleling each of the runways together with various secondary taxiways.

Taxiway Designations

Taxiways are generally labeled with letters of the alphabet in accordance with criteria outlined in FAA Advisory Circular 150/5340-18C, *Standards for Airport Sign Systems*. The two parallel taxiways at Yuba County Airport are designated Taxiway A along the east side of Runway 14-32 and Taxiway B south of Runway 5-23. The only other presently labeled taxiway is Taxiway C—it extends between Taxiway A and the approach end of Runway 23, but is no longer in use.

No formal designations have been established for the three exit taxiways angling from the middle section of Runway 14-32. Designations should be established for these taxiways in accordance with FAA standards. The taxiway system improvements described earlier in this section will need to be recognized in the labeling scheme. Existing and recommended taxiway designations are as indicated in the diagram below.



Taxiway Designations

Runway 14-32 Taxiway System

A parallel taxiway, designated Taxiway A, runs nearly the full length of Runway 14-32 and provides access to each end. Four mid-field exit taxiways, as well as a segment of Runway 5-23, connect the taxiway and runway at other points.

Runway-to-Taxiway Separation

The distance from the centerline of Runway 14-32 to Taxiway A is 512 feet. For runways classified as ARC C-III, the FAA standard for this separation is only 400 feet. At the time of the last pavement maintenance work on Taxiway A, consideration was given to the option of moving the taxiway closer to the runway. For cost reasons, the decision made was to leave the taxiway in its existing location.

Looking at this issue more broadly, two additional factors can be pointed out. One is that this change would allow expansion of the aircraft apron area in the southeast quadrant. Second is that no additional space usable for building sites would be created as long as the building restriction line remains at 750 feet from the runway. Given that the *Master Plan* forecasts and the assessment of tiedown demand outlined in the next chapter indicate no need for expansion of the apron area, relocation of Taxiway A would provide no significant benefit. This issue can be revisited again in the future in light of the facility demands evident at that time.

Taxiway Object Free Area

As presently configured, the distance from the centerline of Taxiway A to adjacent aircraft parking positions and the wind cone north of aircraft apron is approximately 68 feet. This amount of wingtip clearance is ample for the current mix of aircraft using the airport. It meets FAA standards for aircraft with wingspans up to 93 feet, the size of a Gulfstream 5. However, to fully meet ARC C-III criteria—that is for aircraft with wingspans up to 118 feet—an object free area setback of 93 feet is required.

Considering that the apron area is not used to capacity except during the annual air show, an interim solution would be to remove the tiedown chains from the parking spots closest to the taxiway. About 10 spaces are affected. At such time as apron pavement work is accomplished, the aircraft parking limit line should be moved to 93 feet from the taxiway. The wind cone and segmented circle should be relocated at that time as well. Any new construction should hold to the 93-foot setback requirement.

Exit Taxiways and Holding Bays

The two end and four mid-field taxiways that serve as exits from Runway 14-32 are appropriately spaced to minimize the time needed for aircraft to exit the runway after landing. Two shortcomings are noted, however.

- **South Entrance Taxiway**—The southernmost exit taxiway also serves as the entrance to Runway 32. However, it enters the runway some 600 feet north of the runway end. Aircraft taking off on Runway 32 thus either lose a corresponding amount of runway or they must taxi to the runway end and then execute a 180° turn on the runway. The result is increased runway occupancy time, reduced runway capacity, and an adverse affect on safety. An added drawback is that this entrance taxiway intersects the runway at a 45° angle rather than 90° as current FAA guidance (Engineering Brief No. 75, "Incorporation of Runway Incursion Prevention into Taxiway and Apron Design," November 8, 2007) strongly recommends for entrance taxiways. The modest activity levels at the airport and the fact that a minority of operations are on Runway 32 minimizes this concern. Also, ultimately, when the runway is extended southward as proposed, the last exit/entrance taxiway would be at the new runway end and this shortcoming will be eliminated. Nevertheless, given current FAA guidance and the likelihood that a runway extension will not occur until the latter part of the master planning time frame, construction of a new exit/entrance at the present runway end is proposed. An opportune timing for this project would be when Taxiway A is extended southward to serve building area expansion as discussed later in this chapter.

- **North Entrance Taxiway**—The north exit/entrance taxiway also intersects the runway at a 45° angle although, unlike at the south, almost at the runway end. To comply with FAA guidance, the entrance should be realigned by extending the parallel portion of Taxiway A and adding a new 90° taxiway. The pavement of the existing entrance taxiway should be physically removed.

- **Midfield Exits**—The existing midfield exit taxiways for Runway 14-32 are well placed to facilitate expeditious exiting from the runway for light aircraft landing from the north, the predominant direction of operations. Taxiways A1 and A2 are angled at 45° to the runway and serve as high-speed exits. Taxiway A3 serves similarly for light aircraft landing from the south, but is angled backwards for larger aircraft that do not make the earlier exits when landing from the north. Opposite direction use of any of these exits by large aircraft is complicated by the minimal curved fillet section where the taxiway pavement and runway

pavement intersect. Keeping all three midfield exits in their present locations and alignments is recommended. However, the radius of the fillets should be widened to better serve large aircraft.

- **Holding Bays**—Holding bays provide a location where aircraft can conduct pre-flight run-ups or wait for instrument departure clearance without blocking access to the runway by other aircraft. Typically, holding bays are situated along the taxiways that serve the ends of the runway. No holding bays exist along the taxiways serving Runway 14-32 at Yuba County Airport. Given the airport's relatively low activity level, this deficiency has not posed significant problems. Also, the extra-wide dimension of Taxiway A where it enters the north end of the runway—the predominant access point for departures—allows a small aircraft to pass by another that is not yet ready for takeoff. However, with the projected future activity increases and particularly with greater usage by larger aircraft, standard holding bays will be needed near each end of the runway. At the north end, the holding bay would be adjacent to the extension of Taxiway A required to enable a 90° runway entrance. Consideration also should be given to constructing a holding bay at the present south end of the runway if extension of the runway is not a near-term prospect at the time that a new south exit/entrance taxiway is constructed as described above.

Other Features

- **Width**—Except for its northernmost end where it connects with the approach end of Runway 14, Taxiway A and its three angled runway exit taxiways are 50 feet wide as originally constructed. The northern segment is 100 feet wide. The 50-foot width equals the FAA standard for ARC C-III. No changes are recommended.
- **Lighting**—The full length of Taxiway A, including its connections to each end of Runway 14-32, is equipped with medium-intensity taxiway lighting (MITL). However, none of the midfield exit taxiways are lighted. Installation of lighting on these taxiways (A1, A2, B, and A3) is recommended.
- **Marking and Hold Lines**—Taxiway A and the Runway 14-32 exit taxiways are marked with centerline and edge stripes in accordance with FAA standards. Hold lines, as required by FAA standards, are marked on each of the seven locations where a taxiway intersects with the runway. The hold lines are marked 250 feet from the runway centerline, consistent with the standards applicable to Runway 14-32.

Future Extension

The proposed 1,000-foot southward extension of Runway 14-32 will necessitate a corresponding extension of Taxiway A to the new runway end. A Taxiway A extension will also be required in support of the southward expansion of the southeast quadrant building area as described in Chapter 4. Indeed, the timing for this project could be dictated by building area development needs sooner than the runway extension is accomplished.

Runway 5-23 Taxiway System

Access to each end of Runway 5-23 is provided by Taxiway B. This runway is also served by Taxiway A and one of the Runway 14-32 exit taxiways (Taxiway A2).

Classification

On the basis of its association with Runway 5-23, Taxiway B might be classified as an ARC B-I (small) facility. However, Taxiway B has an equally important function as a crossfield connector. It provides access to the executive hangar area on the north side of the airport's southeast quadrant as well as to off-airport aviation-related uses in the southwest quadrant. In this capacity, Taxiway B needs to be capable of accommodating aircraft larger than those in Design Group I. Considering the character of the development proposed for the portions of the airport building areas that it serves, Taxiway B should be designed to at least meet ARC B-II standards. This classification affects the runway-to-taxiway separation, the pavement width, setback distances, and other features as discussed in the following text.

Runway-to-Taxiway Separation

The separation between Runway 5-23 and Taxiway B is 512 feet. This distance is far in excess of the ARC B-I (small) standard of 150 feet and even more than double the 240-foot distance required for ARC B-II. Unlike the situation with Taxiway A where the building restriction line would not move even if the runway-to-taxiway separation were to be reduced, repositioning of Taxiway B would potentially provide additional usable building sites within the southeast quadrant. Since the reasons for considering such a modification are driven by building area considerations, the discussion of this issue is found in Chapter 4 rather than here. It can be noted, however, that the conclusion reached in that analysis is that no strong reasons to relocate Taxiway B are apparent at least within the near term.

Other Features

- **Width**—Taxiway B is 50 feet wide. This width exceeds the 35-foot width standard for the recommended ARC B-II of this taxiway. If the cost of maintaining the extra 15 feet of pavement is significant, consideration should be given to reducing the width at such time as pavement work is needed. Otherwise, the existing 50-foot width should be continued.

- **Exit/Entrance Taxiways and Holding Bays**—The new FAA guidance noted above with regard to the Runway 14-32 taxiways also fundamentally applies to the Runway 5-23 taxiways. The very low usage of Runway 5-23, though, does not warrant the expense of realigning the entrance taxiways. Holding bays are similarly unnecessary and Taxiways A and A2 provide adequate midfield exit points.

- **Taxiway B Extension**—An approximately 500-foot eastward extension of Taxiway B will be required for access to the hangar parcels within Industrial Park Site No. 2.

- **Taxiway Object Free Area**—The ARC B-II standard for taxiway centerline to a fixed or moveable object is 65.5 feet. The nearest objects to Taxiway B are the executive hangars in the southeast quadrant. These are approximately 112 feet from the taxiway centerline. The property line in front of these hangars has been set at a distance of about 74 feet from the taxiway centerline. These setbacks are adequate.

- **Lighting**—Taxiway B is presently unlighted. For the purpose of access to Runway 5-23 which also is unlighted, there is no basis for installation of taxiway lighting. However, lighting of the segments of Taxiway B that provide building area access would be beneficial in conjunction with further development of this area.

- **Marking and Hold Lines**—Taxiway B has centerline and edge stripe markings in accordance with FAA standards. These markings continue onto the former portion of each end of the runway that serves as a lead-in taxiway. The hold lines are set at 200 feet from the centerline of Runway 5-23. This distance is 75 feet more than what is needed for the runway's ARC B-I (small) classification, but presents no constraints given the excess distance between the runway and taxiway. The 200-foot distance is consistent with ARC B-II criteria and is reasonable to continue as long as the taxiway is not relocated as discussed above and in Chapter 4.

- **Exit Taxiways and Holding Bays**—Taxiways A and A2 provide adequate midfield exit points for Runway 5-23. The runway's low usage does not warrant additional exits. This factor also applies to the need for holding bays—none exist, but neither are they necessary.

Other Taxiway System Components

Taxiway C

Taxiway C traverses the airport's northeast quadrangle, connecting the approach end of Runway 23 with Taxiway A near the approach end of Runway 14. Other than use during the annual air show and occasionally by agricultural applicators at other times of the year, the taxiway is considered formally abandoned. Both ends are marked with an 'X.'

Except perhaps for a portion at each end, no future use for this taxiway is foreseen. Any eventual development of the northeast quadrant would require that Taxiway C be severed in order to provide road access to the interior of this area.

Taxiway System Expansion Needs

Other than extensions of Taxiways A and B as discussed earlier, no additions to the primary taxiway system are judged likely to be required within the 20-year master planning time frame. However, certain taxiway system expansion needs could arise in conjunction with currently unanticipated aviation-related development of portions of the airport away from the southeast core area.

- **Southwest Quadrant**—The most plausible exception to the preceding statement concerns the stub taxiway (Taxiway D) serving the west-side industrial tract. This taxiway is presently just 500 feet long and serves only the two northernmost parcels. All of the parcels in the tract adjoin airport property and could obtain taxiway access by extension of Taxiway D. The alignment of Taxiway D is set so as also to serve as a parallel taxiway for a third runway if one should ultimately be constructed. The present segment is 25 feet wide, consistent with ARC B-I standards. Any demands for use of this taxiway by larger aircraft would require additional width.

- **Northeast Quadrant**—Any eventual aviation-related development of this area could dictate the need for a parallel taxiway on the north side of Runway 5-23. Specific requirements can be evaluated at such time as particular uses of this site become identified.

- **Northwest Quadrant**—No taxiway access to the northwest quadrant is presently available. Aviation-related use of this area is not envisioned. If this status should change, however, taxiways potentially could be extended from the approach end of Runway 14 or Runway 5.

OTHER AIRFIELD COMPONENTS

Signage

FAA standards for airfield signage are set forth in Advisory Circular 150/5340-18C, *Standards for Airport Sign Systems*. These standards mandate installation of certain instructional signs at all airports. Other types of signs provide guidance to pilots. These signs are recommended at all airports, but required only at airports that are certified for commercial air passenger operations under FAR Part 139. Yuba County Airport is not a Part 139 airport.

The mandatory signs are considered essential for airport safety. Among these are:

- Holding position signs at taxiway intersections with runways;
- Holding positions signs at intersections between runways; and
- Holding position signs for ILS Critical Areas.

Recommended signs include ones that show the designation of or direction to runways and taxiways. For runways used by turbojet aircraft, runway distance remaining signs are also recommended. All signs on lighted runways or taxiways should be lighted.

Yuba County Airport currently does not have any sign system, either mandatory or recommended. A sign plan should be prepared for the airport and all signs required or recommended by the FAA should be installed in the near term.

Helicopter Takeoff and Landing Area

Currently, no helipads—spots designated for helicopter takeoffs and landings—are established on the airport. Helicopters either make approaches to one of the runways, then hover taxi to a parking place, or, under good-visibility, daylight conditions, may fly directly to near where they intend to park. Most of the present helicopter activity is associated with two users. One is a specialty FBO that does business from one of the executive hangars situated along the eastern portion of Taxiway B. The second is REACH Air Medical Services. In early 2007, REACH constructed a base

adjacent to Taxiway B east of Taxiway A. The facility includes helicopter parking, but not a designated helipad.

Other than the activity associated with the two tenants, helicopter usage of Yuba County Airport is expected to remain low throughout the forecast period. If conditions should change, construction of a helipad with adjacent parking positions would be desirable. A suitable site would be near the intersection of Taxiways A and B as shown in the conceptual core area build-out plan included in the next chapter. This location is just west of the present REACH helicopter apron.

Supporting Facilities

- **Wind Indicators**—Four wind cones are located at the airport. The primary wind cone is collocated with the segmented circle, near midfield at the intersection of Taxiways A and B. Two others are found near the approach ends of Runways 14 and 32. The fourth is on top of one of the FBO hangar buildings. Only the wind cone at the segmented circle is lighted.

- **Radio Communications**—Because the control tower is open only during the annual air show, pilots using the airport communicate directly with each other via a common traffic advisory frequency (CTAF). Additionally, personnel at the primary FBO use this frequency as a UNICOM to provide advisory information to pilots approaching the airport.

- **Automated Surface Observing System (ASOS)**—The Yuba County Airport ASOS provides real-time weather observations including temperature, dew point, wind speed and direction, altimeter setting, visibility condition, and precipitation. This data is communicated to pilots by an automated, continually updated, radio broadcast and also is available by telephone. Most of the sensor equipment used to gather the weather data is located in the airport's northeast quadrant.

- **Remote Transmitter/Receiver (RTR)**—The purpose of RTRs is to facilitate radio communications between pilots of aircraft on the ground and FAA air traffic controllers or flight service stations. They are needed at airports where reception from the ground is poor. At Yuba County Airport, an RTR antenna is situated along Taxiway C near the northeast property line.

- **Compass Rose**—Consisting of a symbol painted on airfield pavement, a compass rose is used by aircraft maintenance personnel to verify the accuracy of the magnetic compass in aircraft. One was marked on the old airline apron adjacent to

Taxiway B, but it has recently been mostly obliterated by construction of the REACH helicopter parking pad. A convenient new location that is not in the way of taxiing or parked aircraft should be found.

4

Building Area Development

4

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. Undeveloped non-airfield land is included together with built-up areas. Common uses of building area land at general aviation airports similar to Yuba County Airport are listed in the box to the right.

This chapter examines the factors that affect the siting and development of future building area facilities at Yuba 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.

A detailed proposed layout of most future development within the core building area is not included in this report. Recommendations are limited to a basic development framework emphasizing site suitability for various uses and locations of primary taxilanes and access roads. A sketch of possible ultimate development is included for illustrative purposes only. Follow-up studies will be needed to expand upon the basic framework and to determine the locations and site layouts of specific facilities.

Typical Building Area Functions at General Aviation Airports

Commonly Found Facilities:

- Based aircraft tie downs and storage hangars
- Transient aircraft parking
- Administration building or airport office
- Pilots' lounge / flight preparation room
- Public rest rooms / public telephones
- Fixed base operations facilities
- Fuel storage and dispensing equipment
- Aircraft washing area
- Security/perimeter fencing and access gates
- Access roads and automobile parking

Other Facilities Common at Larger Airports:

- Corporate aircraft storage hangars and offices
- Air traffic control tower
- Emergency response equipment and storage facility
- Coffee shop or restaurant
- Rental car facilities
- Air freight handling facilities
- Commercial/industrial buildings

FACILITY REQUIREMENTS

Numerous facilities are essential to accommodation of future demands for both aviation-related and nonaviation use of the airport building area. Identifying these needs is an essential component of facility planning. County staff, pilots, and other airport users

provided input to this assessment of the future facility requirements at Yuba County Airport.

Aircraft Parking

If nearby Sutter County Airport were to close—a scenario currently viewed as possible, though not probable—as many as 100 of its based aircraft might relocate to Yuba County Airport. The implications of this prospect are addressed only in a general manner as part of this *Master Plan*. No detailed plans for accommodating this heightened demand are presented.

Aircraft parking constitutes the most extensive aviation-related use of building area land at Yuba County Airport. Additional space will be required to meet future demands. As of early 2008, there are about 100 aircraft based at the airport. The *Master Plan* forecasts expect at least 50 more aircraft by the end of the 20-year planning period. Additionally, peak-period transient aircraft parking demand is projected to increase from 15 to about 25 during this period. Several types of facilities will be needed to accommodate this demand.

Aircraft Hangars

As is the case at most general aviation airports, the demand for aircraft parking space at Yuba County Airport is primarily for hangars. Aircraft storage hangars can be grouped into five general categories, of which only two are currently found at the airport:

T-Hangar

Executive Hangar

Corporate Hangar

- **T-Hangars**—T-hangars are the most common form of aircraft storage at most general aviation airports including Yuba County Airport. The back-to-back arrangement of the individual T-shaped bays is efficient from a structure-size standpoint, but requires taxilane access on both sides of the building. For reasonable economy of construction, T-hangar buildings preferably should contain at least 10 aircraft bays.

- **Rectangular "Executive" Hangars—**Rectangular-shaped hangar units are well-suited to locations where access is practical to only one side of the building. The hangar bays are larger than typical T-hangar units and usually are designed to accommodate twin-engine airplanes or small business jets. Alternatively, they sometimes are used for storage of two or three smaller aircraft. The buildings may consist of either single or multiple bays. Some executive hangars have small office areas attached. At Yuba County Airport, the four individual hangars along Runway 5-23 can be considered executive hangars, although two are currently used by fixed base operators. The six-bay building completed in 2003 and eight units completed in early 2008 also fit into this category.

- **Conventional "Corporate" Hangars**—Corporate hangars are large, free-standing structures intended to house large business jets or multiple smaller aircraft. A size of 100 square feet is common at many general aviation airports, although the buildings can be somewhat smaller or considerably larger. Office

and pilots' lounge areas typically are attached. Also, corporate hangars usually have an adjacent parking area that vehicles can access without the need to pass through a security gate.

- **Shade Hangars**—Shade hangars are similar to T-hangars except that they do not have doors or interior partitions. They help keep the sun and rain off the aircraft, but do not provide the security afforded by an enclosed T-hangar. Shade hangars can be constructed advantageously on existing apron pavement in that water drainage through the building is not a concern. Compared to T-hangar construction where existing pavement must be removed and the site regraded, shade hangars may cost only half as much. On raw ground, the differential between the two types is only about 20%. Another good application of shade hangars is in locations where the mass of an enclosed building would act as a visual barrier. Yuba County Airport does not have hangars of this type at present.


Shade Hangar

- **Individual "Portable" Hangars**—Portables are small, individual hangars designed to be constructed elsewhere and hauled to the airport. They typically are T-shaped, but can be rectangular. An advantage of portables is that they can economically be added in increments of just one unit at a time (the cost per unit, though, is similar to or even higher than the cost of an individual unit in a multiple-unit T-hangar building). Most often they are owned individually rather than by the airport or a hangar developer. Portables also have the advantage of being capable of installation almost anywhere on the airport, including on existing apron pavement or on unpaved areas. A chief disadvantage is that their inconsistency of appearance and often poor maintenance can make them unattractive. No portable hangars are currently located at Yuba County Airport.


Portable Hangar

Presently, there are approximately 101 hangar spaces at Yuba County Airport: 59 T-hangar units and some 42 spaces in executive hangars. All are in use and some 30 aircraft are on waiting lists. Although the real unmet demand is undoubtedly less than 30—aircraft owners often add their names to the list at several airports—a significant near-term need for additional hangar capacity is apparent. Over the 20-year time frame of the *Master Plan*, a reasonable assumption for planning purposes is that hangar space will be required for essentially all of the 50 additional aircraft expected to be based at the airport.

The greatest need will continue to be for T-hangars. Alternatively, shade hangars may be desirable for a portion of this demand. Portable hangars should continue to be excluded from the airport.

Sites for additional executive hangars have already been established adjacent to the existing buildings along Runway 5-23. All of these

sites have been sold, however. Provision of additional sites for similar buildings thus is warranted. Lastly, several larger sites suitable for corporate hangars should be included in the airport building area plans.

Aircraft Apron

Tiedown Apron

Spaces for based and smaller transient aircraft are normally equipped with tiedown anchors and chains or ropes to prevent the aircraft from being blown around by strong winds.

Airports need paved apron areas for parking the portion of their based aircraft fleet that is not hangared, as well as for short-term usage by transient aircraft visiting the airport. The Yuba County Airport apron occupies about 9.3 acres and, as currently configured, can accommodate approximately 77 based and transient aircraft.

Less than a dozen of the 100+ aircraft based at the airport are parked on the tiedown apron. Peak demand for transient aircraft parking is estimated at 15 spaces. This leaves some 50 to 55 spaces presently unutilized.

Assuming that adequate hangar capacity is constructed to meet future demand, the demand for based aircraft tiedown space is expected to remain roughly constant throughout the 20-year planning period. An additional 10 spaces for transient aircraft are projected to be required over this time frame. At least 5 spaces should be capable—in terms of wingtip clearances and pavement strength—of accommodating turboprop and business jet aircraft. One or two spots suitable for helicopters to park also are desirable. Ideally, helicopters should be able to access these spots without getting near parked airplanes.

Beyond these normal usage requirements are the needs of the annual air show. During the show, the apron area is used only for the display aircraft. Parking for the many other aircraft that transport people coming to see the show is in the airport's unpaved, northeast quadrant. No construction of permanent parking areas for use only during the air show is contemplated. However, as facilities are built for other purposes, the needs of the air show should be taken into account. Unless better alternatives are unavailable, development that would conflict with the air show requirements should be avoided.

Aviation Support Facilities

Although aircraft parking occupies the majority of aviation-related building area land at general aviation airports, various other facilities serve essential supporting functions. Among the aviation support facilities that exist and/or may be necessary at Yuba County Airport are the following:

Airport Administration Building

Many general aviation airports have an administration building that houses not only the airport management offices, but also a pilots' lounge, rest rooms, and other facilities for pilots and the general public. Sometimes a coffee shop or restaurant is included.

Presently, Yuba County Airport has only a small office building for airport offices. Other functions are provided by the primary fixed base operator. Although a multi-function administration building is not a necessity, enhancement of the existing facilities is needed. Consideration should be given to expansion of the airport office space and provision of a meeting area. Also, if the airport is to draw more transient activity, new, more attractive facilities for pilots and other visitors should be planned. An administration building should be centrally located with good access both to the transient aircraft apron and to automobile parking.

Fixed Base Operations (FBO) Facilities

Fixed base operators constitute the commercial side of general aviation business. They provide a wide variety of facilities and services for pilots and their aircraft (see adjacent box). Busy airports usually have multiple FBOs, while smaller ones may have only one or none. The primary FBOs at an airport commonly offer many of these facilities and services; specialized FBOs may supply just one. Also, at many airports, the airport operator provides some or all of the hangar facilities and fueling services. FBOs often develop and own their facilities on land leased from the airport, but in many cases both the facilities and the land are leased. Sites for primary FBOs should be situated where they are easily visible and accessible both from the airport's airside and from adjacent roads. Specialty FBO sites can be in more isolated locations, although vehicle access without the need to go through a security gate is desirable.

Examples of FBO Facilities and Services

- Aircraft rental and charter
- Flight instruction
- Flight preparation room, pilots' lounge, and rest rooms
- Pilots' supplies
- Aircraft and avionics maintenance and repair
- Aircraft fueling
- Based aircraft hangar and tiedown space rental
- Transient aircraft parking

Facilities and services provided by the FBOs at Yuba County Airport are listed in Chapter 1, Table 1B

As noted in Chapter 1, Yuba County Airport has one primary and several specialty fixed base operators. Enhancement of FBO facilities and services is one of the key needs of the airport. Plans for long-term development of the airport's core area should allow for expansion of the existing primary FBO as well as establishment of a second primary and additional specialty FBOs.

Although not an FBO in the sense of providing aviation services to aircraft owners and pilots, another aviation-related tenant of the airport is REACH Air Medical Services. Opened in 2006, the REACH Air Medical Services helicopter operations base consists of a crew quarters building housed in a prefabricated structure, two helicopter parking positions, and several auto parking spaces. The base is situated on the old airline ramp adjacent to Taxiway B just east of Taxiway A. Recognizing that this facility base does not

need to be situated at such a central site on the airport, the current location is regarded as temporary. The aeromedical operations could readily be relocated to a part of the airport slated for development or redevelopment once the necessary infrastructure is in place elsewhere.

Other Support Facilities

- **Aircraft Fueling Facilities**—The primary FBO operates the only fueling services at the airport. Fuel is stored in above-ground tanks and dispensed by truck. As airport activity increases, a site for additional or larger tanks will be needed. Service, especially for turbine-powered aircraft, would continue to be by truck. In addition, the ability for small aircraft to be able to obtain fuel at self-service pumps with 24-hour, credit-card-type access is desirable.

- **Aircraft Wash Rack**—Construction of a state-of-the-art pollution control facility (e.g., wash rack) was completed in late 2006. The pollution control facility is designed to meet current state and local standards to control pollutants from aircraft washing. Prior to its construction, aircraft were washed on the apron wherever it was convenient. The new facility is located immediately east of the six-unit executive hangar building.

- **Air Traffic Control Tower**—The existing air traffic control tower was constructed in 1974 and operated until 1981 when the FAA decommissioned many towers across the country. Currently, the tower is used only during the annual air show. The projected activity levels indicated in Chapter 2 are below the volumes at which reestablishment of air traffic control at the airport is warranted. Absent a much higher activity level or commencement of airline service—neither of which is considered likely—reopening of the tower is not expected to occur during the time frame of this *Master Plan*. Nevertheless, the structure is in good condition and it should continue to be maintained for air show use.

- **Airport Fire Station**—Fire protection at the airport is provided by the Olivehurst Fire Department. The department's present station is on 9th Avenue, about one mile east of the airport. Replacement of the existing station at a new location is under consideration. The proposed new site is on airport property at the southwest corner of Arboga Road and 11th Avenue. From this location, fire equipment would have direct access to the airfield.

Safety and Security

Fencing and Gates

The principal form of security at most general aviation airports is perimeter fencing and controlled-access gates. For security purposes, and for safety as well, fencing should keep unauthorized individuals and, especially, vehicles from accessing the aircraft operating areas of the airfield and building area. Entry should be possible only with an access code, card, or remote control or by passing through a monitored area such as the airport administration building or a fixed based operations facility. Determining appropriate locations for fencing and gates in an airport building area can be complex in that public access to certain facilities needs to be maintained.

In May of 2004, the Transportation Security Administration, in conjunction with a wide group of general aviation industry representatives, developed and disseminated a series of security recommendations for consideration by general aviation airport operators, tenants, and users entitled "Security Guidelines for General Aviation Airports" (IP A-001). These recommendations, while not regulatory, should be carefully considered for application at Yuba County Airport.

Fencing at Yuba County Airport exists around most of the airfield, but is incomplete within the building area. A fencing project completed in 2006 remedied some of the deficiencies, primarily in the vicinity of the new aircraft wash rack and adjacent to the REACH aeromedical helicopter base. A new automatic gate for vehicle was installed along the access road near the wash rack. A near-term future fencing project will secure the area around the executive hangars situated along Taxiway B and near the agricultural applicator facility on the west side of the airport. Additional future fencing will be needed in conjunction with development of the southern portion of the airport core area.

FAR Part 139

Safety and security requirements for airports that offer scheduled airline service are far more elaborate than at airports that only have general aviation. As discussed in Chapter 2, airline service is not expected to be established at Yuba County Airport, in part because of the cost of meeting the associated safety and security requirements. The following paragraphs outline what these requirements would be.

Since 1970, the FAA has had the statutory authority to issue airport operating certificates to airports served by commercial air carriers. Currently, airports serving air carrier aircraft with more than 30

seats must have an operating certificate issued by the FAA. Requirements for obtaining and maintaining the certificate are contained in Federal Aviation Regulations Part 139, *Certification and Operations: Land Airports Serving Certain Air Carriers.*

The purpose of the certification process is to ensure that commercial passenger service airports meet certain safety standards. These standards include requirements for airport design, construction, maintenance, operations, fire fighting and rescue equipment, runway and taxiway guidance signs, control of vehicles, management of wildlife hazards, and record keeping.

In February of 2004, the FAA issued new Part 139 certification standards that extend the requirements of Part 139 to include airports accommodating air carrier aircraft with more than 10 seats. Yuba County Airport does not have a Part 139 operating certificate. The former Hughes Airwest service ended before the promulgation of Part 139. The former Eureka Aero service operated with aircraft with less than 30 seats, so a certificate was not required. To obtain a Part 139 operating certificate, significant upgrades would have to be made to the airport. These upgrades would include:

- Perimeter fencing and access controls.
- Runway and taxiway guidance sign system.
- Evaluation of all operational surfaces to determine the extent of modifications required to meet Part 139 requirements.
- Preparation of Airport Operations and Emergency Manuals.
- Acquisition of aircraft fire fighting and rescue equipment.
- Construction of an aircraft fire fighting and rescue equipment building.
- Construction of a passenger terminal building.
- Addition of qualified airport operations and fire fighting personnel.

Prior to November 2001, commercial service airport security was regulated by the FAA's Civil Aviation Security Division. Federal Aviation Regulations Part 107 established security requirements. The Aviation and Transportation Security Act of 2001 established the Transportation Security Administration (TSA) which now oversees security at commercial service airports. In order to accommodate commercial passenger operations at Yuba County Airport, the County would have to construct passenger terminal facilities meeting TSA requirements for passenger and baggage screening, hold areas, and administrative areas.

A detailed estimate of costs to upgrade the airport to Part 139 and TSA standards is beyond the scope of this *Master Plan.* If a

potential commercial passenger airline were to approach the County with the thought of establishing scheduled service, the County should not enter negotiations without first assessing the costs of meeting federal requirements. A Part 139 inspection should be performed by a qualified inspector and an architectural firm familiar with TSA requirements should be consulted.

Industrial Development

As a means of generating additional revenues to help support aviation-related activities, many general aviation airports have turned to selling or leasing some of their land for nonaviation, commercial or industrial development. Only those lands deemed excess to long-term aviation needs should be considered for use in this manner. This is a requirement when the FAA has participated in the acquisition of the property or the airport was a former U.S. military facility. The FAA must formally "release" the property to enable it to be used for nonaviation purposes and the locations must be indicated on airport plan drawings.

Since as early as the mid 1950s, Yuba County has acted to enable extensive portions of the airport property to be developed for nonaviation uses. The FAA has released approximately 264 acres, some in each of the airport's four quadrants. Of this, the County has sold 155 acres and leases 34 acres for nonaviation purposes as of early 2008. Excluding roads, the remainder is available for future sale or lease. All revenues from both the sale and lease of property accrue to the airport enterprise fund.

The prior FAA releases covered only the property that was subsequently sold or leased for private industrial development. Research and surveys of the airport property boundary conducted during the master plan study revealed that adjacent rights-of-way that remained county property were not formally released. These locations include the Arboga Road frontage, Skyway Drive, and the drainage channel along the west side of the airport. The FAA regards these rights-of-way as non-airport because they do not exclusively serve airport facilities. Release of property to enable extension of Skyway Drive is also necessary. These releases, totaling approximately 55 acres, are pending with the FAA.

Several parts of the airport currently designated for nonaviation uses remain undeveloped. Other undeveloped areas also may be better suited to nonaviation development than to aviation-related use. Oppositely, certain locations now planned or perhaps even in use for nonaviation purposes might be better devoted to aviation functions. The suitability of various blocks of the airport building area for aviation versus nonaviation uses is examined later in this chapter.

Summary of Land Requirements

Building area lands already devoted to or identified for aviation-related and associated support uses occupy close to 30 acres. Within this area is parking for approximately 170 aircraft, including hangar spaces as well as based and transient tiedown spots. This usage equates to about 5.7 aircraft spaces per acre. A more typical density for airports similar to Yuba County Airport is closer to 8.0 spaces per acre. The low density at Yuba County is reflective of both the extensive amount of undeveloped land within the building area and the relatively inefficient layout or underutilization of the developed portions.

If the entire 30 acres could be fully utilized in a more efficient manner, then some 240 aircraft spaces theoretically could be provided. More realistically, the capacity is probably somewhat less than this amount. Even so, the 30 available acres should be capable of accommodating most of the projected 20-year demand for 150 based and 25 transient aircraft spaces.

Looking beyond 20 years (or sooner if Sutter County Airport were to close) as well as at the siting requirements of various building area functions and the relationships among them, then additional land clearly will be needed. In planning for the ultimate development of Yuba County Airport, it is not unreasonable to consider a demand for over 400 based and transient aircraft spaces. Using the typical density noted above, this means that at least 50 acres should be reserved for aviation-related development. Remaining lands can then be allocated to possible special aviation-related uses that would require large blocks of land, made available for nonaviation development, and/or preserved for air show needs.

DESIGN FACTORS

Many factors must be considered in planning for future development of the Yuba County Airport building area. Some of these factors are specific to airports. Others, though, are similar to ones that affect any long-term development planning decisions.

Existing Property and Facilities

- **Airport Property**—The current (after pending FAA release) airport property consists of approximately 605 acres. The existing runway and taxiway system occupies about 370 acres of this total. This leaves some 235 acres as existing or potentially available building area. Only about 31 acres, all within the core southeast quadrant, are presently developed with aviation-related facilities (not counting the 4 acres of privately owned

land used or planned for executive hangars). Within the southeast quadrant alone, 29 acres in the southern portion of the area are vacant and available for aviation-related uses. Additionally, 21 acres are under short-term leases or agreements (to American Composite, the Public Works Department for the county road yard, and the Sheriff's Department for a firing range) and could revert to aviation-related use. The 50 acres available for aviation-related uses in the southeast quadrant is more than adequate to meet likely demands even beyond the 20-year master planning time horizon. Unless a demand should arise for a large facility that could not be accommodated in the southeast quadrant, a need for aviation-related development in the other three quadrants is not apparent. Nevertheless, these areas should continue to be preserved for aviation-related use.

- **Leaseholds**—Within the southeastern quadrant core area of the airport, most existing leases, both aviation-related and non-aviation, are short term or even month-to-month in duration. The existing lease boundaries thus are not considered to represent significant constraints upon future development. However, the financial implications of removing existing revenue-producing uses must be taken into account in planning decisions.

- **Existing Facilities**—Essentially all of the airport's aviation-related buildings and facilities are located in the southeastern quadrant of the airfield. The age and physical condition of these structures and other facilities varies. The six-bay executive hangar and the hangars along Taxiway B are the newest airport buildings and will remain in place throughout the 20-year time frame of the *Master Plan*. Other buildings likely to continue in existence for 20+ years include the control tower and all T-hangars. The future of FBO buildings, the restaurant, and the airport offices is considered more uncertain. With the certain exception of one dilapidated hangar building, all these structures are reasonably sound and could continue in use. However, because major upgrading will be necessary to meet future demands, cost and site planning considerations may dictate that these facilities be removed and then replaced by new structures.

- **Airfield Setback Distances**—A uniquely aviation-related design factor is the requirement that buildings, aircraft parking, and other building area development be set back a safe distance from the airport runways and taxiways. These setbacks therefore form the interior boundary of the airport building area. As discussed in the preceding chapter, the following design criteria are recommended:

- A minimum of 750 feet from the centerline of Runway 14-32 to any future buildings.
- A minimum of 250 feet from the centerline of Runway 5-23 to any future buildings.
- A minimum of 93 feet from Taxiway A centerline to parked aircraft or other obstacles.
- A minimum of 66 feet from Taxiway B centerline to parked aircraft or other obstacles.
- No buildings within runway protection zones (although certain low-intensity uses may be acceptable on the RPZ edges).

- **TVOR Restricted Area**—Under terms of the lease with the FAA, restrictions apply to the area within 1,200 feet of the Terminal VOR antenna situated northwest of the runway intersection. No structures are permitted within 750 feet of the antenna and, in the remaining area, the height and construction type is restricted.

Accessibility and Infrastructure

- **Airfield Accessibility**—For aviation-related development, an important design consideration is whether a particular site has aircraft access to the airfield. With Taxiways A and B running along two of its edges, most of the southeastern quadrant of the airport has good airfield access. The southeasternmost corner of this quadrant has no existing airfield access, however, and access to some of the interior portions of this quadrant is restricted by existing development. The northeast and southwest quadrants have more limited taxiway connections and no taxiways serve the northwest corner of the airport.

- **Road Accessibility**—Although most of the existing and potential uses of the airport building area generate only low volumes of traffic, good access to the surrounding road network is essential. Facilities used by the general public especially need convenient road access. The present accessibility of each of the airport's four quadrants differs significantly.
  - *Southeast Quadrant:* Arboga Road along the eastern edge and Sky Harbor Drive extending into the interior of the southeast quadrant provide good road accessibility for most of this area. The County's intent is to limit the number of access points along Arboga Road. Additional internal roadways thus will be needed to serve future development in this area.
  - *Southwest Quadrant:* Skyway Drive provides adequate although rather round-about access to the industrial uses in this quadrant.

- *Northeast and Northwest Quadrants:* No roads currently serve these two corners of the airport. The railroad spur bordering these areas is the primary impediment to road access. Potential access points into these two areas that do not require crossing the rail line are limited.

- **Utilities**—Water, power, and telephone services are the most essential utilities for general aviation functions. Sewer service is desirable and, for many industrial uses, essential. All of these utilities are available on or along the perimeter of the airport, although extensions into some interior portions of the building area will be necessary to support future development. The northeast and northwest quadrants have the most limited utility lines at present.

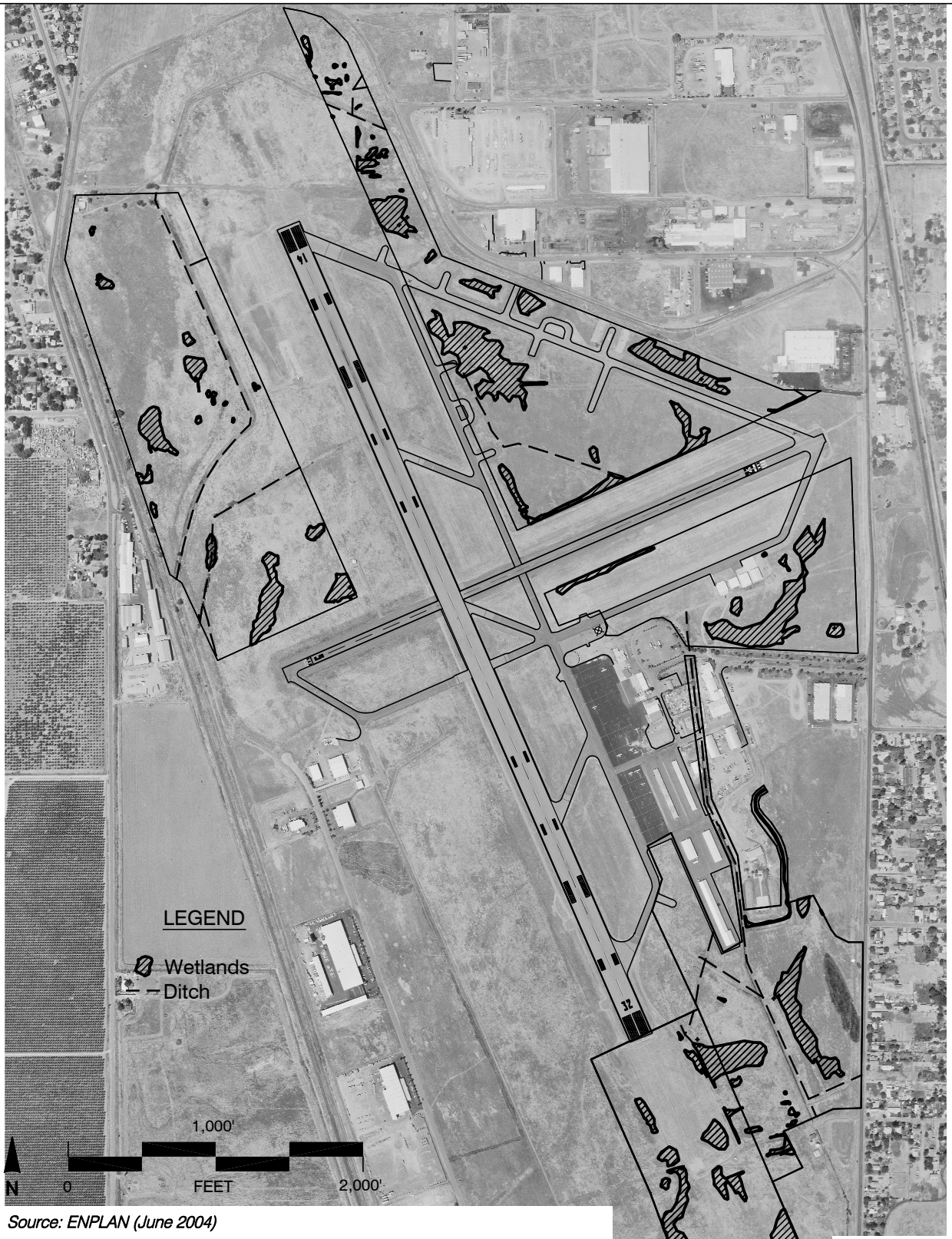
Environmental Constraints

- **Terrain**—Terrain is not a significant factor at Yuba County Airport. Slopes throughout the airport are minimal.

- **Drainage**—The flatness of the site contributes to drainage problems in various areas of the airport. Some locations are prone to minor flooding. A complete drainage study of the airport is scheduled to be completed prior to the adoption of this *Master Plan*. Initial findings of the drainage study indicate that one or more detention basins will need to be constructed on the airport in order to reduce the flooding potential which will worsen as additional areas are developed.

- **Wetlands**—The presence of wetlands can be serious constraints to development on airports or elsewhere. A study—documented in *Yuba County Airport Wetland Pre-jurisdictional Delineation Report* (Enplan, July 2004)—to identify biological features of the airport property was conducted in conjunction with this *Master Plan*. The field work took place primarily during April 2004. A total of some 32.4 acres of wetlands subject to U.S. Army Corps of Engineers jurisdiction were identified within the study area (Figure 4A). Portions of the airport where no development is planned—primarily infield areas between the runways and taxiways—were not included in the study areas. Six types of wetlands were found: constructed ditches and drainage swales; vernal pools; vernal swales; wet swales; wet meadows; and riparian scrub wetlands. Wet meadows constitute the majority of the wetlands, some 20.9 acres.

  Delineation of wetlands on the airport was challenging. The *Delineation Report* notes that the boundaries between wetlands and uplands on the site are very indistinct due partly to the flatness of the terrain.



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Source: ENPLAN (June 2004)

Figure 4A

Potential Wetlands

Yuba County Airport

Also, the natural hydrology of the site has been greatly altered by construction of the airport and the network of ditches and swales traversing it. Natural vegetation associations have been altered by annual irrigation, burning, and mowing. Ultimately, the Corps of Engineers verification of the delineation will become the basis for decisions as to what type and how much mitigation will be required for any unavoidable wetland impacts associated with airport development.

- **Biological Factors**—A biological screening of the airport was conducted in the Fall of 2003 and updated by observations made during the wetlands delineation (Enplan, July 2004). Two federally listed rare or endangered species potentially reside on the airport property. One is the valley elderberry longhorn beetle. This threatened species depends upon elderberry plants for feeding and reproduction. Several elderberry shrubs are found in the airport's northwestern quadrant. Secondly, the airport has some habitat potentially suitable for the Swainson's hawk, federally listed as a species of concern. An active raptor nest was spotted in the northwestern part of the airport in the Spring of 2004, but the specific species was not identified. Regardless of species, nesting raptors are protected under the Migratory Bird Treaty Act. Consequently, a field survey should be conducted of all suitable raptor nesting habitats on the airport prior to any construction in those locations.

Financial Factors

- **Development Costs**—Whatever development occurs within the airport building area must be financially sound. The relative cost of one development alternative versus another clearly is a major factor in the planning process. Cost calculations must consider not just construction costs, but also the revenues that would be lost—even if only temporarily—if new development eliminates existing revenue-producing uses.
- **Development Increments**—One means to help ensure financially sound development is to avoid constructing facilities too far in advance of the demand. As noted in Chapter 2, the growth in numbers of based and transient aircraft at Yuba County Airport is expected to be moderate over the 20-year time horizon of the *Master Plan*. The growth rate for the principal measure of demand—the size of the airport's based aircraft fleet—is expected to average 2.0% per year. The reality, though, is that increases in the fleet size are more likely to occur in larger increments than the two or three per year that this average growth rate would suggest. For example, at present an existing unmet demand for at least 10 to 20 additional hangar

units appears to exist. One new hangar building thus might represent some five years growth.

- **Development Staging**—The challenges to staging of development over an extended time period are twofold. One challenge is to minimize costly "phase one" construction that may not be fully utilized for many years. Balanced against this objective is the need to ensure that early development is not located in a manner that, while perhaps less expensive initially, hinders later phases of development. The goal is to have a plan that is flexible enough to adapt to changes in type and pace of facility demands, is cost-effective, and also is functional at each stage of development.

DEVELOPMENT ALTERNATIVES

Building Area Development Suitability

Numerous alternatives can be defined that will meet the various building area facility requirements listed earlier in this chapter. The preceding design factors narrow this range of alternatives, but many possibilities still remain. The purpose of the analysis that follows is to give some structure to the myriad of possibilities. Rather than attempting to identify a precise plan for development, the intent here is to establish a framework within which individual facility requirements can be accommodated over the lifespan of the *Master Plan*.

Yuba County Airport has the advantage of having over 200 acres of land potentially usable for building area development with less than 20% of it built upon. Not all of this land is equal, however. To help assess which areas are best suited for what functions, Figure 4B divides the building area into 11 blocks of land each having relatively uniform physical characteristics. Table 4A lists the apparent development opportunities for each block together with the constraints and other design factors affecting the realization of those opportunities.

A review of Table 4A reveals that none of the land blocks is best for all things. Each offers development opportunities, but each also has significant constraints. Conclusions reached regarding the optimum usage of each block—both near term and by the end of the 20-year master planning time frame—are as follows:

- **Block A (Existing core area aviation facilities)**—With excellent road and taxiway access, this location will continue to be the airport's core area. Its function in this regard needs to be enhanced. The existing T-hangars and new executive hangars

are assumed to remain throughout the planning period. The FBO maintenance hangars and other buildings and the presently closed restaurant could be remodeled and upgraded or removed and replaced depending upon detailed site planning studies and the desires of existing and potential tenants. The little-used auto parking lot also potentially could be partially used as a building site. Reconfiguration of the northern end of the apron area is needed to better accommodate business jets and other large aircraft that would be attracted to enhanced facilities.

- **Block B (Core area nonaviation facilities)**—Over time, this area should be converted to aviation-related uses. It represents a prime site at the front entrance to the airport and can readily be accessed with new road and taxilane extensions. The barrier created by the existing drainage ditch along with the need to remove existing facilities and clean up the site, however, are major impediments to near-term redevelopment of most of the site. The portion having the best potential for near-term reuse is the southern end now occupied by the Sheriff's firing range. This facility should be relocated as soon as practical. The site would then be well-suited for construction of additional T-hangars. The northern end of Block B should primarily be reserved for eventual FBO expansion, airport offices, and other facilities requiring public access.

- **Block C (Vacant land south of core area)**—Consisting of some 29 acres of vacant land, Block C is probably the best site available for construction of large corporate hangars when the demand arises for such structures. Although it does not currently have taxiway access, Taxiway A could be extended to serve the area (and the proposed runway extension as well). Depending upon how quickly Block B becomes available for aviation-related uses, only part of Block C likely will be needed for hangars. With FAA approval, a portion potentially can be designated for nonaviation development. Some of the area also is likely to be needed for a stormwater detention basin. Any development will need to take into account the wetlands present on the site.

- **Block D (Corporate hangar sites)**—Unless the County should decide to reacquire some of the undeveloped parcels that have been sold for hangar development, the future usage of this block is set. Extension of Taxiway B and an access road will be needed to serve the parcels closest to Arboga Road. This latter area contains some wetlands.

Block	Location	Opportunities	Constraints
A	***Existing core area aviation facilities*** *(31 acres)*	› Enhance facilities for based aircraft pilots and visitors › Potential site redevelopment with removal of older buildings	› Established long-term leases › Limited vacant land
B	***Core area nonaviation facilities*** *(21 acres)*	› Location well-suited to extension of core aviation area (Block A) › Good road accessibility › Utilities already provided to site	› Existing leases, although generally short term, would need to be terminated › Existing leases provide continuing revenue to airport › Conversion of site to aviation uses would require removal of existing structures › Unknown site clean-up needs (hazmat) › Taxilane access requires crossing major drainage ditch
C	***Vacant land south of core area*** *(29 acres)*	› Potential extension of existing core area › Good airfield access if Taxiway A extended › Area accessible from Arboga Road	› No existing utilities in interior of site › Probable wetlands in a portion of area
D	***Corporate hangar sites*** *(4 acres)*	› All sites sold, but 9 remain vacant › Good airfield access if taxiway extended	› Land is no longer airport property › Potential wetlands at eastern end of area
E	***Vacant land north of Sky Harbor Dr.*** *(11 acres)*	› High-visibility site at main airport entrance › Suitable for nonaviation development › Released by FAA as excess to aviation needs › Potentially accessible for aviation use	› Taxiway access constrained by corporate hangar sites (Block D) › Likely wetlands on much of site
F	***Eastern segment of Taxiway B*** *(17 acres)*	› Taxiway set farther from Runway 5-23 than required by FAA standards › Relocation of taxiway could provide additional land for core area development	› Cost of taxiway relocation › Layout of area constrained by need to maintain taxiway access to corporate hangar sites › Difficult to provide road access unless inside fence › Building heights limited on portion closest to runway
G	***Northeast quadrant*** *(72 acres)*	› Large site with good airfield access › Little existing development on site	› Road access limited by adjacent development and railroad spur › No existing utilities in interior of site › Possible requirement for clear area around remote transmitter-receiver affects portion of site › Area separated from core aviation area by Runway 5-23 › Development would eliminate use of area for overflow aircraft parking during air shows › Probable wetlands in several locations
H	***Northwest quadrant industrial tract*** *(37 acres)*	› Large site, mostly vacant land › 31 acres released by FAA; release of remaining area pending › Potential airfield access with additional taxiway › Could have rail access	› Road access requires crossing railroad spur › No utilities to interior of site › Uses limited by location within approach zone for possible parallel runway
I	***Northwest quadrant remainder*** *(37 acres)*	› Large, undeveloped site › Potential airfield access with additional taxiway	› Remote from core area of airport › Road access requires crossing rail line › No utilities to interior of site › Uses limited by proximity to existing runways and location with approach zone for possible parallel runway
J	***Land reserved for possible parallel runway*** *(51 acres)*	› Could continue to reserve area for possible parallel runway › Good airfield access if taxiway extended › Possible use for expansion of adjacent industrial sites	› Long, narrow shape limits layout options › Heights constrained by proximity to Runway 14-32 › Road access blocked by adjacent industrial sites
K	***Runway 5-23*** *(39 acres)*	› Could keep in use as crosswind runway › Runway closure would enable connecting northeast quadrant land (G) with core aviation area (A)	› Although need is limited, Runway 5-23 is useful during occasional strong crosswinds and when primary runway is closed for maintenance

Table 4A

Building Area Development Suitability

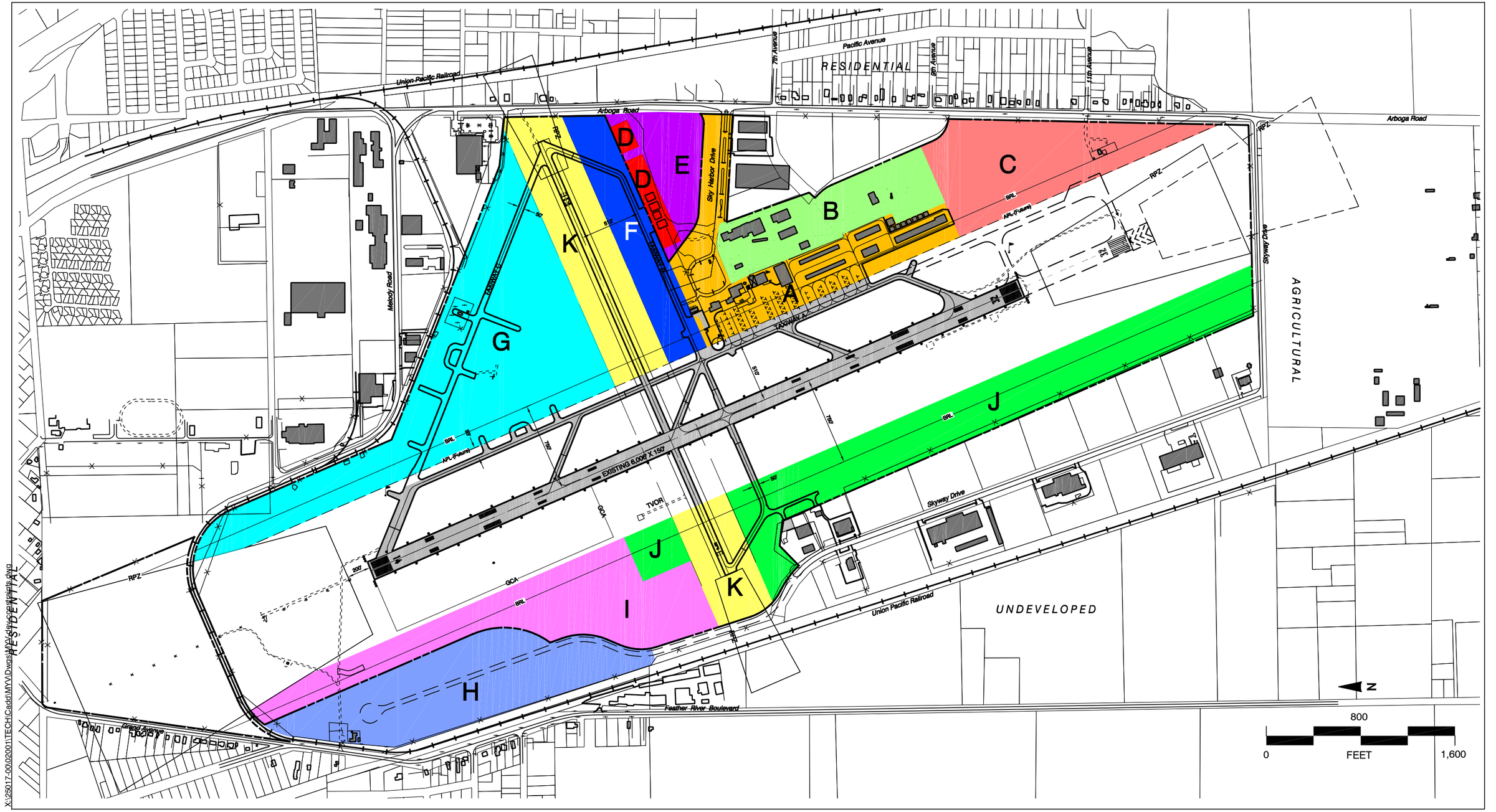

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Figure 4B

Building Area Land Blocks

Yuba County Airport

- **Block E (Vacant land north of Sky Harbor Drive)**—Block E has to date been reserved for possible aviation-related development although the FAA has already released the land as excess to aviation needs. Taxilane access would be provided through one of the 80-foot-wide parcels in Block D that has been retained by the County. The site's constrained airfield accessibility together with its prime location at the main entrance to the airport, however, make it much better suited to nonaviation development. Offices or other attractive, high-quality buildings would be ideal. A large portion of the site contains wetlands and avoidance of these areas can more likely be achieved with offices than other types of land uses.

- **Block F (Eastern segment of Taxiway B)**—As discussed in Chapter 3, Taxiway B is situated much farther from Runway 5-23 than FAA design standards require. Conceptually, relocation of the taxiway northward would open additional land to building area development. An examination of this prospect, however, reveals that much of the land gained would not be easily usable because of the need to maintain airfield accessibility for the existing and future hangars in Block D. Relocation of the taxiway would be more of a benefit to Block A. Given the more readily usable lands available in Block C and perhaps in Block B, conversion of Block F appears to be unnecessary for the foreseeable future. This option could be reconsidered at a later date once other lands on the airport are more fully developed.

- **Block G (Northeast quadrant)**—At least through the near term, Block G is probably best reserved for temporary use during the annual air show. However, consideration should be given now to establishing an access corridor from Melody Road through the industrial park that borders this area's north side. Unless the existing railroad spur is removed, this access will require approval for crossing the tracks. Short of closure of Runway 5-23, the only access routes that do not involve crossing the rail line are from Arboga Road through the Runway 23 RPZ or circuitously from Skyway Drive around the approach ends of Runways 5 and 14. The needs for use of this area for more permanent aviation-related development should continue to be evaluated. Ultimately, this site may be best suited for industrial development subject to FAA approval. For land use compatibility purposes, height restrictions and usage intensity limits also must be considered. Wetlands exist in portions of the site.

- **Block H (Northwest quadrant industrial tract)**—Undeveloped except for the animal control facility in the northeast corner, this area has been released from obligations to the FAA

and currently is planned for sale or lease as an industrial park. No taxiways serve this corner of the airport, so it is not well suited for aviation-related development. Road access issues will need to be resolved and restrictions for reasons of land use compatibility with the nearby runways will need to be applied. Some wetlands are present.

- **Block I (Northwest quadrant remainder)**—This block lies adjacent to Block H, but closer to the two existing runways and also would be partially within the approach of a future parallel runway. Compatibility restrictions would therefore be greater. Also, unlike Block H, Block I has not been released for nonaviation development. Use of the area is further restrained by its proximity to the TVOR. Once Block H has been mostly developed, consideration could be given to making appropriate parts of Block I available for low buildings and/or auto parking.

- **Block J (Land reserved for possible parallel runway)**—As concluded in Chapter 3, a parallel runway does not appear to be needed within the 20-year time frame of the *Master Plan*. An assessment was therefore made to determine whether the land might be used for building area functions instead. The conclusion reached is that the existing industrial parcels to the west and required setbacks from Runway 14-32 to the east combine to make the area essentially unusable for non-airfield purposes. It should continue to be preserved for eventual construction of a parallel runway.

- **Block K (Runway 5-23)**—Runway 5-23 adds little to the overall capacity or utility of the airfield (a parallel runway would add far more). If a strong need for the land could be identified, its closure would be reasonable. However, with extensive developable acreage available elsewhere, no such need is apparent within the foreseeable future. Block K is therefore assumed to remain part of the runway/taxiway system throughout the time horizon of the present plan.

Recommended Development Framework

A key conclusion that can be gleaned from the preceding analysis is that essentially all of the reasonably foreseeable aviation-related development needs over the next 20+ years can be met within the airport's southeast quadrant. The difficultly lies in the fact that little of the land in this area is ready for immediate development. Additional internal access roads, primary taxilanes, and major drainage and utilities lines need to be constructed. Once the locations of these facilities has been determined, lease boundaries can be established, hangars and other facilities can be constructed, and other development actions can proceed as the demand warrants. The

following discussion highlights recommended features of this development framework.

Key Features

- **Primary Access Roads**—Sky Harbor Drive is well-located to continue to serve as the airport's main entrance road. The existing road that extends southward from there to the County Road Yard should be upgraded and extended to serve future development at the site of the present firing range. A further recommendation is that this road extend to a secondary airport entrance at Arboga Road and 11th Avenue. This internal road would serve as a divider between aviation and nonaviation uses.

- **Other Internal Roads**—Two other internal access roads are also recommended for the southeast core area. One, following essentially the present dirt road alignment, would serve the executive hangar area adjacent to Taxiway B. This road also could provide a back entrance to future industrial development in Block E north of Sky Harbor Drive. The other recommended new road would extend from the primary internal access road to a cul-de-sac near Taxiway A. This road would serve future corporate hangar development in this area.

- **Central Auto Parking Lot**—A longer-range recommendation is that the central airport parking lot be shifted southward from its present position. This change would make the present parking lot available for FBO facilities development with access from Taxiway B (the assumption here being that Taxiway B will remain in its present position and that Runway 5-23 will remain operational throughout the 20-year planning period). It also would put the parking lot in a more central position relative to other future facilities requiring public access and parking. Major redevelopment of this area of the airport—including elimination of existing industrial buildings and the airport administration building—is necessary for implementation of this layout.

- **Primary Taxilanes**—The arrangement of existing T-hangar buildings effectively locks in the alignment of taxilanes needed to serve future aircraft storage areas in Block B. An additional taxilane connecting with the future southward extension of Taxiway A will be necessary to serve future corporate hangar sites in Block C.

- **Drainage**—The existing drainage ditch crossing through building area is an impediment to expansion of aviation-related facilities into Blocks B and C. This drainage course should be moved to an alignment following the proposed new access road. Aesthetically, it would be preferable for the drainage to

be undergrounded. However, in the suggested alignment, an open ditch could also be workable although the area available for hangars and other development would be reduced. To reduce the size of the pipe and/or channel, areas for detention of stormwater are needed. A detention basin in the southeast corner of the airport (adjacent to Arboga Road and Skyway Drive) could serve this purpose.

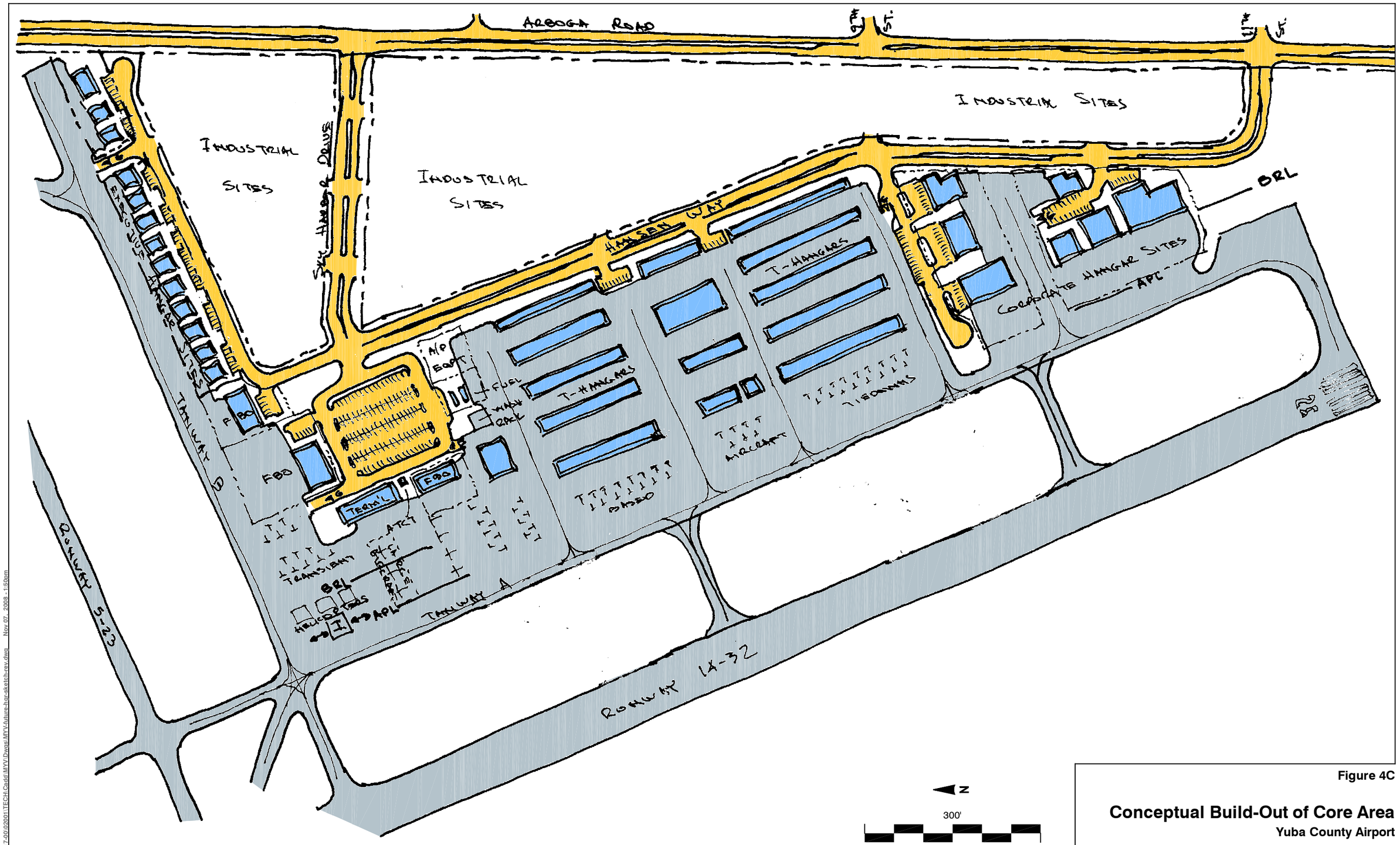
- **Utilities**—The right-of-way for the proposed access road also would serve as a logical alignment for the primary utility lines serving internal areas of the southeast quadrant. Lines serving individual buildings can be extended from there.

Ultimate Build-Out

Figure 4C illustrates how Yuba County Airport's southeastern quadrant might look at full build-out. The various roads and taxilanes recommended above are shown. The locations and sizes of individual buildings, however, are shown merely to depict some possibilities—they do not represent a proposed development plan.

The layout concept as illustrated concentrates future primary FBO facilities and a new terminal building around a new central parking lot at the end of Sky Harbor Drive. Transient aircraft parking along with a helicopter landing pad and parking also would be in this area. Specialty FBOs and individual storage hangars would continue along Taxiway B on the sites already established. T-hangars would be concentrated in the central part of the quadrant, east of the existing hangars. A new corporate hangar area would be established at the south end of the area. The total based aircraft parking capacity of the facilities shown is approximately 250. As discussed in Chapter 2, this number equals the 20-year demand projected for the airport including contingency planning for possible closure of Sutter County Airport.

Lands along Arboga Road would continue to be made available for nonaviation development and several additional small plots would be created. All sites would be accessed from internal roads rather than from Arboga Road. The latter is shown with future widening to four lanes.



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300'

0 FEET 600'

Figure 4C

Conceptual Build-Out of Core Area

Yuba County Airport

5

Environmental and Financial Issues

5

Environmental and Financial Issues

ENVIRONMENTAL ISSUES

Environmental Impacts

Only a limited evaluation of environmental factors has been conducted as part of this master plan study. The focus has been on a wetlands and biological resources reconnaissance as summarized in Chapter 4. A comprehensive assessment of the environmental impacts associated with implementation of the *Master Plan* will be required in accordance with California Environmental Quality Act (CEQA) guidelines prior to when the plan is formally adopted by the Yuba County Board of Supervisors. Modifications to this draft plan may result from that analysis.

Airport Land Use Compatibility Planning

California state law (Public Utilities Code Section 21670 et seq.) requires local preparation of airport land use compatibility plans for essentially all public-use and military airports in the state. In Yuba County, this responsibility rests with the Sacramento Council of Governments which functions as the Airport Land Use Commission (ALUC) for Sacramento, Sutter, Yolo, and Yuba counties. The ALUC last updated the compatibility plan (or "comprehensive land use plan") for Yuba County Airport in May 1994. The ALUC uses the compatibility plan to fulfill a second responsibility: the review of certain land use development proposals in the vicinity of the airport for compliance with the plan's policies. The ALUC has no authority over existing land uses.

Criteria established in the compatibility plan address noise, safety, and airspace protection compatibility issues. For each of these compatibility concerns, the plan includes a set of criteria and a map

identifying the portions of the airport environs in which the criteria apply. The criteria are only minimally restrictive. For example, new residential development is permitted anywhere outside the 65-dB Community Noise Equivalent Level (CNEL) contour and the runway protection zones. With minor exceptions, existing land uses appear to be consistent with the present compatibility criteria.

Prior to adoption of the present *Airport Master Plan*, the draft plan must be submitted to the ALUC for review as to whether it is consistent with the ALUC's plan. Certain recommendations of the *Master Plan* differ from the assumptions of the compatibility plan. In particular, the latter plan is based upon an airfield configuration that includes future extension of the primary runway to 7,300 feet and construction of a 3,750-foot parallel runway, as well as continuation of the existing 3,281-foot crosswind runway. The present recommendation calls for a 7,000-foot primary runway and omits the parallel runway. When the present *Master Plan* document is submitted to the ALUC for review, the county will request that the compatibility plan be modified to reflect the currently proposed airfield configuration. Also, the noise contours should be updated to correspond to the latest activity forecasts.

Beyond these basic updates, a strengthening of the compatibility criteria is recommended. Applicable guidelines set forth in the 2002 edition of the California Division of Aeronautics *California Airport Land Use Planning Handbook*, required to be used as the basis for compatibility plans, suggest that new residential development should be precluded within the 60-dB CNEL contour and held to very-low densities within an expanded area of safety compatibility concern. Even absent ALUC adoption of more stringent compatibility criteria for Yuba County Airport, Yuba County and the City of Marysville are strongly encouraged to establish and implement such policies on their own. Given the increasingly rapid development occurring in the vicinity, strong land use compatibility policies are essential to the long-term viability of the airport as a major community asset.

FINANCIAL ISSUES

Funding Sources

The primary source of funding for most of the capital improvements recommended in this master plan is the Federal Aviation Administration. Limited funding is also available through the California Aviation Program. County of Yuba and/or private funding also will be required on all projects. Specific funding programs for airport improvement projects include the following.

Federal AIP Grants

Federal grants are currently available through the FAA's Airport Improvement Program (AIP). The current grant program was authorized under legislation, the Vision 100 – Century of Aviation Reauthorization Act, which was signed into law on December 13, 2003. It provided funding for fiscal years 2004 through 2007, ending in September 2007. As of April 2008, Congress is continuing to debate new multi-year legislation. Meanwhile, the previous program has been temporarily extended to cover part of fiscal year 2008.

AIP provides both entitlement funds and discretionary funds. Under Vision 100 as extended, the entitlement amount for general aviation airports was $150,000 per year through fiscal year 2007 with a partial amount allocated to date for fiscal year 2008. These entitlement funds can be used each year that they become available or they can be delayed and used in the third year for a larger project. The AIP program also allows for discretionary funding to be made available from the FAA to provide financial support for capacity and safety-related projects, as well as projects intended to keep the critical components of the airfield operational (e.g., runway/taxiway rehabilitation).

Projects that are eligible for FAA AIP funding are determined based on guidelines contained in FAA Order 5100.38, Airport Improvement Handbook. As a general rule, only airport projects that are related to non-revenue producing facilities, such as airfield construction, public areas of a terminal, and land acquisition, have been eligible for federal funding. Vision 100, however, expanded eligibility for use of AIP funds to include hangar construction, albeit at a relatively low priority level. Vision 100 increased the FAA's share of the costs for eligible projects. For general aviation airports in California, the FAA share was 95% through 2007.

The forthcoming legislation is anticipated to contain similar provisions as the 2003 Act with regard to provision of grants for improvements at general aviation airports such as Yuba County Airport. Remaining uncertain is the total amount of funding that will be provided and what percentage of project costs the federal government will cover. The FAA cost share may return to 90%, the amount provided by the AIP prior to 2004.

State of California Aviation Program

The State of California, through the Department of Transportation Division of Aeronautics, offers several programs to financially support general aviation airports in the state.

- **Matching Grants**—Matching grants assist general aviation airports in meeting the local match for federal AIP grants. The state's matching share has varied over time as the federal government has changed its funding share. Currently, the state matching grant amount is 2.5% of the federal share (that is, 2.5% of 90% or 2.25% of the project cost). Eligible projects must benefit general aviation and be in the Capital Improvement Program (CIP) element of the California Aviation System Plan.

- **Acquisition and Development Grants**—These discretionary grant funds are for eligible projects subject to programming and allocation by the California Transportation Commission. 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. Also eligible for funding is the preparation of airport land use compatibility plans by county airport land use commissions. Due to substantial reduced revenue available to the state, the state's overall airport funding program has been significantly impacted; however, funding is still available.

- **State Annual Grant**—General aviation airports are eligible to receive a $10,000 annual grant. These funds can be used for airfield maintenance and construction projects, as well as airfield and land use compatibility planning. Airports can accumulate these funds for up to five years.

- **State Loan Program**—In addition to the above grant programs, the Division of Aeronautics 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, aviation fuel facilities, etc.).

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 program, including; economic development, community development, and rural infrastructure.

Local/Airport Funds

At general aviation airports the size and character of Yuba County Airport, airport sponsor self-funding is principally provided by a combination of airport-generated income and airport owner (municipal) funds. Funding of airport improvements that are not grant eligible and providing the local matching share for grants-in-aid

from these sources is the simplest and often most economical method because direct interest costs are eliminated.

COST ESTIMATES

The proposed 20-year capital improvement program for Yuba County Airport is presented in Table 5A. Proposed improvements described in the preceding two chapters are included in the list together with major pavement maintenance work that will be necessary over the planning time frame. Within the building area, costs are listed only the major "framework" facilities—taxilanes, roads, utilities, etc.—as identified in Chapter 4. Costs for hangar buildings, FBO facilities, and other development that is expected to be privately financed are not included. Also, costs for the terminal area redevelopment as reflected in the conceptual build-out plan (Figure 4C) are very general and will vary depending upon the detailed design of this area as it eventually materializes.

The indicated costs are order-of-magnitude estimates in 2004 dollar values. Design engineering, construction inspection, and other related costs are included for each item and a contingency factor is added as well. The cost estimates are intended only for preliminary planning and programming purposes. Specific project analyses and detailed engineering design will be required at the time of project implementation to provide more refined and up-to-date estimates of the individual project costs.

Projects listed in Table 5A are grouped into three phases of development:

- Short range (within 5 years);
- Mid range (approximately 5 to 10 years); and
- Long range (beyond 10 years).

Figure 5A depicts the location of each of the proposed major improvements and the anticipated time frame of construction. The timing indicated is based upon the forecasts presented in Chapter 2. It is important to emphasize, though, that the general sequence of development indicated in the capital improvement program is more significant than the precise timing. The actual timing of major improvements will be driven by demand, not by the calendar. If the growth rate of projected aviation activity is not realized, then each phase of development would extend over additional years. On the other hand, demands for construction of certain facilities could arise more quickly than the staging plan anticipates.

		Estimated Costs (in 2008 dollars)		
		Total	**Federal [1]**	**County [2]**
Short-Range Projects (within 5 years) [3]				
S1	Install Chain Link Fencing and Automatic Gates (Phase II)	$200,000	$180,000	$20,000
S2	Pavement Maintenance, South Hangar Area	$570,000	$513,000	$57,000
S3	Construct Hangar Access Road	$480,000	$432,000	$48,000
S4	Taxiway B Extension	$160,000	$144,000	$16,000
S5	Construct T-Hangar Taxilane / Relocate Gravel Road	$130,000	$117,000	$13,000
S6	Drainage Improvements (Phase I)	$2,500,000	$2,250,000	$250,000
S7	Land Acquisition	$2,000,000	$1,800,000	$200,000
S8	Runway 14-32 Seal Coat and Marking	$350,000	$315,000	$35,000
S9	Pavement Maintenance, South Apron	$440,000	$396,000	$44,000
S10	Land Acquisition	$2,000,000	$1,800,000	$200,000
	Subtotal	***$8,830,000***	***$7,947,000***	***$883,000***
Mid-Range Projects (approximately 5 to 10 years)				
M1	Drainage Improvements (Phase II)	$1,250,000	$1,125,000	$125,000
M2	Construct Primary Access Road Extension/Remove Buildings	$2,400,000	$2,160,000	$240,000
M3	Construct Corporate Hangar Area Access Road Extension	$450,000	$405,000	$45,000
M4	Construct Taxiway A Extension, Runway 32 Entrance Taxiway	$1,600,000	$1,440,000	$160,000
M5	Construct Corporate Area Taxilane	$180,000	$162,000	$18,000
M6	Construct GA Apron and T-Hangar Taxilane	$470,000	$423,000	$47,000
M7	Install Chain Link Fencing (Phase III)	$90,000	$81,000	$9,000
M8	Pavement Maintenance, General	$650,000	$585,000	$65,000
	Subtotal	***$7,090,000***	***$6,381,000***	***$709,000***
Long-Range Projects (10 to 20 years)				
L1	Construct Runway 32 Extension, Runup Areas & Blast Pad	$4,400,000	$3,960,000	$440,000
L2	Reconstruct (2) Taxiway Exits and Taxiway Fillets	$1,000,000	$900,000	$100,000
L3	Core Area Redevelopment/Terminal Road Realignment	$1,600,000	$1,440,000	$160,000
L4	Construct Tiedown Apron and Taxilane	$900,000	$810,000	$90,000
	Subtotal	***$7,900,000***	***$7,110,000***	***$790,000***
	TOTAL	***$23,820,000***	***$21,438,000***	***$2,382,000***

Notes:
1. Federal share assumed to be set at 90% throughout the planning period; all listed projects are currently grant eligible.
2. Most projects listed are eligible for state share currently equal to 2.5% of the federal share, but state participation is dependent upon state funding availability and project prioritization.
3. Projects within each time range are not necessarily in priority order.

Source: Mead & Hunt, Inc. (April 2008)

Table 5A

Capital Improvement Program

Yuba County Airport

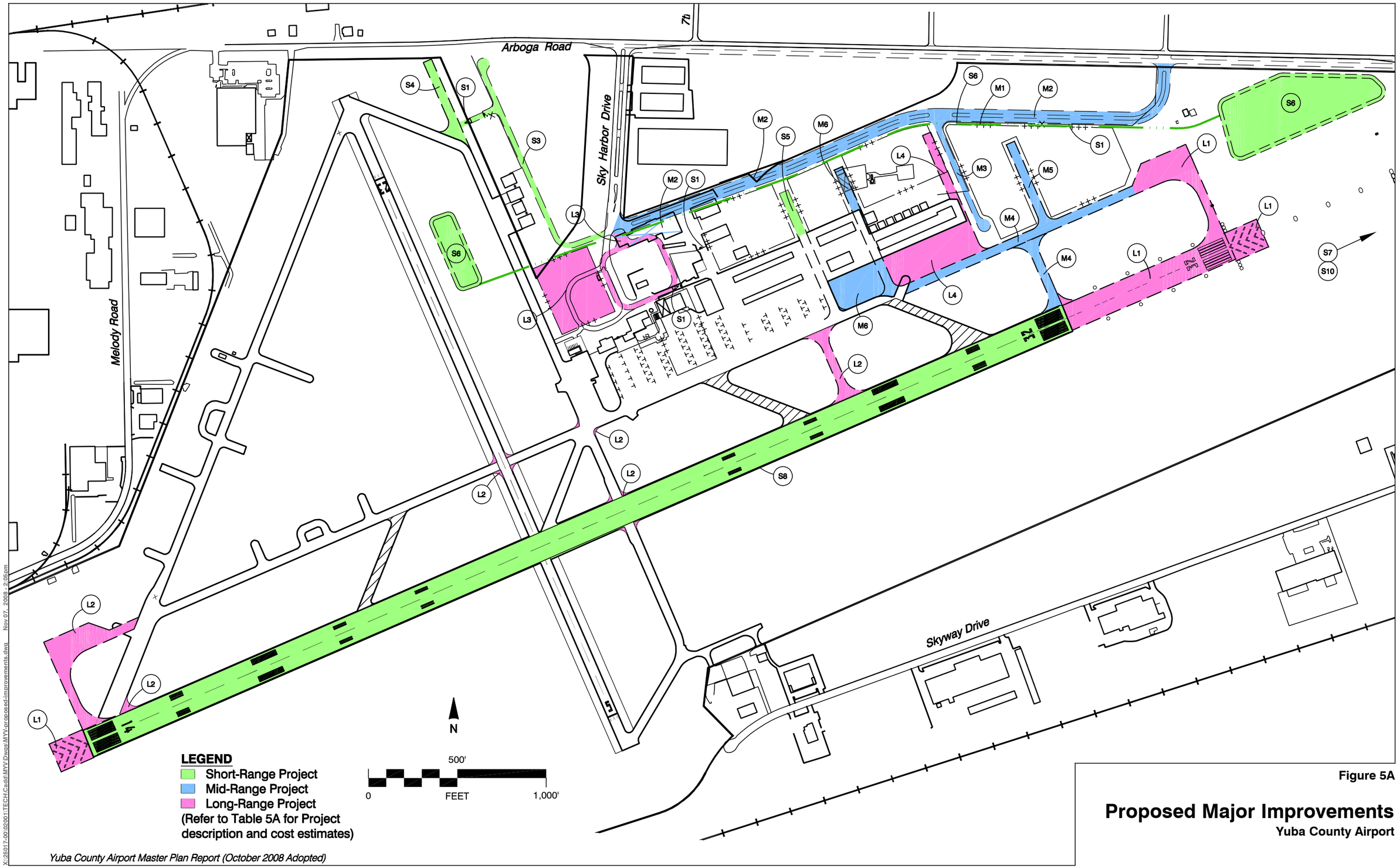


Figure 5A

Proposed Major Improvements

Yuba County Airport

Appendices

Appendix A

Glossary of Terms

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

AIR CARRIER: A person who undertakes directly by lease, or other arrangement, to engage in air transportation. (FAR 1) (Also see Certificated Air Carrier)

AIR CARRIERS: The commercial system of air transportation, consisting of the certificated air carriers, air taxis (including commuters), supplemental air carriers, commercial operators of large aircraft, and air travel clubs. (FAA Census)

AIR ROUTE TRAFFIC CONTROL CENTER (ARTCC): A facility established to provide air traffic control service to aircraft operating on IFR flight plans within controlled airspace, principally during the en route phase of flight. When equipment capabilities and controller workload permit, certain advisory/assistance services may be provided to VFR aircraft. (AIM)

AIR TAXI: A classification of air carriers which directly engage in the air transportation of persons, property, mail, or in any combination of such transportation and which do not directly or indirectly utilize large aircraft (over 30 seats or a maximum payload capacity of more than 7,500 pounds) and do not hold a Certificate of Public Convenience and Necessity or economic authority issued by the Department of Transportation. (Also see commuter air carrier and demand air taxi.) (FAA Census)

AIR TRAFFIC CONTROL (ATC): A service operated by appropriate authority to promote the safe, orderly, and expeditious flow of air traffic. (FAR 1)

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 and all such persons have disembarked, and in which any person suffers death or serious injury, or in which the aircraft receives substantial damage. (NTSB)

AIRCRAFT APPROACH CATEGORY: A grouping of aircraft (Categories A–E) based on 1.3 times their stall speed in their landing configuration at their maximum certificated landing weight. (Airport Design)

AIRCRAFT OPERATION: The airborne movement of aircraft in controlled or non-controlled airport terminal areas and about given en route fixes or at other points where counts can be made. There are two types of operations — local and itinerant. (FAA Stats)

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

AIR/FIRE ATTACK BASE: An established on-airport base of operations for the purposes of aerial suppression of large-scale fires by specially-modified aircraft. Typically, such aircraft are operated by the California Department of Forestry and/or the U.S. Forest Service.

AIRPLANE DESIGN GROUP: A grouping of airplanes (Groups I–V) based on wingspan. (Airport Design)

AIRPORT: An area of land or water that is used or intended to be used for the landing and takeoff of aircraft, and includes its buildings and facilities, if any. (FAR 1)

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

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 in landing or taking off at the airport or is otherwise hazardous to aircraft landing, taking off, or taxiing at the airport. (Airport Design)

AIRPORT LAND USE COMMISSION (ALUC): A commission established in accordance with the California State Aeronautics Act in each county having an airport operated for the benefit of the general public. The purpose of each ALUC is "to assist local agencies in ensuring compatibility land uses in the vicinity of all new airports and in the vicinity of existing airports to the extent that the land in the vicinity of those airports is not already devoted to incompatible uses." An ALUC need not be created if an alternative process, as specified by the statutes, is established to accomplish the same purpose. (California Public Utilities Code, Section 21670 et seq.)

AIRPORT LAYOUT PLAN (ALP): A scale drawing of existing and proposed airport facilities, their location on the airport, and the pertinent clearance and dimensional information required to demonstrate conformance with applicable standards.

AIRPORT REFERENCE CODE (ARC): A coding system used to relate airport design criteria to the operational and physical characteristics of the airplanes intended to operate at the airport. (Airport Design)

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

AIRPORT TRAFFIC CONTROL TOWER (ATCT): A terminal facility that uses air/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. (AIM)

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. (AIM)

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

APPROACH LIGHT SYSTEM (ALS): An airport lighting system which provides visual guidance to landing aircraft by radiating light beams in a directional pattern by which the pilot aligns the aircraft with the extended runway centerline during a final approach to landing. Among the specific types of systems are:

- **LDIN—**Lead-in Light System.
- **MALSR—**Medium-intensity Approach Light System with Runway Alignment Indicator Lights.
- **ODALS—**Omnidirectional Approach Light System, a combination of LDIN and REILS.
- **SSALR—**Simplified Short Approach Light System with Runway Alignment Indicator Lights. (AIM)

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. (AIM)

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 in some applications, via telephone.

AUTOMATIC DIRECTION FINDER (ADF): An aircraft radio navigation system which senses and indicates the direction to a L/MF nondirectional radio beacon (NDB) ground transmitter. (AIM)

AUTOMATIC TERMINAL INFORMATION SERVICE (ATIS): The continuous broadcast of recorded non-control information in selected terminal areas. (AIM)

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

BALANCED FIELD LENGTH: The runway length at which the distance required for a given aircraft to abort a takeoff and stop on the runway (accelerate-stop distance) equals the distance required to continue the takeoff and reach a height of 35 feet above the runway end (accelerate-go distance).

BASED AIRCRAFT: Aircraft stationed at an airport on a long-term basis.

BUILDING RESTRICTION LINE (BRL): A line which identifies suitable building area locations on airports.

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 is not classified as "thin" or "partial". (AIM)

CERTIFICATED ROUTE AIR CARRIER: An air carrier holding a Certificate of Public Convenience and Necessity issued by the Department of Transportation authorizing the performance of scheduled service over specified routes, and a limited amount of nonscheduled service. (FAA Census)

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 is not desirable. (AIM)

COMMERCIAL OPERATOR: A person who, for compensation or hire, engages in the carriage by aircraft in air commerce of persons or property, other than as an air carrier. (FAR 1)

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

COMPASS ROSE: A circle, graduated in degrees, printed on some charts or marked on the ground at an airport. It is used as a reference to either true or magnetic direction. (AIM)

COMMUNITY NOISE EQUIVALENT LEVEL (CNEL): The noise rating adopted by the State of California for measurement of airport noise. It represents the average daytime noise level during a 24-hour day, measured in decibels and adjusted to an equivalent level to account for the lower tolerance of people to noise during evening and nighttime periods.

COMMUTER AIR CARRIER: An air taxi operator which 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. (FAA Census)

CONTROLLED AIRSPACE: A generic term that covers the different classifications of airspace (Class A, Class B, Class C, Class D and Class E airspace) and defines dimensions within which air traffic control service is provided to IFR flights and to VFR flights in accordance with the airspace classification. Controlled airspace in the United States is designated as follows:

- **Class A—**Generally, that airspace from 18,000 feet MSL up to and including 60,000 feet MSL (Flight Level 600), including the airspace overlying the waters within 12 nautical miles of the coast of the 48 contiguous states and Alaska. Unless otherwise authorized, all persons must operate their aircraft under IFR.
- **Class B—**Generally, that airspace from the surface to 10,000 feet MSL surrounding the nation's busiest airports in terms of airport operations or passenger enplanements. The configuration of each Class B airspace area is individually tailored and consists of a surface area and two or more layers (some Class B airspaces areas resemble upside-down wedding cakes), and is designed to contain all published instrument procedures once an aircraft enters the airspace. An ATC clearance is required for all aircraft to operate in the area, and all aircraft that are so cleared receive separation services within the airspace. The cloud clearance requirement for VFR operations is "clear of clouds".
- **Class C—**Generally, that airspace from the surface to 4,000 feet above the airport elevation (charted in MSL) surrounding those airports that have an operational control tower, are serviced by radar approach control, and that have a certain number of IFR operations or passenger enplanements. Although the configuration of each Class C airspace area is individually tailored, the airspace usually consists of a surface area with a 5 nm radius, and an outer area with a 10 nm radius that extends from 1,200 feet to 4,000 feet above the airport elevation. Each person must establish two-way radio communications with the ATC facility providing air traffic services prior to entering the airspace and thereafter maintain those communications while within the airspace. VFR aircraft are only separated from IFR aircraft within the airspace.
- **Class D—**Generally, that airspace from the surface to 2,500 feet above the airport elevation (chartered in MSL) surrounding those airports that have an operational control tower. The configuration of each Class D airspace area is individually tailored and when instrument procedures are published, the airspace will normally be designed to contain the procedures. Arrival extensions for instrument approach procedures may be Class D or Class E airspace. Unless otherwise authorized, each person must establish two-way radio communications with the ATC facility providing air traffic services prior to entering the airspace and thereafter maintain those communications while in the airspace. No separation services are provided to VFR aircraft.

- **Class E—**Generally, if the airspace is not Class A, Class B, Class C, or Class D, and it is controlled airspace, it is Class E airspace. Class E airspace extends upward from either the surface or a designated altitude to the overlying or adjacent controlled airspace. When designated as a surface area, the airspace will be configured to contain all instrument procedures. Also in this class are Federal airways, airspace beginning at either 700 or 1,200 feet AGL used to transition to/from the terminal or en route environment, en route domestic, and offshore airspace areas designated below 18,000 feet MSL. Unless designated at a lower altitude, Class E airspace begins at 14,500 MSL over the United States, including that airspace overlying the waters within 12 nautical miles of the coast of the 48 contiguous States and Alaska. Class E airspace does not include the airspace 18,000 feet MSL or above.

DEMAND AIR TAXI: Use of an aircraft operating under Federal Aviation Regulations, Part 135, passenger and cargo operations, including charter and excluding commuter air carrier. (FAA Census)

DISPLACED THRESHOLD: A threshold that is located at a point on the runway other than the designated beginning of the runway. (AIM)

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. (AIM)

FAR PART 77: The part of the Federal Aviation Regulations that deals with objects affecting 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.

FEDERAL AVIATION ADMINISTRATION (FAA): The United States government agency that is responsible for insuring the safe and efficient use of the nation's airspace.

FIXED BASE OPERATOR (FBO): 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 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, aerial hoists, or pipeline patrol.

FLIGHT SERVICE STATION (FSS): FAA facilities which provide pilot briefings on weather, airports, altitudes, routes, and other flight planning information.

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: That portion of civil aviation which encompasses all facets of aviation except air carriers. (FAA Stats)

GENERIC VISUAL GLIDE SLOPE INDICATOR (GVGI): A generic term for the group of airport visual landing aids which includes Visual Approach Slope Indicators (VASI), Precision Approach Path Indicators (PAPI), and Pulsed Light Approach Slope Indicators (PLASI). When FAA funding pays for this equipment, whichever type receives the lowest bid price will be installed unless the airport owner wishes to pay the difference for a more expensive unit.

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

GLOBAL POSITIONING SYSTEM (GPS): A relatively new navigational system which utilizes a network of satellites to determine a positional fix almost anywhere on or above the earth. Developed and operated by the U.S. Department of Defense, GPS has been made available to the civilian sector for surface, marine, and aerial navigational use. For aviation purposes, the current form of GPS guidance provides en route aerial navigation and selected types of nonprecision instrument approaches. Eventual application of GPS as the principal system of navigational guidance throughout the world is anticipated.

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. (AIM)

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. (AIM)

INSTRUMENT FLIGHT RULES (IFR): Rules governing the procedures for conducting instrument flight. Also term used by pilots and controllers to indicate a type of flight plan. (AIM)

INSTRUMENT LANDING SYSTEM (ILS): A precision instrument approach system which normally consists of the following electronic components and visual aids: (1) Localizer; (2) Glide Slope; (3) Outer Marker; (4) Middle Marker; (5) Approach Lights. (AIM)

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 control facility. (FAA ATA)

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

ITINERANT OPERATION: An arrival or departure performed by an aircraft from or to a point beyond the local airport area.

LARGE AIRCRAFT: An aircraft of more than 12,500 pounds maximum certificated takeoff weight. (FAR 1)

LIMITED REMOTE COMMUNICATIONS OUTLET (LRCO): An unmanned, remote air/ground communications facility which may be associated with a VOR. It is capable only of receiving communications and relies on a VOR or a remote transmitter for full capability.

LOCALIZER (LOC): The component of an ILS which provides course guidance to the runway. (AIM)

LOCAL OPERATION: An arrival or departure performed by an aircraft: (1) operating in the traffic pattern, (2) known to be departing or arriving from flight in local practice areas, or (3) executing practice instrument approaches at the airport. (FAA ATA)

LORAN: An electronic ground-based navigational system established primarily for marine use but used extensively for VFR and limited IFR air navigation.

MARKER BEACON (MB): The component of an ILS which informs pilots, both aurally and visually, that they are at a significant point on the approach course.

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

MEDIUM-INTENSITY APPROACH LIGHTING SYSTEM (MALS): The MALS is a configuration of steady-burning lights arranged symmetrically about and along the extended runway centerline. MALS may also be installed with sequenced flashers in this case, the system is referred to as MALSF.

MILITARY OPERATIONS AREA (MOA): A type of special use airspace of defined vertical and lateral dimensions established outside of Class A airspace to separate/segregate certain military activities from IFR traffic and to identify for VFR traffic where these activities are conducted. (AIM)

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. (FAR 1)

MISSED APPROACH: A maneuver conducted by a pilot when an instrument approach cannot be completed to a landing. (AIM)

NAVIGATIONAL AID/NAVAID: Any visual or electronic device airborne or on the surface which provides point-to-point guidance information or position data to aircraft in flight. (AIM)

NONDIRECTIONAL BEACON (NDB): A 4 MF or UHF radio beacon transmitting nondirectional 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. (AIM)

NONPRECISION APPROACH PROCEDURE: A standard instrument approach procedure in which no electronic glide slope is provided. (FAR 1)

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 nonprecision instrument approach procedure has been approved or planned, and no precision approach facility or procedure is planned. (Airport Design)

OBJECT FREE AREA (OFA): A surface surrounding runways, taxiways, and taxilanes which should be clear of parked airplanes and objects except for objects that need to be located in the OFA for air navigation or aircraft ground maneuvering purposes. (Airport Design)

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. (AIM)

OBSTACLE FREE ZONE (OFZ): A defined volume of airspace 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/obstacle, including a mobile object, exceeding the obstruction standards specified in FAR Part 77, Subpart C. (AIM)

OUTER MARKER: A marker beacon at or near the glide slope intercept position of an ILS approach. (AIM)

PRECISION APPROACH PATH INDICATOR (PAPI): An airport visual 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 glide slope is provided, such as an ILS or PAR. (FAR 1)

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

RELOCATED THRESHOLD: The portion of pavement behind a relocated threshold that is not available for takeoff and landing. It may be available for taxiing and aircraft. (Airport Design)

REMOTE COMMUNICATIONS AIR/GROUND FACILITY (RCAG): An unmanned VHF/UHF transmitter/receiver facility which is used to expand ARTCC air/ground communications coverage and to facilitate direct contact between pilots and controllers. (AIM)

REMOTE COMMUNICATIONS OUTLET (RCO) AND REMOTE TRANSMITTER/ RECEIVER (RTR): An unmanned communications facility remotely controlled by air traffic personnel. RCO's serve FSS's. RTR's serve terminal ATC facilities. (AIM)

RESTRICTED AREA: Designated airspace within which the flight of aircraft, while not wholly prohibited, is subject to restriction. (FAR 1)

RUNWAY CLEAR ZONE: A term previously used to describe the runway protection zone.

RUNWAY EDGE LIGHTS: Lights used to define the lateral limits of a runway. Specific types include:

- **HIRL—**High-Intensity Runway Lights.
- **MIRL—**Medium-Intensity Runway Lights.

RUNWAY END IDENTIFIER LIGHTS (REIL): 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. (AIM)

RUNWAY PROTECTION ZONE (RPZ): A trapezoidal shaped area at the end of a runway, the function of which is to enhance the protection of people and property on the ground through airport owner control of the land. The RPZ usually begins at the end of each primary surface and is centered upon the extended runway centerline. (Airport Design)

RUNWAY SAFETY AREA (RSA): A defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the even of an undershoot, overshoot, or excursion from the runway. (Airport Design)

SMALL AIRCRAFT: An aircraft of 12,500 pounds or less maximum certificated takeoff weight. (FAR 1)

SPECIAL USE AIRSPACE: Airspace of defined horizontal and vertical dimensions identified by an area on the surface of the earth 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. (AIM)

STANDARD INSTRUMENT DEPARTURE (SID): A preplanned instrument flight rules (IFR) air traffic control departure procedure printed for pilot use in graphic and/or textual form. SID's provide transition from the terminal to the appropriate en route structure. (AIM)

STANDARD TERMINAL ARRIVAL ROUTE (STAR): A preplanned instrument flight rule (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. (AIM)

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 airplane during an aborted takeoff, without causing structural damage to the airplane, and designated by the airport authorities for use in decelerating the airplane during an aborted takeoff. (FAR 1)

STRAIGHT-IN INSTRUMENT APPROACH — IFR: 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 minimums. (AIM)

TAXILANE: The portion of the aircraft parking area used for access between taxiways, aircraft parking positions, hangars, storage facilities, etc. (Airport Design)

TAXIWAY: A defined path, from one part of an airport to another, selected or prepared for the taxiing of aircraft. (Airport Design)

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: precision approach, nonprecision approach, circling, and departure.

TERMINAL RADAR SERVICE AREA (TRSA): Airspace surrounding designated airports wherein ATC provides radar vectoring, sequencing, and separation on a full-time basis for all IFR and participating VFR aircraft. (AIM)

THRESHOLD: The beginning of that portion of the runway usable for landing. (AIM)

TOUCH-AND-GO: An operation by an aircraft that lands and departs on a runway without stopping or exiting the runway. A touch-and-go is defined as two operations. (AIM)

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. (AIM)

TRANSIENT AIRCRAFT: Aircraft not based at the airport.

TRANSMISSOMETER: An apparatus used to determine visibility by measuring the transmission of light through the atmosphere. (AIM)

UNCONTROLLED AIRSPACE: Now known as Class G airspace. Class G airspace is that portion of the airspace that has not been designated as Class A, Class B, Class C, Class D, and Class E airspace.

UNICOM (Aeronautical Advisory Station): A nongovernment air/ground radio communication facility which may provide airport information at certain airports. (AIM)

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

VISUAL APPROACH SLOPE INDICATOR (VASI): An airport landing aid which provides a pilot with visual descent (approach slope) guidance while on approach to landing. Also see PAPI.

VISUAL FLIGHT RULES (VFR): Rules that govern the procedures for conducting flight under visual conditions. The term "VFR" is also used by pilots and controllers to indicate type of flight plan. (AIM)

VISUAL GLIDE SLOPE INDICATOR (VGSI): A generic term for the group of airport visual landing aids which includes Visual Approach Slope Indicators (VASI), Precision Approach Path Indicators (PAPI), and Pulsed Light Approach Slope Indicators (PLASI). When FAA funding pays for this equipment, whichever type receives the lowest bid price will be installed unless the airport owner wishes to pay the difference for a more expensive unit.

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. (Airport Design)

WARNING AREA: A type of special use airspace which may contain hazards to nonparticipating aircraft in international airspace. (AIM)

SOURCES

FAR 1: Federal Aviation Regulations Part 1, Definitions and Abbreviations. (1993)

AIM: Airman's Information Manual, Pilot/Controller Glossary. (1993)

Airport Design: Federal Aviation Administration. *Airport Design*. Advisory Circular 150/5300-13, Change 7. (2002)

FAA ATA: Federal Aviation Administration. *Air Traffic Activity*. (1986)

FAA Census: Federal Aviation Administration. *Census of U.S. Civil Aircraft*. (1986)

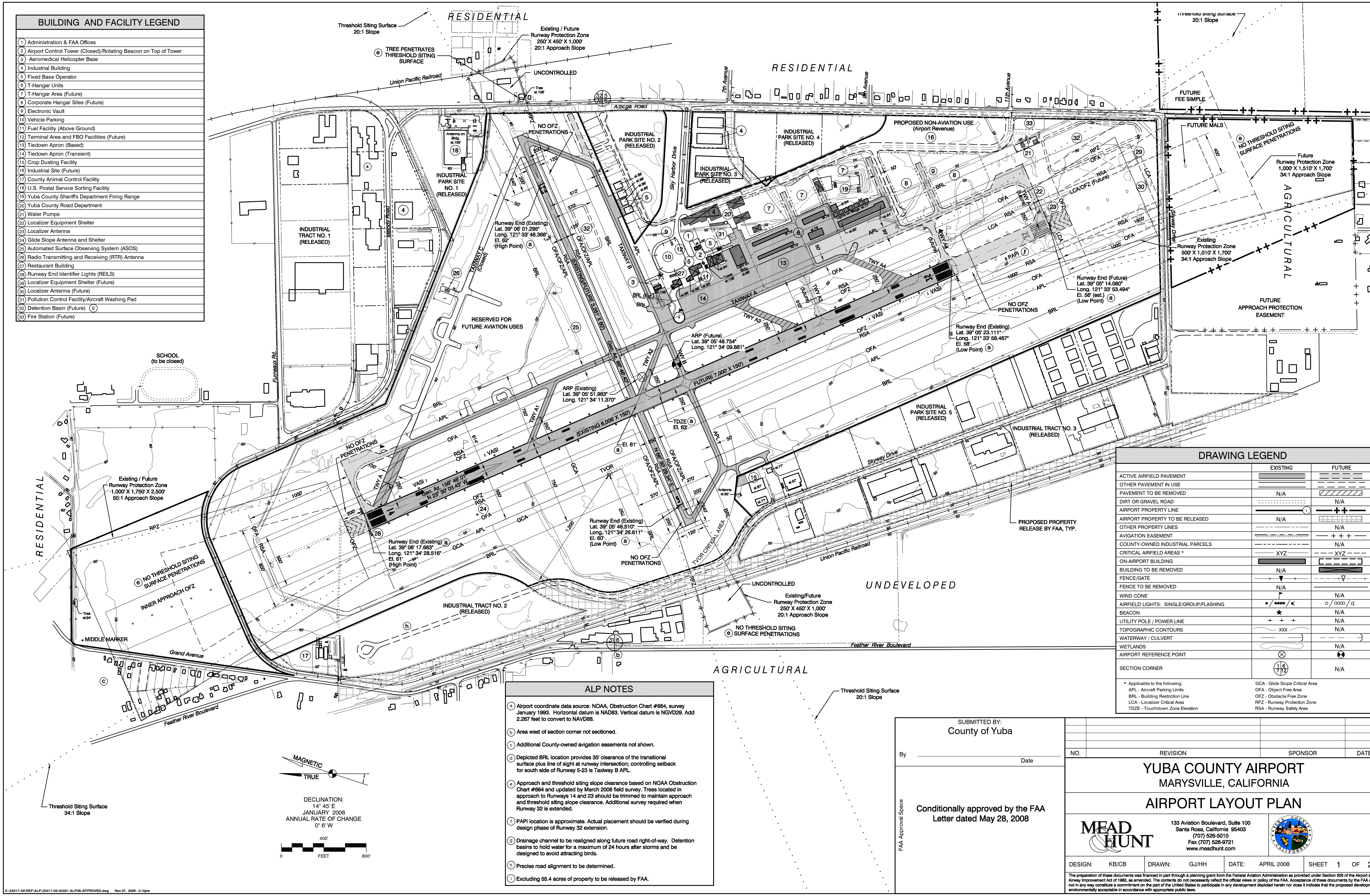
FAA Stats: Federal Aviation Administration. *Statistical Handbook of Aviation*. (1984)

NTSB: National Transportation Safety Board. *U.S. NTSB 830-3*. (1

Airport Plan Drawings

BUILDING AND FACILITY LEGEND

No.	Facility
1	Administration & FAA Offices
2	Airport Control Tower (Closed)/Rotating Beacon on Top of Tower
3	Aeromedical Helicopter Base
4	Industrial Building
5	Fixed Base Operator
6	T-Hangar Units
7	T-Hangar Area (Future)
8	Corporate Hangar Sites (Future)
9	Electronic Vault
10	Vehicle Parking
11	Fuel Facility (Above Ground)
12	Terminal Area and FBO Facilities (Future)
13	Tiedown Apron (Based)
14	Tiedown Apron (Transient)
15	Crop Dusting Facility
16	Industrial Site (Future)
17	County Animal Control Facility
18	U.S. Postal Service Sorting Facility
19	Yuba County Sheriff's Department Firing Range
20	Yuba County Road Department
21	Water Pumps
22	Localizer Equipment Shelter
23	Localizer Antenna
24	Glide Slope Antenna and Shelter
25	Automated Surface Observing System (ASOS)
26	Radio Transmitting and Receiving (RTR) Antenna
27	Restaurant Building
28	Runway End Identifier Lights (REILS)
29	Localizer Equipment Shelter (Future)
30	Localizer Antenna (Future)
31	Pollution Control Facility/Aircraft Washing Pad
32	Detention Basin (Future) (g)
33	Fire Station (Future)



DRAWING LEGEND

	EXISTING	FUTURE
ACTIVE AIRFIELD PAVEMENT		
OTHER PAVEMENT IN USE		
PAVEMENT TO BE REMOVED	N/A	
DIRT OR GRAVEL ROAD		N/A
AIRPORT PROPERTY LINE	(i)	
AIRPORT PROPERTY TO BE RELEASED	N/A	
OTHER PROPERTY LINES		N/A
AVIGATION EASEMENT		
COUNTY-OWNED INDUSTRIAL PARCELS		N/A
CRITICAL AIRFIELD AREAS *	XYZ	XYZ
ON-AIRPORT BUILDING		
BUILDING TO BE REMOVED	N/A	
FENCE/GATE		
FENCE TO BE REMOVED	N/A	
WIND CONE		N/A
AIRFIELD LIGHTS: SINGLE/GROUP/FLASHING		
BEACON	★	N/A
UTILITY POLE / POWER LINE		N/A
TOPOGRAPHIC CONTOURS	XXX	N/A
WATERWAY / CULVERT		
WETLANDS		N/A
AIRPORT REFERENCE POINT	⊗	
SECTION CORNER	1 6 / 7 12	N/A

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

ALP NOTES

(a) Airport coordinate data source: NOAA, Obstruction Chart #664, survey January 1993. Horizontal datum is NAD83. Vertical datum is NGVD29. Add 2.267 feet to convert to NAVD88.

(b) Area west of section corner not sectioned.

(c) Additional County-owned avigation easements not shown.

(d) Depicted BRL location provides 35' clearance of the transitional surface plus line of sight at runway intersection; controlling setback for south side of Runway 5-23 is Taxiway B APL.

(e) Approach and threshold siting slope clearance based on NOAA Obstruction Chart #664 and updated by March 2008 field survey. Trees located in approach to Runways 14 and 23 should be trimmed to maintain approach and threshold siting slope clearance. Additional survey required when Runway 32 is extended.

(f) PAPI location is approximate. Actual placement should be verified during design phase of Runway 32 extension.

(g) Drainage channel to be realigned along future road right-of-way. Detention basins to hold water for a maximum of 24 hours after storms and be designed to avoid attracting birds.

(h) Precise road alignment to be determined.

(i) Excluding 55.4 acres of property to be released by FAA.

SUBMITTED BY:
County of Yuba

By ____________________ Date

FAA Approval Space

Conditionally approved by the FAA
Letter dated May 28, 2008

NO.	REVISION	SPONSOR	DATE

YUBA COUNTY AIRPORT
MARYSVILLE, CALIFORNIA
AIRPORT LAYOUT PLAN

MEAD & HUNT
133 Aviation Boulevard, Suite 100
Santa Rosa, California 95403
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Fax (707) 526-9721
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DESIGN: KB/CB | DRAWN: GJ/HH | DATE: APRIL 2008 | SHEET 1 OF 2

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 depicted herein nor does it indicate that the proposed development is environmentally acceptable in accordance with appropriate public laws.

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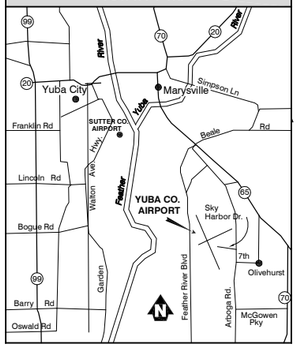
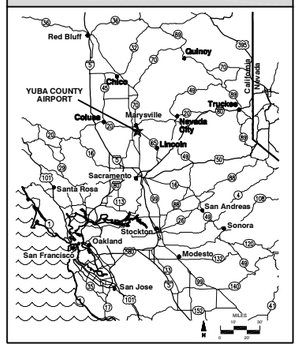
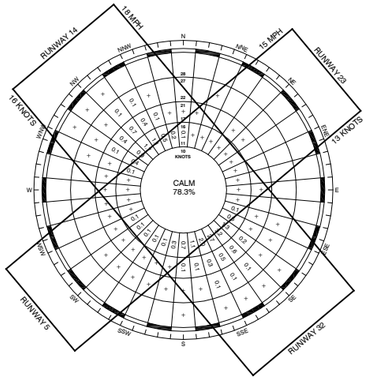
VICINITY MAP



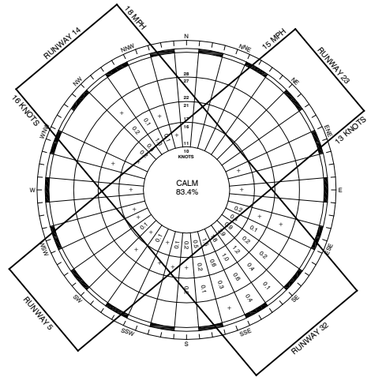
LOCATION MAP



ALL WEATHER CONDITIONS



IFR CONDITIONS



ALL WEATHER WIND COVERAGE

Runway	12 M.P.H. (10.5 Knots)	15 M.P.H. (13 Knots)	18 M.P.H. (16 Knots)
5-23	80.45%	86.99%	-
14-32	98.89%	99.53%	99.88%
Combined	99.65%	99.92%	-

IFR WIND COVERAGE

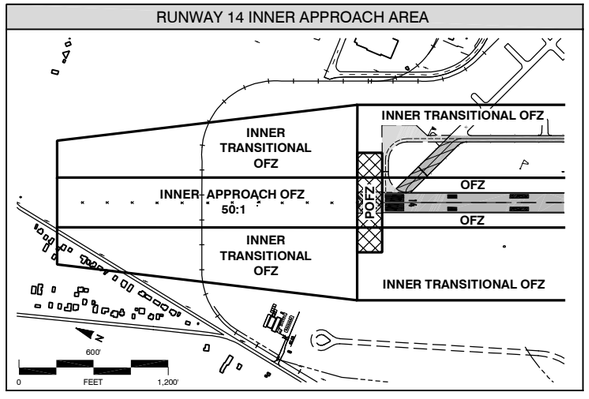
Runway	15 M.P.H. (13 Knots)	18 M.P.H. (16 Knots)
5-23	88.20%	-
14-32	99.41%	99.81%
Combined	99.73%	-

Source: National Climatic Data Center (NCDC). Period: January 1992 to December 2001. IFR Observations: 53,348. All Weather Observations: 53,869.

RUNWAY END DATA

APPROACH END OF RUNWAY:			5	23	14	32
RUNWAY END COORDINATES (a)	Latitude	Existing	39° 05' 48.510"	39° 06' 01.295"	39° 06' 17.663"	39° 05' 23.111"
		Future	No Change	No Change	No Change	39° 05' 14.080"
	Longitude	Existing	121° 34' 26.611"	121° 33' 48.366"	121° 34' 28.516"	121° 33' 58.467"
		Future	No Change	No Change	No Change	121° 33' 53.494"
RUNWAY END ELEVATIONS (a)		Existing	60'	62'	61'	58'
		Future	No Change	No Change	No Change	56' (est.)
RUNWAY TDZE (a)		Existing	N/A		61'	
		Future	No Change		No Change	
NAVIGATION AIDS		Existing	None	None	ILS/VOR/GPS	GPS/VOR
		Future	No Change	No Change	No Change	No Change
VISUAL AIDS		Existing	None	None	**MALSR/REIL/VASI**	VASI
		Future	No Change	No Change	No Change	No Change
APPROACH TYPE [FAR Part 77 Category]		Existing	Visual [A(V)]	Visual [A(V)]	Precision [(PIR)]	**Nonprecision [C(NP)]**
		Future	No Change	No Change	No Change	No Change
APPROACH VISIBILITY (Minimums)		Existing	Visual	Visual	1/2 Mile	1 Mile
		Future	No Change	No Change	No Change	No Change
APPROACH SLOPE (b) (Required/Clear)		Existing	20:1/>20:1	20:1/17:1	50:1/40:1	34:1/>34:1
		Future	No Change	20:1/20:1	No Change	No Change
RUNWAY SAFETY AREA (Width)		Existing	120'		500'	
		Future	No Change		No Change	
RUNWAY SAFETY AREA (Length Beyond Runway End)		Existing	240'	240'	1,000'	1,000'
		Future	No Change	No Change	No Change	No Change
OBSTACLE FREE ZONE (Width)		Existing	250'		400'	
		Future	No Change		No Change	
OBSTACLE FREE ZONE (Length Beyond Runway End)		Existing	200'	200'	2,600'	2,600'
		Future	No Change	No Change	No Change	No Change
OBJECT FREE AREA (Width)		Existing	250'		800'	
		Future	No Change		No Change	
OBJECT FREE AREA (Length Beyond Runway End)		Existing	240'	240'	1,000'	1,000'
		Future	No Change	No Change	No Change	No Change
DISTANCE FROM RWY ℄ TO HOLD BARS		Existing	200'		250'	
		Future	No Change		No Change	

RUNWAY 14 INNER APPROACH AREA



DATA SHEET NOTES

(a) Airport coordinate data source: NOAA, Obstruction Chart #664, survey January 1993. Horizontal datum is NAD83. Vertical datum is NGVD29. Add 2.267 feet to convert to NAVD88.

(b) Approach and threshold siting slope clearance based on NOAA Obstruction Chart #664 and updated by March 2008 field survey. Trees located in approach to Runways 14 and 23 should be trimmed to maintain approach and threshold siting slope clearance. Additional survey required when Runway 32 is extended.

(c) After FAA property release pending in 2008.

AIRPORT DATA

		EXISTING	FUTURE
AIRPORT SERVICE LEVEL (NPIAS)		General Aviation	No Change
AIRPORT REFERENCE POINT (a)	Latitude	39° 05' 51.983"	39° 05' 48.754"
	Longitude	121° 34' 11.370"	121° 34' 09.881"
AIRPORT ELEVATION (Above Mean Sea Level) (a)		62'	No Change
MEAN MAX. TEMP. (Hottest Month)		96.3° (July)	No Change
AIRPORT AND TERMINAL NAVIGATIONAL AIDS		ILS/VOR/GPS	No Change
GPS APPROACH ESTABLISHED		Yes	No Change
AIRPORT ACREAGE	Fee Simple	605 (c)	743
	Avigation Easement	319	358
AIRCRAFT PARKING SPACES	Tiedowns	77±	No Change
	Hangar Units	93±	250±

RUNWAY DATA

		RUNWAY 5-23		RUNWAY 14-32	
		EXISTING	FUTURE	EXISTING	FUTURE
AIRCRAFT REFERENCE CODE		B-I (small)	No Change	C-III	No Change
CRITICAL AIRCRAFT	AIRCRAFT	Beech Baron	No Change	Cessna Citation III	Gulfstream IV
	WINGSPAN (ft.)	37.8	No Change	53.5	77.8
	APPROACH SPEED (kts.)	101	No Change	114	145
	MAX. TAKEOFF WT. (lbs.)	6,200	No Change	22,000	71,780
PHYSICAL LENGTH AND WIDTH		3,281' x 60'	No Change	6,006' x 150'	7,000' x 150'
VERTICAL LINE OF SIGHT PROVIDED		Yes	No Change	Yes	No Change
EFFECTIVE GRADIENT (%)		0.06	No Change	0.05	0.04 (est.)
MAXIMUM GRADIENT (%)		0.36	No Change	0.10	0.20 (est.)
RUNWAY/TAXIWAY SURFACE TYPE		Asphalt/Asphalt	No Change	Asphalt/Asphalt	No Change
PAVEMENT STRENGTH (1,000#) - S/D/DT		42/60/95	No Change	75/100/150	No Change
RUNWAY MARKING		Visual	No Change	Precision	No Change
RUNWAY LIGHTING		None	No Change	HIRL	No Change

NO.	REVISION	SPONSOR	DATE

YUBA COUNTY AIRPORT
MARYSVILLE, CALIFORNIA

DATA SHEET

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